

FLOODPLAIN REGULATIONS

TECHNICAL BULLETIN

Hundreds of years ago, industries settled along the banks of the Brandywine Creek, White Clay Creek, Red Clay Creek, and the Christiana River to harness the water's power. Townships and cities settled around the industrial hubs and continued to expand, even as the use of hydropower declined. Today, these waterways enhance the communities and ecosystems, while posing as a threat to endanger lives, disrupt economic activities and cause extensive damage during flood events. Communities along the waterways in southeastern Pennsylvania and northern Delaware often face the threat of rising waters. Many residents can remember how hurricanes, tropical storms, and heavy rains have disrupted their lives.

With a population expected to exceed 650,000 by 2030, the Brandywine-Christina watershed is a critical piece of the regional economy, providing over 100,000 jobs and stimulating \$4.9 billion annually in economic activity (2018 Brandywine-Christina State of the Watershed Report). Floods have the potential to cause significant disruptions to the economy and transit in the region, on top of the risk to life and property. The challenge of flooding will continue to prove difficult for communities as storms become more frequent and intense, and as development continues to increase impervious surfaces across the watershed.

All municipalities in Pennsylvania are required to participate in the National Flood Insurance Program (NFIP) and adopt local floodplain management ordinances. These ordinances are critical tools to helping build safer, more resilient communities. The purpose of these ordinances is to identify floodplains and Special Flood Hazard Areas, manage a floodplain permitting program, establish construction standards, and enforce structural code requirements with minimal allowed variances.



Flooding along a roadway in Chester County where a sign cautions "Roadway Subject to Flooding."



Image above: An aerial view of Chadds Ford, PA and the Brandywine Museum of Art. As a historic mill building, the museum is located partially within the Floodway while most of the adjacent properties are within the 1% Annual Chance Flood Hazard Zone (also referred to as the 100-Year Floodplain)

Communities may choose to implement higher standards to further reduce local flood risk, such as:

- Increased flood-hardening standards for structures.
- Mandatory compensatory storage requirements.
- Adoption of a flood overlay district to regulate land use in flood prone areas beyond the official 100-year floodplain as delineated by FEMA.

Considerations for development of a flood overlay district might include:

- Areas adjacent to or within a specific distance of a stream, swale, or waterway which may be subject to periodic flooding or inundation.
- Known high-water marks from past flooding events.
- Areas of alluvial soils based on local, state, or federal surveys.
- The 500-year floodplain as delineated by FEMA flood maps.

By adopting higher standards, municipalities may be eligible to participate in FEMA's **Community Rating System (CRS)** program. This program

awards points to a municipality for activities and regulations that go beyond the minimum requirements, which translate to lowered flood insurance premiums for their residents.

ENABLING LEGISLATION

Commonwealth of Pennsylvania

The Pennsylvania Flood Plain Management Act of 1978, delegates the responsibility to local governmental units to adopt floodplain management regulations to promote public health, safety, and the general welfare of its citizenry.

Pennsylvania Municipalities Planning Code

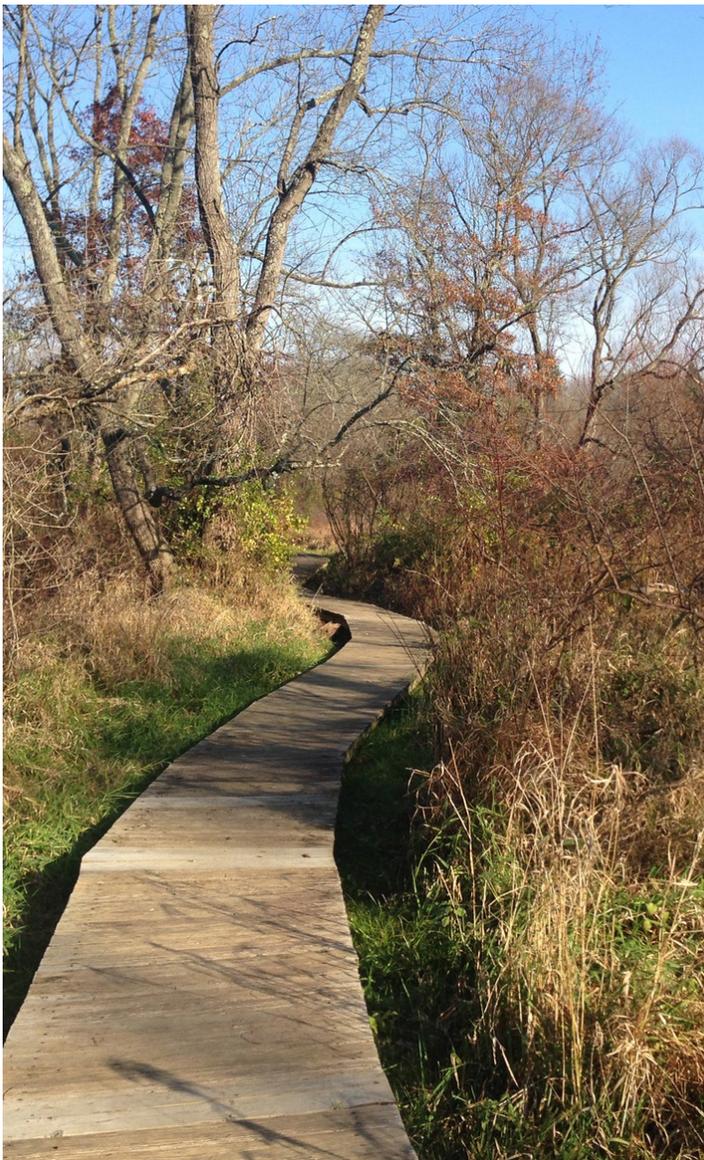
Act 247, Sections 604 and 605 of the Pennsylvania Municipalities Planning Code (MPC) encourages municipalities to regulate for the preservation of forests, wetlands, aquifers and floodplains and act to create zoning districts for floodplain areas.

IMPLEMENTATION GUIDE

Development and Acceptance

Identify Goals

- Determine the features for protection within the floodplain management ordinance, such as specific development and building activities, active or passive recreation opportunities, structure flood hardening requirements, living space elevation requirements, flood zones or delineated floodplain districts, conservation activities such as vegetation management or additional restrictions on specific slope angles or soil types.



A boardwalk winds across the wetlands of a floodplain in Chadds Ford, PA adjacent to the Brandywine Creek.

- **Determine Location:** Determine whether new or amended provisions will be located in the Zoning or Subdivision and Land Development ordinance.
- A model ordinance that would meet the minimum state requirements includes the following language:
 - Promote the general health, welfare, and safety of the community
 - Encourage the utilization of appropriate construction practices to prevent or minimize flood damage in the future
 - Minimize danger to public health by protecting water supply and natural drainage
 - Reduce financial burdens imposed on the community, its governmental units, and its residents, by preventing excessive development in areas subject to flooding
 - Comply with federal and state floodplain management requirements

Preliminary Steps

- **Identify a budget and potential funding sources.**
- **Determine Responsible body:** Determine whether the governing body will oversee this process or if it will be delegated to the Planning Commission or a project task force.
- **Technical Support:** Determine if a consultant will be needed to support the development of the floodplain management ordinance.
- **Review MPC:** Ensure that the planning team has reviewed the MPC's guidance on the development of zoning ordinances and amendments.

Identify features to be included in the Ordinance

- Determine the most critical features to include within the ordinance. These features should be well documented in the Comprehensive Plan and other Township planning documents.

Draft Ordinance Creation

- The ordinance should clarify the intent and purpose of the floodplain protection provisions, specify the protections



This section of floodplain along the Brandywine Creek has wetland, wooded areas, and meadows. A utility easement also runs across the floodplain, with utility poles along the east side of the Brandywine while railroad tracks parallel the creek to its west.

represented, and detail its intended application.

- A planning consultant or township solicitor can assist with producing the draft ordinance.

Landowner Outreach

- Engaging landowners of properties with floodplains early in the process is essential for promoting transparency and fostering a clear understanding of the process.
- Holding dedicated public meetings with landowners provides an opportunity for them to ask questions and fosters open dialogue between landowners and the municipality, especially if such communication has not yet been established.

Public Review and Input

- The MPC stipulates that the municipal planning commission must have 45 days to review the ordinance; however, if the commission is the one that created the ordinance, this review may not be required.

- During this 45-day review period, the floodplain management ordinance must be submitted to the County Planning Commission and surrounding municipalities for a 45-day review.
- The ordinance should also be available for public review.

Adoption

- Once the 45-day review period is over and comments are collected, the municipality is required to hold a Public Hearing prior to adoption.
- If the Public Hearing does not lead to any changes or only minor corrections to the ordinance, the governing body can proceed with adopting the floodplain management provisions, contingent on any minor corrections.
- If significant revisions are proposed, such as substantial additions or deletions of features, a new Act 247 Review and Public Hearing should be conducted before adoption.

- Upon completion of the public hearing, the governing body may vote to adopt the ordinance.
- Within 30 days of adoption, the ordinance must be sent to the surrounding municipalities.
- After adoption, the ordinance must be submitted to the county recorder of deeds within 60 days of adoption.

Next Steps

- Amend existing Zoning and Subdivision and Land Development ordinances to reflect and reference the floodplain management provisions.
- Incorporate the floodplain management provisions into the standard review process for Subdivision and Land Development applications and approvals.
- Update the online version of the municipalities zoning ordinance to include the new/updated

floodplain protections ordinance either on the Township's website or through eCode.

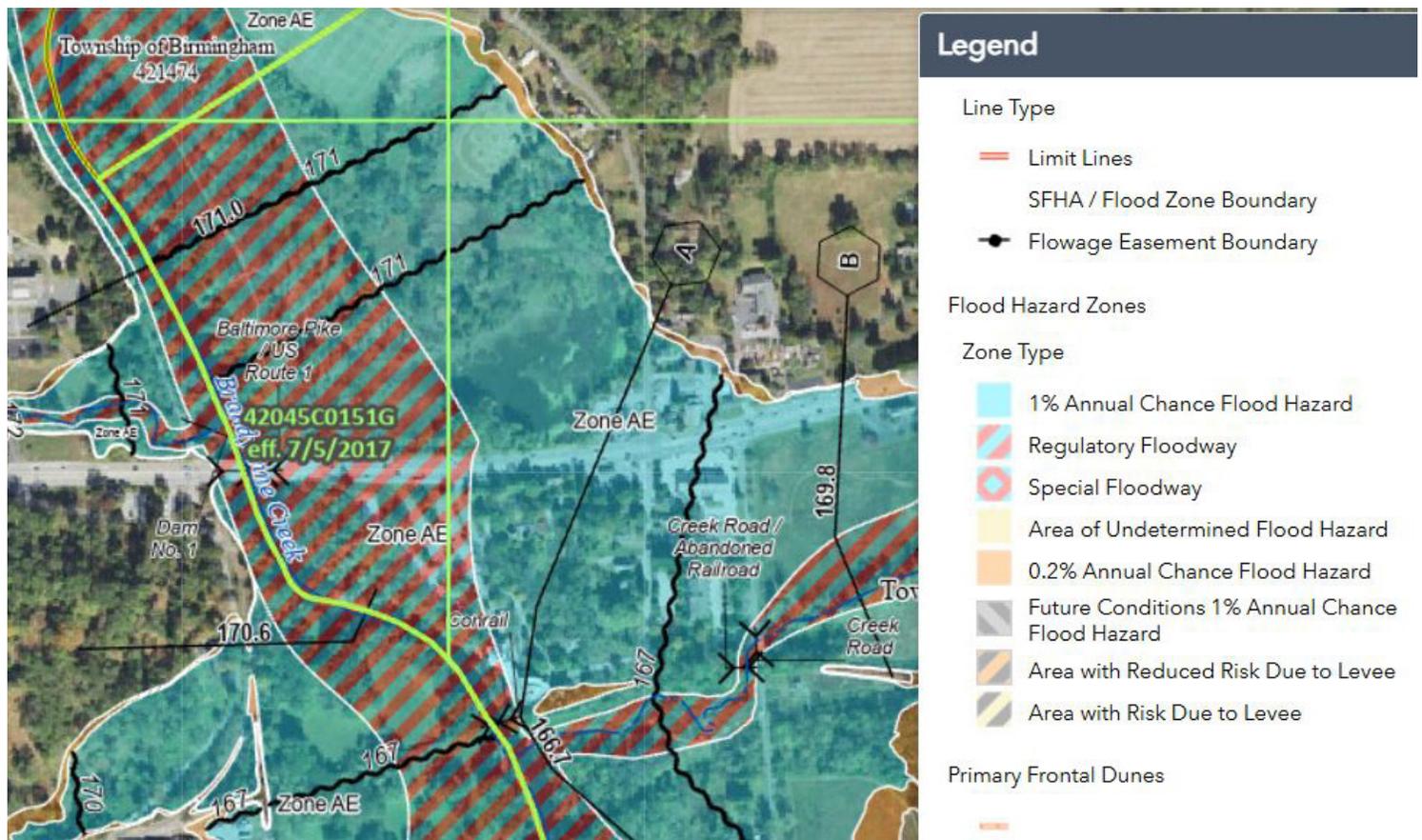
CASE STUDIES FROM THE BRANDYWINE WATERSHED

Chester County, PA

County Code of Ordinances: Provisions for Flood Hazard Reduction (Ch. 34, Art II Div 3- § 34-90)

City of Coatesville: Floodplain Conservation Overlay District (Ch 224, Art VIII)

- Outlines areas in Floodplain Conservation Overlay District as:
 - Special flood hazard areas (SFHAs) in the Flood Insurance Study (FIS) and the accompanying Flood Insurance Rate Maps (FIRMs)
 - Any community-identified flood hazard areas



The Federal Emergency Management Agency's (FEMA) National Flood Hazard Layer Viewer provides an overlay of the 100 year floodplain (1% Annual Chance Flood Hazard) on the users chosen location. This image shows Chadds Ford, Pennsylvania with a majority of the core village located within the 100-year floodplain (as denoted by the aqua blue). The 1% Annual Chance Flood Hazard is also known as the base flood.

- Regulations:
 - Limits activities and development within the designated Floodplain Conservation Overlay District
 - Requires that hydrologic and hydraulic analysis of any proposed development or activity within the flood area does not result in any increase in water elevation levels within the community during flood events
 - States all structures must be designed and constructed with capability of resisting the 1% annual chance flood

East Bradford Township: Floodplain District Regulations (Ch. 115, Art XI §115-42)

- Includes language to protect soil stabilization, water quality, ground water resources, trees and riparian vegetation, to preserve fish and wildlife habitat.
- Identifies the Riparian Buffer Area (RBA) Conservation District, which prohibits new construction or development within 50 feet landward from the top of the bank of any watercourse.

West Marlborough Township: Description and Special Requirements of Identified Floodplain Areas (Art II Section 204.4.B.)

- Outlines areas in the identified floodplain as:
 - Special Flood Hazard Areas (SFHAs) in the Flood Insurance Study (FIS) and the accompanying Flood Insurance Rate Maps (FIRMs).
 - Any community-identified flood hazard or ponding areas, as identified by Local Flood Hazard Maps, topographic maps, flood records, historic high-water marks, alluvial soil studies or regional, state and national studies.
- Regulations:
 - Clear standards and criteria for permitted uses, prohibited activities and any improvements to existing structures within the floodplain area.
 - Prohibited activities include but are not limited to; the cutting or removal of living trees or invasive vegetation, aside from

Delaware County, PA

County Code of Ordinances: Design Standards and Improvements in Designated Floodplain Districts (Ch. 62, Art III)

Thornbury Township: Definition of Floodplain Conservation District (Ch. 27, Article XV §27-1504)

- Outlines Floodplain Conservation District as:
 - Low areas adjoining and including a watercourse or other body of water (such as pond, marsh and/or lake) subject to the 100-year flood level.
 - Areas identified in the Flood Insurance Study (FIS) and the accompanying Flood Insurance Rate Maps (FIRMs)
 - Areas with alluvial soils as delineated in the Soil Survey for Chester and Delaware Counties, Pennsylvania, 1964, prepared by the United States Department of Agriculture, Soil Conservation Service.
- Regulations:
 - Allowable activities within the Floodplain Conservation District include:
 - Agricultural activities in accordance with USDA and NRCS soil conservation practices, including crops, pasture and grazing, outdoor plant nurseries, orchards or tree farms, and activities involved with fishing and hunting.
 - Wildlife sanctuaries.
 - Floodplain Conservation District aims to:
 - Prohibit uses which are dangerous to health, safety or property in times of flood and/or cause increase flood height or velocities
 - Protect the quality and quantity of surface and subsurface water supplied adjacent to and/or underlying the floodplain
 - Provide areas for the deposition of flood-borne sediment
 - Protect the natural drainage ways in order to provide areas for flood water transport with the least possible perturbation to life and property



Chadds Ford: Floodplain Conservation Overlay District (Ch. 135, Article XIX)

- Outlines areas included in the Floodplain Conservation Overlay District as:
 - Special flood hazard areas (SFHAs) in the Flood Insurance Study (FIS) and the accompanying Flood Insurance Rate Maps (FIRMs)
 - Any community-identified flood hazard or ponding areas, as identified by Local Flood Hazard Maps, topographic maps, flood records, historic high-water marks, alluvial soil studies or regional, state and national studies.
- Regulations:
 - Historic Structures undergoing repair or rehabilitation that would constitute a Substantial Improvement, as defined in this chapter, shall comply with all ordinance requirements that do not preclude the Structure’s continued designation as an Historic Structure.
 - No new construction or development within 50 feet to the top of bank of any watercourse in the Identified Floodplain Area.

New Castle County, DE

County Code of Ordinances: Floodplain management regulations (Ch. 40, Art X Div 40.10.300)

- Through participation in FEMA’s Community Rating System (CRS), New Castle County has earned a Class 6 rating which offers a 20% discount on flood insurance premiums in the community.

City of Wilmington, DE: Requirements in All Special Flood Hazard Areas (Ch. 48 Art XII Div 4)

- Identifies Special Flood Hazard Areas (SFHAs), subject to periodic inundation which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare. Development that is inadequately elevated, improperly floodproofed, or otherwise unprotected from flood damage also contributes to the flood loss.

ADDITIONAL RESOURCES

Chester County, PA

- Chester County Planning Commission: Includes Planning Guides and Tools, as well as insight into Landscapes3 and implementation actions.

Delaware County, PA

- Delaware County Planning Department Floodplain Management: This resource connects residents to flood resilience workshops and flood management and planning tools.

New Castle County, DE

- New Castle County’s Department of Land Use Flood Protection: A guide of how to minimize damage from future flooding events in your community

State of Pennsylvania

Pennsylvania Department of Community and Economic Development (DCED)

- **Technical Information on Floodplain Management**: Part 5 of a 10-part series offering technical assistance to managing planning tools. This publication is specifically designed to address the regulatory authority and requirements for implementing the National Flood Insurance Program and Pennsylvania Flood Plain Management Act 166 of 1978., to explain the steps involved with determining the 1% annual chance flood and regulating development in the floodplain, and to outline additional resources available for floodplain management at the commonwealth and federal level

Pennsylvania Emergency Management Agency (PEMA)

- **Flooding and Floodplain Management: Providing community assistance visits, contacts, mapping, technical and mapping assistance, and training on floodplain management in Pennsylvania.**
- **Substantial Improvements / Substantial Damages Toolkit:** This document will help local officials navigate the process of making SI/SD determinations and develop local plans and administrative procedures required to successfully conduct SI/SD determinations and administer flood management programs.

State of Delaware

Delaware Natural Resources and Environmental Control (DNREC)

- **DNREC Floodplain Management Program:** This program and resources aim to preserve public health, safety, and well-being and protect property by reducing flood hazard

risks statewide.

- **DNREC Delaware Flood Planning Tool:** Interactive webmap that informs users whether their property is at risk from flooding, including if it is within the Federal Emergency Management Agency’s 100-year floodplain.

National

Federal Emergency Management Agency (FEMA)

- **FEMA Flood Map Service Center (MSC):** Official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). It offers tools to find official flood maps, access a range of other flood hazard products, and take advantage of tools for better understanding flood risk.
- **National Flood Hazard Layer Viewer:** Interactive webmap that displays the official effective national flood hazard data.
- **Community Rating System (CRS):** Comprehensive program information source from FEMA.
- **The CRS Coordinator’s Manual - CRSresources: The National Flood Insurance Program Community Rating System Coordinator’s Manual FIA-15/2017 and the 2021 Addendum to the Coordinator’s Manual, 2017 Edition, are undergoing limited revisions and are not available. The revised manual will be made available as soon as possible.**
- **Community Rating System Explorer:** Provided by NOAA and The Nature Conservancy. This tool focused on coastal areas of SC, NC, MS, TX, and FL at time of publication, but new areas will be added.

