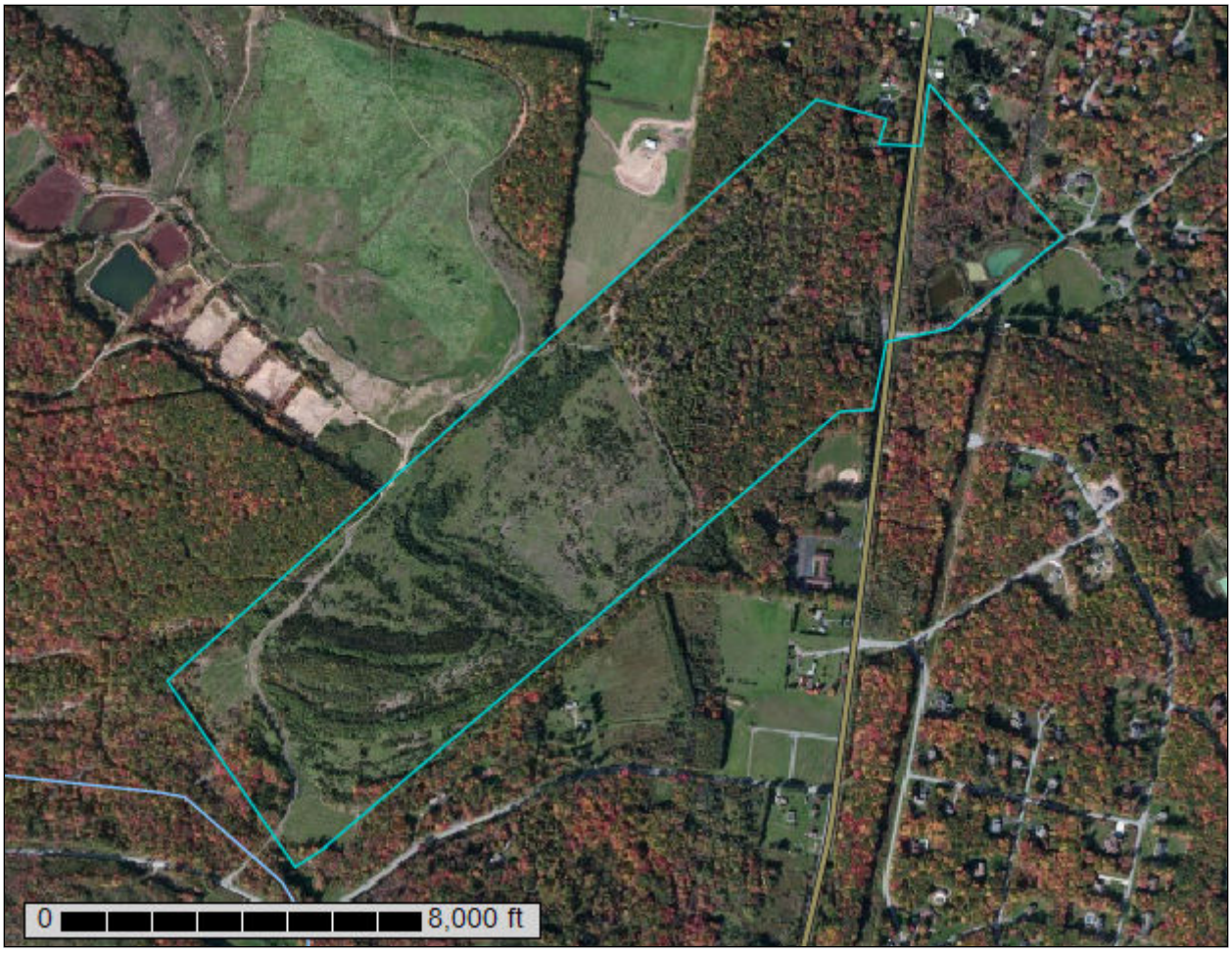
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Centre County, Pennsylvania




December 13, 2017

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# Contents

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Centre County, Pennsylvania
Survey Area Data: Version 16, Nov 27, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 6, 2011—Oct 17, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| BrB | Brinkerton silt loam, 3 to 8 percent slopes | 6.5 | 4.2% |
| CdB | Cavode silt loam, 3 to 8 percent slopes | 6.2 | 4.0% |
| ClB | Clymer sandy loam, 3 to 8 percent slopes | 0.2 | 0.1% |
| HhB | Hazleton channery sandy loam, 3 to 8 percent slopes | 19.7 | 12.7% |
| HhC | Hazleton channery sandy loam, 8 to 15 percent slopes | 7.6 | 4.9% |
| HSD | Hazleton extremely stony sandy loam, moderately steep | 0.0 | 0.0% |
| Sm | Strip mines, acid | 90.5 | 58.4% |
| VrF | Varilla-Laidig complex, 25 to 60 percent slopes, very rubbly | 1.5 | 0.9% |
| WhB | Wharton silt loam, 3 to 8 percent slopes | 23.0 | 14.8% |
| **Totals for Area of Interest** | | **155.1** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Centre County, Pennsylvania

## BrB—Brinkerton silt loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* l22x
*Elevation:* 300 to 3,000 feet
*Mean annual precipitation:* 30 to 65 inches
*Mean annual air temperature:* 46 to 59 degrees F
*Frost-free period:* 120 to 217 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Brinkerton and similar soils:* 75 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Brinkerton

#### Setting

*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Local fine-silty colluvium derived from sedimentary rock

#### Typical profile

*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 18 inches:* silty clay loam
*H3 - 18 to 46 inches:* silty clay loam
*H4 - 46 to 65 inches:* channery silt loam

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 15 to 34 inches to fragipan
*Natural drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 0 to 6 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 3.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* D
*Hydric soil rating:* Yes

### Minor Components

#### Ernest

*Percent of map unit:* 10 percent
*Hydric soil rating:* No

**Laidig**

*Percent of map unit:* 5 percent
*Landform:* Mountains
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Lower third of mountainflank
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Berks**

*Percent of map unit:* 5 percent
*Landform:* Valleys, ridges
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex, linear
*Hydric soil rating:* No

**Atkins**

*Percent of map unit:* 3 percent
*Landform:* Flood plains
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Philo**

*Percent of map unit:* 2 percent
*Hydric soil rating:* No

## CdB—Cavode silt loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* l237
*Elevation:* 1,000 to 1,700 feet
*Mean annual precipitation:* 36 to 46 inches
*Mean annual air temperature:* 41 to 62 degrees F
*Frost-free period:* 130 to 160 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Cavode and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Cavode

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave
*Parent material:* Acid clayey residuum weathered from clayey shale

**Typical profile**

*Ap - 0 to 10 inches:* silt loam
*Btg - 10 to 47 inches:* silty clay loam
*BCg - 47 to 57 inches:* channery silt loam
*R - 57 to 61 inches:* bedrock

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 40 to 90 inches to lithic bedrock
*Natural drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Moderate (about 7.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* C/D
*Hydric soil rating:* No

**Minor Components**

**Gilpin**

*Percent of map unit:* 10 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Brinkerton**

*Percent of map unit:* 5 percent
*Landform:* Hills, draws
*Landform position (two-dimensional):* Toeslope, footslope
*Landform position (three-dimensional):* Base slope, head slope
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave, linear
*Hydric soil rating:* Yes

## ClB—Clymer sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* l23c
*Elevation:* 800 to 2,500 feet
*Mean annual precipitation:* 36 to 60 inches
*Mean annual air temperature:* 46 to 59 degrees F
*Frost-free period:* 110 to 180 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Clymer and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Clymer

#### Setting

*Landform:* Mountains
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Mountaintop, upper third of mountainflank
*Down-slope shape:* Convex
*Across-slope shape:* Convex

#### Typical profile

*H1 - 0 to 10 inches:* sandy loam
*H2 - 10 to 52 inches:* channery sandy loam
*H3 - 52 to 58 inches:* very channery sandy loam
*H4 - 58 to 91 inches:* bedrock

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 40 to 99 inches to lithic bedrock
*Natural drainage class:* Well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Moderate (about 6.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* B
*Hydric soil rating:* No

**Minor Components**

**Buchanan**

*Percent of map unit:* 10 percent
*Hydric soil rating:* No

**Hazleton**

*Percent of map unit:* 5 percent
*Hydric soil rating:* No

## HhB—Hazleton channery sandy loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* l245
*Elevation:* 980 to 2,800 feet
*Mean annual precipitation:* 35 to 65 inches
*Mean annual air temperature:* 45 to 55 degrees F
*Frost-free period:* 110 to 180 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Hazleton and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Hazleton**

**Setting**

*Landform:* Hillsides or mountainsides
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Mountainflank, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Acid sandy residuum weathered from noncalcareous sandstone

**Typical profile**

*Ap - 0 to 10 inches:* channery sandy loam
*Bw - 10 to 34 inches:* very channery sandy loam
*C - 34 to 58 inches:* extremely channery sandy loam
*R - 58 to 60 inches:* bedrock

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 40 to 72 inches to lithic bedrock
*Natural drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.43 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None

*Frequency of ponding:* None
*Available water storage in profile:* Low (about 4.7 inches)

**Interpretive groups**
*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* A
*Hydric soil rating:* No

**Minor Components**

**Clymer**
*Percent of map unit:* 10 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Mountaintop, interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Cookport**
*Percent of map unit:* 10 percent
*Landform:* Mountains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Mountaintop
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

## HhC—Hazleton channery sandy loam, 8 to 15 percent slopes

**Map Unit Setting**
*National map unit symbol:* l246
*Elevation:* 980 to 2,800 feet
*Mean annual precipitation:* 35 to 65 inches
*Mean annual air temperature:* 45 to 55 degrees F
*Frost-free period:* 110 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Hazleton and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Hazleton**

**Setting**
*Landform:* Hillsides or mountainsides
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Mountainflank, side slope
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Parent material:* Acid sandy residuum weathered from noncalcareous sandstone

**Typical profile**

*Ap - 0 to 10 inches:* channery sandy loam
*Bw - 10 to 34 inches:* very channery sandy loam
*C - 34 to 58 inches:* extremely channery sandy loam
*R - 58 to 60 inches:* bedrock

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* 40 to 72 inches to lithic bedrock
*Natural drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.43 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 4.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* A
*Hydric soil rating:* No

**Minor Components**

**Clymer**

*Percent of map unit:* 10 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Mountaintop, interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Cookport**

*Percent of map unit:* 10 percent
*Landform:* Mountains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Mountaintop
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

## HSD—Hazleton extremely stony sandy loam, moderately steep

**Map Unit Setting**

*National map unit symbol:* l23x

*Elevation:* 600 to 2,800 feet
*Mean annual precipitation:* 36 to 60 inches
*Mean annual air temperature:* 46 to 59 degrees F
*Frost-free period:* 110 to 180 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Hazleton and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Hazleton**

**Setting**

*Landform:* Mountains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Upper third of mountainflank
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Residuum weathered from acid sandstone

**Typical profile**

*H1 - 0 to 6 inches:* channery sandy loam
*H2 - 6 to 32 inches:* channery sandy loam
*H3 - 32 to 60 inches:* very channery sandy loam
*H4 - 60 to 68 inches:* bedrock

**Properties and qualities**

*Slope:* 15 to 25 percent
*Percent of area covered with surface fragments:* 9.0 percent
*Depth to restrictive feature:* 40 to 84 inches to lithic bedrock
*Natural drainage class:* Well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.06 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* A
*Hydric soil rating:* No

**Minor Components**

**Buchanan**

*Percent of map unit:* 10 percent
*Hydric soil rating:* No

**Dekalb**

*Percent of map unit:* 10 percent
*Hydric soil rating:* No

## Sm—Strip mines, acid

### Map Unit Setting

*National map unit symbol:* l261
*Elevation:* 200 to 1,000 feet
*Mean annual precipitation:* 35 to 51 inches
*Mean annual air temperature:* 46 to 55 degrees F
*Frost-free period:* 115 to 200 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Mined land, unstable fill:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Mined Land, Unstable Fill

#### Setting

*Landform:* Mountains
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Mountainflank
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Coal extraction mine spoil derived from sandstone and shale

#### Typical profile

*H1 - 0 to 6 inches:* very channery loam
*H2 - 6 to 60 inches:* very channery silt loam

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* A
*Hydric soil rating:* No

### Minor Components

#### Gilpin

*Percent of map unit:* 5 percent
*Hydric soil rating:* No

#### Wharton

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Interfluve, side slope, head slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Armagh, very stony**

*Percent of map unit:* 5 percent
*Landform:* Depressions on hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## VrF—Varilla-Laidig complex, 25 to 60 percent slopes, very rubbly

**Map Unit Setting**

*National map unit symbol:* 2lr7m
*Elevation:* 900 to 1,710 feet
*Mean annual precipitation:* 35 to 51 inches
*Mean annual air temperature:* 46 to 55 degrees F
*Frost-free period:* 115 to 165 days

**Map Unit Composition**

*Varilla and similar soils:* 58 percent
*Laidig and similar soils:* 34 percent
*Minor components:* 8 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Varilla**

**Typical profile**

*A - 0 to 10 inches:* very channery sandy loam
*Bw - 10 to 42 inches:* very stony sandy loam
*BC - 42 to 60 inches:* extremely stony loamy sand

**Properties and qualities**

*Slope:* 21 to 78 percent
*Percent of area covered with surface fragments:* 32.0 percent
*Depth to restrictive feature:* More than 80 inches
*Natural drainage class:* Somewhat excessively drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 4.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 8s
*Hydrologic Soil Group:* A
*Hydric soil rating:* No

### Description of Laidig

#### Setting

*Landform:* Mountainsides
*Landform position (two-dimensional):* Backslope
*Parent material:* Colluvium derived from sandstone

#### Typical profile

*A - 0 to 12 inches:* channery loam
*Bt - 12 to 39 inches:* channery loam
*Btx - 39 to 65 inches:* very stony sandy loam
*C - 65 to 80 inches:* extremely stony sandy loam

#### Properties and qualities

*Slope:* 21 to 78 percent
*Percent of area covered with surface fragments:* 9.0 percent
*Depth to restrictive feature:* 30 to 50 inches to fragipan
*Natural drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 30 to 47 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 3.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* C
*Hydric soil rating:* No

### Minor Components

#### Dekalb

*Percent of map unit:* 4 percent
*Landform:* Mountains
*Landform position (two-dimensional):* Summit
*Hydric soil rating:* No

#### Rubble land

*Percent of map unit:* 3 percent

#### Rock outcrop

*Percent of map unit:* 1 percent
*Landform:* Valley sides
*Landform position (two-dimensional):* Shoulder, backslope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex, linear

## WhB—Wharton silt loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2vxhr
*Elevation:* 1,030 to 2,910 feet
*Mean annual precipitation:* 38 to 50 inches
*Mean annual air temperature:* 45 to 49 degrees F
*Frost-free period:* 126 to 165 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Wharton and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Wharton

#### Setting

*Landform:* Hillslopes
*Landform position (two-dimensional):* Backslope, summit, shoulder
*Landform position (three-dimensional):* Side slope, interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Fine-loamy residuum weathered from shale and siltstone

#### Typical profile

*Oi - 0 to 1 inches:* slightly decomposed plant material
*Oe - 1 to 2 inches:* moderately decomposed plant material
*A - 2 to 4 inches:* silt loam
*BA - 4 to 8 inches:* silt loam
*Bt1 - 8 to 21 inches:* silt loam
*Bt2 - 21 to 42 inches:* silty clay loam
*Bt3 - 42 to 52 inches:* channery silty clay loam
*C - 52 to 69 inches:* very channery silty clay loam
*R - 69 to 79 inches:* bedrock

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 46 to 80 inches to lithic bedrock
*Natural drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 14 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* High (about 9.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C/D
*Hydric soil rating:* No

**Minor Components**

**Gilpin**

*Percent of map unit:* 8 percent
*Landform:* Hillslopes
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex, linear
*Hydric soil rating:* No

**Armagh**

*Percent of map unit:* 5 percent
*Landform:* Depressions on hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave, linear
*Hydric soil rating:* Yes

**Ernest**

*Percent of map unit:* 4 percent
*Landform:* Hillslopes
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Base slope, head slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave, linear
*Hydric soil rating:* No

**Cavode**

*Percent of map unit:* 3 percent
*Landform:* Hillslopes
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

# Soil Information for All Uses

## Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

## Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

### Hydric Soils

This table lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the

upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or

B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:
Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
Federal Register. September 18, 2002. Hydric soils of the United States.
Federal Register. July 13, 1994. Changes in hydric soils of the United States.
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
National Research Council. 1995. Wetlands: Characteristics and boundaries.
Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

## Report—Hydric Soils

| Hydric Soils–Centre County, Pennsylvania | | | | |
|---|---|---|---|---|
| **Map symbol and map unit name** | **Component** | **Percent of map unit** | **Landform** | **Hydric criteria** |
| BrB—Brinkerton silt loam, 3 to 8 percent slopes | | | | |
| | Brinkerton | 75 | Depressions | 2 |
| | Atkins | 3 | Flood plains | 2 |
| CdB—Cavode silt loam, 3 to 8 percent slopes | | | | |
| | Brinkerton | 5 | Hills, draws | 2 |
| Sm—Strip mines, acid | | | | |
| | Armagh, very stony | 5 | Depressions on hills | 2 |
| WhB—Wharton silt loam, 3 to 8 percent slopes | | | | |
| | Armagh | 5 | Depressions on hills | 2 |

# Sanitary Facilities

This folder contains a collection of tabular reports that present soil interpretations related to sanitary facilities. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Sanitary facilities interpretations are tools designed to guide the user in site selection for the safe disposal of sewage and solid waste. Example interpretations include septic tank absorption fields, sewage lagoons, and sanitary landfills.

## Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Septic tank absorption fields* are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope,

saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

## Report—Sewage Disposal

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

| Sewage Disposal–Centre County, Pennsylvania | | | | | |
|---|---|---|---|---|---|
| Map symbol and soil name | Pct. of map unit | Septic tank absorption fields | | Sewage lagoons | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value |
| BrB—Brinkerton silt loam, 3 to 8 percent slopes | | | | | |
| Brinkerton | 75 | Very limited | | Very limited | |
| | | Depth to saturated zone | 1.00 | Depth to saturated zone | 1.00 |
| | | Slow water movement | 1.00 | Slope | 0.92 |
| | | | | Seepage | 0.53 |
| CdB—Cavode silt loam, 3 to 8 percent slopes | | | | | |
| Cavode | 85 | Very limited | | Very limited | |
| | | Depth to saturated zone | 1.00 | Depth to saturated zone | 1.00 |
| | | Slow water movement | 1.00 | Slope | 0.68 |
| | | Depth to bedrock | 0.38 | Depth to hard bedrock | 0.02 |
| ClB—Clymer sandy loam, 3 to 8 percent slopes | | | | | |
| Clymer | 85 | Somewhat limited | | Somewhat limited | |
| | | Slow water movement | 0.47 | Seepage | 0.93 |
| | | Depth to bedrock | 0.34 | Slope | 0.92 |
| | | | | Depth to hard bedrock | 0.01 |
| HhB—Hazleton channery sandy loam, 3 to 8 percent slopes | | | | | |
| Hazleton | 80 | Very limited | | Very limited | |
| | | Seepage, bottom layer | 1.00 | Seepage | 1.00 |
| | | Filtering capacity | 1.00 | Slope | 0.82 |
| | | Depth to bedrock | 0.34 | Depth to hard bedrock | 0.01 |
| HhC—Hazleton channery sandy loam, 8 to 15 percent slopes | | | | | |
| Hazleton | 80 | Very limited | | Very limited | |
| | | Seepage, bottom layer | 1.00 | Slope | 1.00 |
| | | Filtering capacity | 1.00 | Seepage | 1.00 |
| | | Slope | 0.63 | Depth to hard bedrock | 0.01 |
| | | Depth to bedrock | 0.34 | | |
| HSD—Hazleton extremely stony sandy loam, moderately steep | | | | | |
| Hazleton | 80 | Very limited | | Very limited | |
| | | Slope | 1.00 | Slope | 1.00 |
| | | Seepage, bottom layer | 1.00 | Seepage | 1.00 |
| | | Depth to bedrock | 0.25 | Large stones | 0.08 |

| Sewage Disposal–Centre County, Pennsylvania | | | | | |
|---|---|---|---|---|---|
| Map symbol and soil name | Pct. of map unit | Septic tank absorption fields | | Sewage lagoons | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value |
| Sm—Strip mines, acid | | | | | |
| Mined land, unstable fill | 85 | Very limited | | Very limited | |
| | | Seepage, bottom layer | 1.00 | Large stones | 1.00 |
| | | Unstable fill | 1.00 | Seepage | 1.00 |
| | | Large stones | 1.00 | Slope | 1.00 |
| | | Filtering capacity | 1.00 | | |
| | | Slope | 1.00 | | |
| VrF—Varilla-Laidig complex, 25 to 60 percent slopes, very rubbly | | | | | |
| Varilla | 58 | Very limited | | Very limited | |
| | | Slope | 1.00 | Slope | 1.00 |
| | | Seepage, bottom layer | 1.00 | Seepage | 1.00 |
| | | Large stones | 0.25 | Large stones | 0.94 |
| Laidig | 34 | Very limited | | Very limited | |
| | | Depth to saturated zone | 1.00 | Slope | 1.00 |
| | | Slope | 1.00 | Seepage | 0.53 |
| | | Slow water movement | 1.00 | | |
| WhB—Wharton silt loam, 3 to 8 percent slopes | | | | | |
| Wharton | 80 | Very limited | | Very limited | |
| | | Depth to saturated zone | 1.00 | Depth to saturated zone | 1.00 |
| | | Slow water movement | 1.00 | Slope | 0.92 |
| | | Depth to bedrock | 0.01 | Seepage | 0.50 |

# Vegetative Productivity

This folder contains a collection of tabular reports that present vegetative productivity data. The reports (tables) include all selected map units and components for each map unit. Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

## Nonirrigated Yields by Map Unit

The average yields per acre that can be expected of the principal crops under a high level of management are shown in this table. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

If yields of irrigated crops are given, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

The land capability classification of map units in the survey area is shown in this table. This classification shows, in a general way, the suitability of soils for most kinds of field crops (United States Department of Agriculture, Soil Conservation Service, 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit.

*Capability classes*, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

- Class 1 soils have slight limitations that restrict their use.
- Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.
- Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
- Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
- Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
- Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion.

*Capability units* are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

Reference:
United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

## Report—Nonirrigated Yields by Map Unit

| Nonirrigated Yields by Map Unit–Centre County, Pennsylvania | | | | | | |
|---|---|---|---|---|---|---|
| **Map symbol and soil name** | **Land capability** | **Corn** | **Grass-legume hay** | **Oats** | **Pasture** | **Soybeans** |
| | | *Bu* | *Tons* | *Bu* | *AUM* | *Bu* |
| BrB—Brinkerton silt loam, 3 to 8 percent slopes | | 90 | 2.50 | — | 5.0 | 25 |
| Brinkerton | 4w | | | | | |
| CdB—Cavode silt loam, 3 to 8 percent slopes | | 90 | 3.00 | 60 | 5.5 | 30 |
| Cavode | 3w | | | | | |
| ClB—Clymer sandy loam, 3 to 8 percent slopes | | 120 | 3.50 | 75 | 8.5 | — |
| Clymer | 2e | | | | | |
| HhB—Hazleton channery sandy loam, 3 to 8 percent slopes | | 125 | 3.50 | 75 | 8.0 | — |
| Hazleton | 2e | | | | | |
| HhC—Hazleton channery sandy loam, 8 to 15 percent slopes | | 115 | 3.50 | 70 | 8.0 | — |
| Hazleton | 3e | | | | | |
| HSD—Hazleton extremely stony sandy loam, moderately steep | | — | — | — | — | — |
| Hazleton | 7s | | | | | |
| Sm—Strip mines, acid | | — | — | — | — | — |
| Mined land, unstable fill | 7s | | | | | |
| VrF—Varilla-Laidig complex, 25 to 60 percent slopes, very rubbly | | — | — | — | — | — |
| Varilla<br>Laidig | 8s<br>7s | | | | | |
| WhB—Wharton silt loam, 3 to 8 percent slopes | | — | — | — | — | — |
| Wharton | 2e | | | | | |

# References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf