



Hazard Mitigation Plan Chester County, Pennsylvania



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TETRA TECH

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EXECUTIVE SUMMARY

The 2021 update to the Chester County Hazard Mitigation Plan (HMP) was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA 2000). The DMA 2000 requires states and local governments to prepare HMPs to remain eligible to receive hazard mitigation grant funds made available annually and in the wake of federally declared disasters. Additionally, DMA 2000 effectively improves the disaster planning process by increasing hazard mitigation planning requirements for hazard events. DMA 2000 requires participating municipalities to (1) document their hazard mitigation planning process, and (2) identify hazards; potential losses; and mitigation needs, goals, and strategies.

The Chester County HMP represents the work of citizens, elected and appointed government officials, business leaders, and volunteer and nonprofit groups to protect community assets, preserve economic viability of the community, and save lives. DMA 2000 regulations require formal updates and adoptions of local plans every 5 years to reassess risks and update local strategies to manage and mitigate those risks. To comply, Chester County and inclusive jurisdictions actively participated in updating the county HMP. Extensive outreach efforts by Chester County Department of Emergency Services resulted in participation from all 73 municipalities. Upon completion and approval of the HMP, participating jurisdictions will continue to address and implement findings and recommendations of this plan update.

Table ES-1 identifies the jurisdictions that actively participated in the HMP update process.

Table ES-1. Participating Jurisdictions in the 2021 Chester County HMP Update

Jurisdictions		
Chester County	Elverson Borough	Thornbury Township
Atglen Borough	Honey Brook Township	Tredyffrin Township
Avondale Borough	Kennett Square Borough	Upper Oxford Township
Birmingham Township	Kennett Township	Upper Uwchlan Township
Caln Township	London Britain Township	Uwchlan Township
Charlestown Township	London Grove Township	Valley Township
Coatesville City	Londonderry Township	Wallace Township
Downingtown Borough	Lower Oxford Township	Warwick Township
East Bradford Township	Malvern Borough	West Bradford Township
East Brandywine Township	Modena Borough	West Brandywine Township
East Caln Township	New Garden Township	West Caln Township
East Coventry Township	New London Township	West Chester Borough
East Fallowfield Township	Newlin Township	West Fallowfield Township
East Goshen Township	North Coventry Township	West Goshen Township
East Marlborough Township	Oxford Borough	West Grove Borough
East Nantmeal Township	Parkesburg Borough	West Marlborough Township
East Nottingham Township	Penn Township	West Nantmeal Township
East Pikeland Township	Pennsbury Township	West Nottingham Township
East Vincent Township	Phoenixville Borough	West Pikeland Township
East Whiteland Township	Pocopson Township	West Sadsbury Township
Easttown Township	Sadsbury Township	West Vincent Township
Elk Township	Schuylkill Township	West Whiteland Township
Franklin Township	South Coatesville Borough	Westtown Township
Highland Township	South Coventry Township	Willistown Township
Honey Brook Borough	Spring City Borough	



During the plan update process, Chester County and its participating municipalities engaged in the following planning process steps:

1. Identified and prioritized hazards that may affect the county and its municipalities
2. Assessed the county’s and each municipality’s vulnerabilities to these hazards
3. Identified mitigation actions that can reduce those vulnerabilities
4. Developed a strategy for implementing those actions, including identifying the agency (or agencies) responsible for each implementation

Throughout the planning process, the general public was offered an opportunity to comment on the existing HMP and provide suggestions for the updated version. The county hosted two Planning Team meetings and two Risk Assessment meetings that were open to the public during which residents could provide input on the HMP.

The following hazards were identified by the Steering Team as presenting the highest risk to the county and its municipalities:

- Dam Failures
- Drought and Water Supply Deficiencies
- Earthquakes
- Environmental Hazards – Hazmat Releases
- Environmental Hazards – Oil and Natural Gas Pipelines
- Extreme Temperatures
- Floods, Flash Floods, and Ice Jams
- Hurricanes and Tropical Storms
- Invasive Species
- Nuclear Incidents
- Opioid Addiction Responses
- Pandemics
- Radon Exposure
- Structural Fires
- Terrorism
- Tornadoes and Windstorms
- Transportation Accidents
- Utility Failures
- Winter Storms

To mitigate the effects of those hazards, the Steering Team identified the following goals and objectives for hazard mitigation over the next 5 years:

Goal 1: Prevent injury/death, physical damage, and other impacts from hazards in Chester County.

- Objective 1.1 Enhance regulations for addressing development in hazard-prone areas.
- Objective 1.2 Upgrade infrastructure to reduce the likelihood of hazards from impacting Chester County.
- Objective 1.3 Support government agencies and non-governmental organizations to provide aid to vulnerable populations before, during and after a hazard.

Goal 2: Protect the citizens of Chester County, as well as public and private property, from the impacts of natural and human-caused hazards.

- Objective 2.1 Protect existing structures, including critical facilities and culturally or historically significant assets, from damage that can be caused by hazards.
- Objective 2.2 Acquire, relocate, elevate, and/or retrofit existing structures, including repetitive loss properties, located in hazard areas.



- Objective 2.3 Improve existing stormwater management systems to reduce flooding.
- Objective 2.4 Provide resources that encourage regular inspection and maintenance of existing stormwater facilities to reduce flooding.
- Objective 2.5 Assist with updating local stormwater management standards to reduce flooding.
- Objective 2.6 Encourage homeowners, renters, and businesses to insure their properties against all hazards, including purchasing flood coverage under the National Flood Insurance Program (NFIP).

Goal 3: To protect and restore existing natural resources including wetlands, floodplains, and riparian buffers.

- Objective 3.1 Lessen impacts on natural resources and open space from natural and human-caused hazards by promoting sustainable land use and water resources management practices.
- Objective 3.2 Provide appropriate safeguards for the preservation of the quality of water resources, stream corridors, watershed areas, and floodplains.

Goal 4: To promote public awareness on the potential impacts of natural and non-natural hazards, and actions to reduce those impacts.

- Objective 4.1 Develop public education and outreach programs on hazards and hazard mitigation.
- Objective 4.2 Educate property owners in hazard-risk areas regarding their risks and the precautions they can take.
- Objective 4.3 Encourage residents to implement hazard mitigation and preparedness measures on their properties.
- Objective 4.4 Encourage local participation in the Community Rating System (CRS) Program.
- Objective 4.5 Provide outreach and educational opportunities to the community about where to find comprehensive information on hazards.

Objectives and actions to be implemented are discussed in the Mitigation Action Plan in Section 6 of this HMP.

Additionally, Steering Team members will meet annually to evaluate the status of plan implementation and prepare a summary report of HMP status and any needed updates. The mitigation evaluation will address changes as new hazard events occur, as the area develops, and as more information becomes available pertaining to hazards and their impacts. The evaluation will include an assessment of whether the planning process and actions have been effective, whether development or other issues warrant changes to the HMP or its priorities, if progress toward the communities' goals is satisfactory, and whether changes are warranted. Monitoring, evaluating, and updating the plan is further discussed in Section 7, Plan Maintenance. The public is encouraged to give feedback (1) by directly contacting the County Hazard Mitigation Planning Team Coordinator, (2) during recurring review meetings, and (3) during the 5-year revision process.

To request information or provide comments regarding this plan, please contact the Chester County Department of Emergency Services. Contact information is provided below:

Mailing Address: Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380

Contact Name: Gabby Ratliff; Community Resilience Coordinator

Telephone: (610) 344-5042



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CERTIFICATION OF ANNUAL REVIEW MEETINGS

The Chester County Hazard Mitigation Planning Team has reviewed this Hazard Mitigation Plan (HMP). See Section 7 of this document for further details regarding this certification section. The Chester County Department of Emergency Services HMP Coordinator hereby certifies the review.

YEAR	DATE OF MEETING	PUBLIC OUTREACH ADDRESSED?*	SIGNATURE
2015	N/A	N/A	The annual review meeting was not conducted.
2016	<ul style="list-style-type: none"> 03/01/2016 05/23/2016 	Yes	Jeff Emmons William Turner
2017	03/01/2017	Yes	William Turner
2018	03/15/2018	Yes	William Turner
2019	Chester County engaged in a full update of the HMP during 2019-2021.		
2020			
2021			
2022			
2023			

* Confirm yes here annually, and describe on record of changes page.





RECORD OF CHANGES

DATE	DESCRIPTION OF CHANGE MADE, MITIGATION ACTION COMPLETED, OR PUBLIC OUTREACH PERFORMED	CHANGE MADE BY (PRINT NAME)	CHANGE MADE BY (SIGNATURE)
4/1/2015	Entire plan re-write and reformatting for 2015 update. Inclusions on human-caused hazards	Jeff Emmons	
12/22/2015	Page 80, link to additional information on pipelines changed to www.chesco.org/planning/pipelines	Caleb Meute	
7/10/2018	Wallace Township Municipal Assessment corrections <ul style="list-style-type: none"> - No public water service - Comprehensive Plan updated 6/01/2015 - Added Historical Preservation Committee - Added Environmental Preservation Committee - Added Public Municipal Road Crew - Added Municipal Sewer Authority - Added W Brandywine Police Dept. covers Wallace 	Andrew Thurston	
1/17/2019	Added information to risk assessment hazard profiles <ul style="list-style-type: none"> - Impact to responders - Impacts to continuity of operations - Impacts to property, environmental and public confidence 	Andrew Thurston	
4/9/2021	Entire plan rewrite and reformatting for the 2021 update.	Gabby Ratliff	



SECTION 1 INTRODUCTION

This section presents background information, describes the purpose, and defines the scope of the 2021 update of the Chester County Hazard Mitigation Plan (HMP).

1.1 BACKGROUND

Across the United States, natural and human-caused disasters have led to increasing deaths, injuries, property damage, and interruptions of business and government services. The time, money, and effort spent to recover from these disasters exhaust resources, diverting attention from important public programs and private agendas.

Chester County, Pennsylvania, has experienced a significant number of statewide or county-specific disaster declarations since 1954. The emergency management community, citizens, elected officials, and other stakeholders in Chester County recognize the impact of disasters on their community and have concluded that proactive efforts need to be taken to reduce the impact of natural and human-caused hazards. To that purpose, Chester County is committed to updating and maintaining the Chester County HMP.

“Hazard mitigation” describes actions taken to prevent or reduce the long-term risks to life and property caused by a hazard event. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, mitigation actions can be long-term, cost-effective measures taken to reduce the risk of loss.

The Chester County Hazard Mitigation Steering Committee (composed of Chester County officials and other key stakeholders) and the Planning Team (composed of Chester County officials, municipal representatives, emergency responders, school and higher education representatives, community groups, and any other stakeholder with a role in hazard mitigation) has updated this HMP. Chester County contracted Tetra Tech, Inc. (Tetra Tech) to prepare the 2021 HMP update.

The HMP update is the result of several months of collaboration among the citizens and officials of the county and representatives from Tetra Tech to develop a pre-disaster, multi-hazard mitigation plan that will guide the county toward greater disaster resistance while respecting the character and needs of the community.

1.2 PURPOSE

The purpose of this HMP is to minimize the effects that natural, technological, and man-made hazards have on the people, property, environment, and business operations within Chester County. This document exists to provide the background information and rationale for the mitigation actions that the Steering Committee, Planning Team, and municipal representatives have chosen to implement across the county.

The document is governed by the Disaster Mitigation Act of 2000 (DMA 2000) and its implementing regulations (Title 44 *Code of Federal Regulations* [CFR] §201.6, published February 26, 2002). Local jurisdictions must comply with the DMA 2000, and these regulations to remain eligible for funding and technical assistance from state and federal hazard mitigation programs.

1.3 SCOPE

The implementation actions outlined within this HMP apply to Chester County and any municipalities within the county that adopt this plan. Only those municipalities that have participated in the plan update process may adopt this plan and will be eligible for state and federal hazard mitigation funding. For the purpose of this plan, municipal participation was defined as providing information (e.g., via completion and submission of an Evaluation of Identified Hazards Worksheet, Capability Assessment Survey, NFIP Survey, Mitigation Strategy



5-Year Plan Review Worksheet, and/or Municipal Risk Factor Analysis) and participation by an official municipal representative at a planning meeting or in individual outreach.

1.4 AUTHORITY AND REFERENCE

This HMP was prepared in accordance with the following regulations and guidance:

- FEMA “Local Mitigation Planning Handbook,” March 2013
- FEMA “Integrating Hazard Mitigation into Local Planning,” March 1, 2013
- FEMA “Plan Integration: Linking Local Planning Efforts,” July 2015
- Local Mitigation Plan Review Guide, October 1, 2011
- DMA 2000 (Public Law 106-390), October 30, 2000
- 44 CFR Parts 201 and 206 (including February. 26, 2002; October. 1, 2002; October. 28, 2003; and Sept. 13, 2004 Interim Final Rules)
- FEMA “How-To Guide for Using HAZUS-MH for Risk Assessment” (Document No. 433), February 2004
- FEMA Mitigation Planning How-To Series (FEMA 386-1 through 4), 2002
Available online at: <http://www.fema.gov/fima/planhowto.shtm>.
- FEMA “Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards,” January 2013
- Commonwealth of Pennsylvania’s All-Hazard Mitigation Planning Standard Operating Guide, October 18, 2013

A full set of references used in updating the HMP is included in Appendix A.



SECTION 2 COUNTY PROFILE

Section 2 of the Chester County Hazard Mitigation Plan (HMP) discusses the geography and environment, community facts, population and demographics, and land use and development in Chester County.

2.1 GEOGRAPHY AND ENVIRONMENT

Chester County encompasses 760 square miles of cities, farmland, and forest land with 8.7 square miles being water. Chester County is bordered to the southeast by the State of Delaware, to the south by the State of Maryland, to the west by Lancaster County, to the northwest by Berks County, to the northeast by Montgomery County, and to the east by Delaware County.

Valley Forge National Historical Park lies on the boundary between Chester and Montgomery Counties. Hopewell Big Woods National Historical Site lies on the boundary of Chester and Berks Counties. The Schuylkill River Heritage Area encompasses the northern 1/3 of the county. The highest elevation is 1,020 feet above mean sea level (MSL) at Welsh Mountain in Honeybrook Township and the lowest elevation of approximately 66 feet above MSL is located at the Schuylkill River, Chester-Montgomery county line. A considerable number of rivers and streams are present in and around the county and Chester County itself contains 20 rivers, streams, and creeks. French Creek and the Schuylkill River run along the northern part of the county, Octoraro Creek runs along the western border, and the Brandywine Creek forms part of its eastern border.

2.2 COMMUNITY FACTS

On March 4, 1681, Chester County replaced the Pennsylvania portion of New Netherland/New York's Upland. Chester County was one of the three Pennsylvania counties initially created by William Penn on August 24, 1682. Originally, the county's borders were Philadelphia County to the north, the Susquehanna River to the west, the Delaware River to the East, and Delaware and Maryland to the south.

The first county seat was in the city of Chester, but in 1788, it moved to Turk's Head (later named West Chester), a more central location to accommodate the increased population of the western part of the county. In 1789, the eastern part of the county separated from Chester County becoming Delaware County. A three-person Board of Commissioners administers Chester County government. With Pennsylvania being a commonwealth, many rights and duties reside with the municipal elected officials.

Chester County includes 73 municipalities with 57 townships, 15 boroughs, and 1 city. The first road "to the West" (Lancaster County) passed through the central part of Chester County, following the Great Valley westward, which later became known as U.S. Route 30. The first railroad (Pennsylvania Railroad) followed the same route as the Reading Railroad and proceeded up the Schuylkill River to Reading. Easy transportation allowed workers to commute to urban jobs and the rise of suburbs followed. There are several key transportation routes throughout the county. The population is clustered along the major transportation routes throughout the county, making transit into Philadelphia and other major metropolitan areas easier. Interstate 76 and Routes 1, 30, and 322 provide for eastbound and westbound travel throughout the county. U.S. Routes 100 and 202 provide for northbound and southbound travel. In addition to these major transportation routes, there are smaller Pennsylvania Routes that support regional transport.

Throughout the mid-19th and 20th century, Chester County was largely rural with farms, mills, and forges easily transporting goods such as corn, wheat, barley, oats, rye, buckwheat, and flax through the Pennsylvania Railroad that linked the county's central valley to Philadelphia. Just before the Civil War, investors built the Philadelphia & Baltimore Central Railroad in the middle of the county to link Philadelphia to the cities of Lancaster to the west and Baltimore to the south. This helped grow some town economies along the way as well. The West Chester Railroad in 1832 and the West Chester & Philadelphia Railroad in the 1850s also connected the towns within the county as well as to Philadelphia and Delaware. Agriculture served as the county's economic base as it operated within a mostly self-sufficient economy. As the demand for more meat and dairy rose and



transportation was available, the 1860 agricultural census showed that Chester County's 50,000 cattle were used for beef and dairy purposes. Plant cultivation also contributed significantly to the county economy with mushrooms being the best-known food crop. An iron industry also flourished because of the county's rich iron ore deposits and water power. During the Civil War, Phoenix Iron produced the Griffin Gun and became a major supplier of the Union Army.

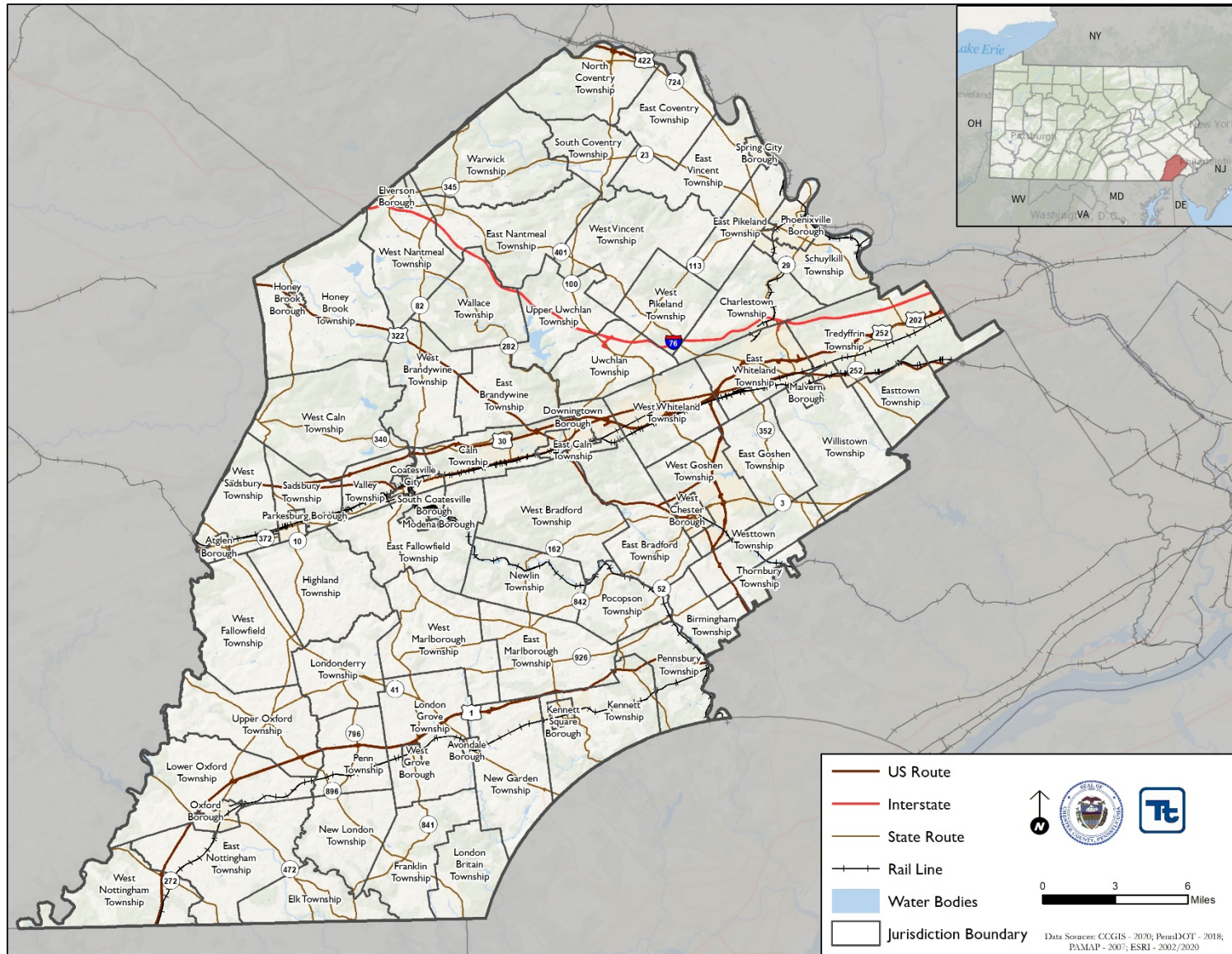
In 1950, the completion of the Pennsylvania Turnpike drastically altered development in the northeast region of the county. The turnpike initially provided only two exits within Chester County (Downingtown and Malvern/Phoenixville). These two exits became the focal points for growth along with Valley Forge/King of Prussia exit located in Montgomery County at the border with Chester County. Beginning in the 1970s, the stretch of Route 202 attracted hundreds of computer-related companies, biomedical research, and other service and information-based firms and drew thousands of new residents. Large-scale developments multiplied during the 1970s to the 1990s and Chester County lost over 50,000 acres of land to development.

Chester County's economy has traditionally been diverse and stable and employment has consistently been the best in the region. Chester County is comprised of some of the major employment centers of the metropolitan regions and is not dominated by a single industry. It is no longer a bedroom suburb of the city. In the eastern and central sectors of the county, there has been an increase of corporate headquarters, industrial parks, and businesses. Commercial land uses are concentrated in the urban centers, such as Coatesville City and the boroughs along major highways such as Route 202 and Route 30. Industrial land use is extensive in Coatesville, Downingtown, West Chester, and Phoenixville, the county's urban centers.

Chester County has experienced a population boom over the past decade. From its first federal census numbers of 1790, Chester County's population grew from 27,937 to 498,886 as of the 2010 Census and 517,156 as of the 2018 Census Estimates (U.S. Census Bureau, 2019). Today, it is Pennsylvania's 28th largest county in terms of land area and is the 7th largest county in the Commonwealth in terms of population.



Figure 2-1. Base Map of Chester County





2.3 POPULATION AND DEMOGRAPHICS

Population and demographic data provide baseline information about residents. Changes in demographics or population may be used to identify higher-risk populations. Maintaining up-to-date data on demographics will allow Chester County to better assess magnitudes of hazards and develop more specific mitigation plans. According to the 2010 U.S. Census, Chester County had a population of 498,886, which represented a 13 percent decrease from the 2000 U.S. Census population of 433,501. According to the 2018 U.S. Census, Chester County had a population of 517,156 which represented a 19.3 percent increase from the population in 2010. Table 2-1 presents the population statistics for Chester County based on the 2000 and 2010 U.S. Census, and 2018 estimates (the most current available) data. Table 2-2 provides details regarding demographics for Chester County.

Table 2-1. Chester County Population Statistics

Municipality	2000 Census	2010 Census	2018 Estimate	Population Change 2000-2018	Population Change 2000-2018 (%)	Population Density Per Square Mile (2018)
Atglen Borough	1,217	1,406	1,459	242	19.9%	1653
Avondale Borough	1,108	1,265	1,295	187	16.9%	2632
Birmingham Township	4,221	4,208	4,207	14	0.3%	645
Caln Township	11,916	13,817	14,198	2,282	19.1%	1593
Charlestown Township	4,051	5,671	5,813	1,762	43.5%	464
Coatesville City	10,838	13,100	13,147	2,309	21.3%	7190
Downingtown Borough	7,589	7,891	7,929	340	4.5%	3565
East Bradford Township	9,405	9,942	9,959	554	5.9%	657
East Brandywine Township	5,822	6,742	8,416	2,594	44.6%	748
East Caln Township	2,857	4,838	4,876	2,019	70.7%	1325
East Coventry Township	4,566	6,636	6,770	2,204	48.3%	621
East Fallowfield Township	5,157	7,449	7,567	2,410	46.7%	485
East Goshen Township	16,824	18,026	18,199	1,375	8.2%	1791
East Marlborough Township	6,317	7,026	7,326	1,009	16.0%	471
East Nantmeal Township	1,787	1,803	1,723	64	3.6%	105
East Nottingham Township	5,516	8,650	8,929	3,413	61.9%	443
East Pikeland Township	6,551	7,079	7,331	780	11.9%	824
East Vincent Township	5,493	6,821	7,062	1,569	28.6%	777
East Whiteland Township	9,333	10,650	11,415	2,082	22.3%	642
Easttown Township	10,270	10,477	10,603	333	3.2%	1380
Elk Township	1,485	1,681	1,786	301	20.3%	176
Elverson Borough	959	1,225	1,405	446	46.5%	1398
Franklin Township	3,850	4,352	4,506	656	17.0%	343
Highland Township	1,125	1,272	1,370	245	21.8%	80
Honey Brook Borough	1,287	1,713	1,865	578	43.8%	3889
Honey Brook Township	6,278	7,647	8,205	1,927	30.7%	326
Kennett Square Borough	5,273	6,072	6,159	886	16.8%	529



Municipality	2000 Census	2010 Census	2018 Estimate	Population Change 2000-2018	Population Change 2000-2018 (%)	Population Density Per Square Mile (2018)
Kennett Township	6,451	7,565	8,177	1,726	26.8%	5745
London Britain Township	2,797	3,139	3,241	444	15.9%	330
London Grove Township	5,265	7,475	8,615	3,350	63.6%	142
Londonderry Township	1,632	2,149	2,450	818	50.1%	758
Lower Oxford Township	4,319	5,200	5,058	739	17.1%	274
Malvern Borough	3,059	2,998	3,440	381	12.4%	2,715
Modena Borough	610	535	873	263	43.1%	2,472
New Garden Township	9,083	11,984	12,111	3,028	33.3%	744
New London Township	4,583	5,631	5,921	1,338	29.2%	112
Newlin Township	1,150	1,285	1,312	162	14.1%	489
North Coventry Township	7,381	7,866	7,996	615	8.3%	592
Oxford Borough	4,315	5,077	5,420	1,105	25.6%	2,757
Parkesburg Borough	3,373	3,593	3,781	408	12.1%	2,968
Penn Township	2,812	5,364	5,511	2,699	96.0%	571
Pennsbury Township	3,500	3,604	3,649	149	4.2%	362
Phoenixville Borough	14,788	16,440	16,815	1,652	13.7%	4,525
Pocopson Township	3,350	4,582	4,838	1,488	44.4%	581
Sadsbury Township	2,582	3,570	3,919	1,337	51.8%	632
Schuylkill Township	6,960	8,516	8,639	1,679	24.1%	970
South Coatesville Borough	997	1,303	1,276	279	28.0%	724
South Coventry Township	1,895	2,604	2,631	736	38.9%	346
Spring City Borough	3,305	3,323	3,320	15	0.4%	4,044
Thornbury Township	2,678	3017	3,181	503	18.8%	824
Tredyffrin Township	29,062	29,332	29,481	419	1.4%	1,485
Upper Oxford Township	2,095	2,484	2,518	423	20.2%	151
Upper Uwchlan Township	6,850	11,227	11,509	4,659	68.0%	982
Uwchlan Township	16,576	18,088	18,869	2,293	13.8%	1,805
Valley Township	5,116	6,794	7,661	2,545	49.8%	1,284
Wallace Township	3,240	3,458	3,678	438	13.5%	304
Warwick Township	2,556	2,507	2,543	13	.50%	135
West Bradford Township	10,775	12,223	12,869	2,094	19.4	692
West Brandywine Township	7,153	7,394	7,482	329	4.6	564
West Caln Township	7,054	9,014	9,080	2,026	28.7%	414
West Chester Borough	17,861	18,461	19,888	2,027	11.3%	10,771
West Fallowfield Township	2,485	2,566	2,596	111	4.5%	142
West Goshen Township	20,495	21,866	23,021	2,526	12.3%	1,918
West Grove Borough	2,652	2,854	2,846	194	7.3%	4,372
West Marlborough Township	859	814	771	88	10.2%	45



Municipality	2000 Census	2010 Census	2018 Estimate	Population Change 2000-2018	Population Change 2000-2018 (%)	Population Density Per Square Mile (2018)
West Nantmeal Township	2,031	2,170	1,999	32	1.6%	148
West Nottingham Township	2,634	2,722	2,718	84	3.2%	195
West Pikeland Township	3,551	4,024	4,069	518	14.6%	409
West Sadsbury Township	2,444	2,444	2,393	51	2.1%	225
West Vincent Township	3,170	4,567	5,257	2,087	65.8%	295
West Whiteland Township	16,499	18,274	18,403	1,904	11.5%	1,424
Westtown Township	10,352	10,827	10,916	564	5.4%	1,263
Willistown Township	10,011	10,497	10,895	884	8.8%	597
Chester County	433,501	498,886	517,156	83,655	19.3%	681

Sources: U.S. Census Bureau 2000, 2010, U.S. Census Bureau 2014-2018

Table 2-2. Demographics for Chester County

Demographics	2000 Census	2010 Census	2018 Estimate
Total population	433,501	499,797	517,156
Male	212,739	246,073	254,746
Female	220,762	253,724	262,410
Median age (years)	36.9	39.3	40.4
Under 5 years	29,330	31,027	29,076
18 years and over	319,919	376,074	397,609
65 years and over	50,677	65,050	79,856
Total households	157,905	184,160	189,592
Group quarters population	14,744	13,336	14,354

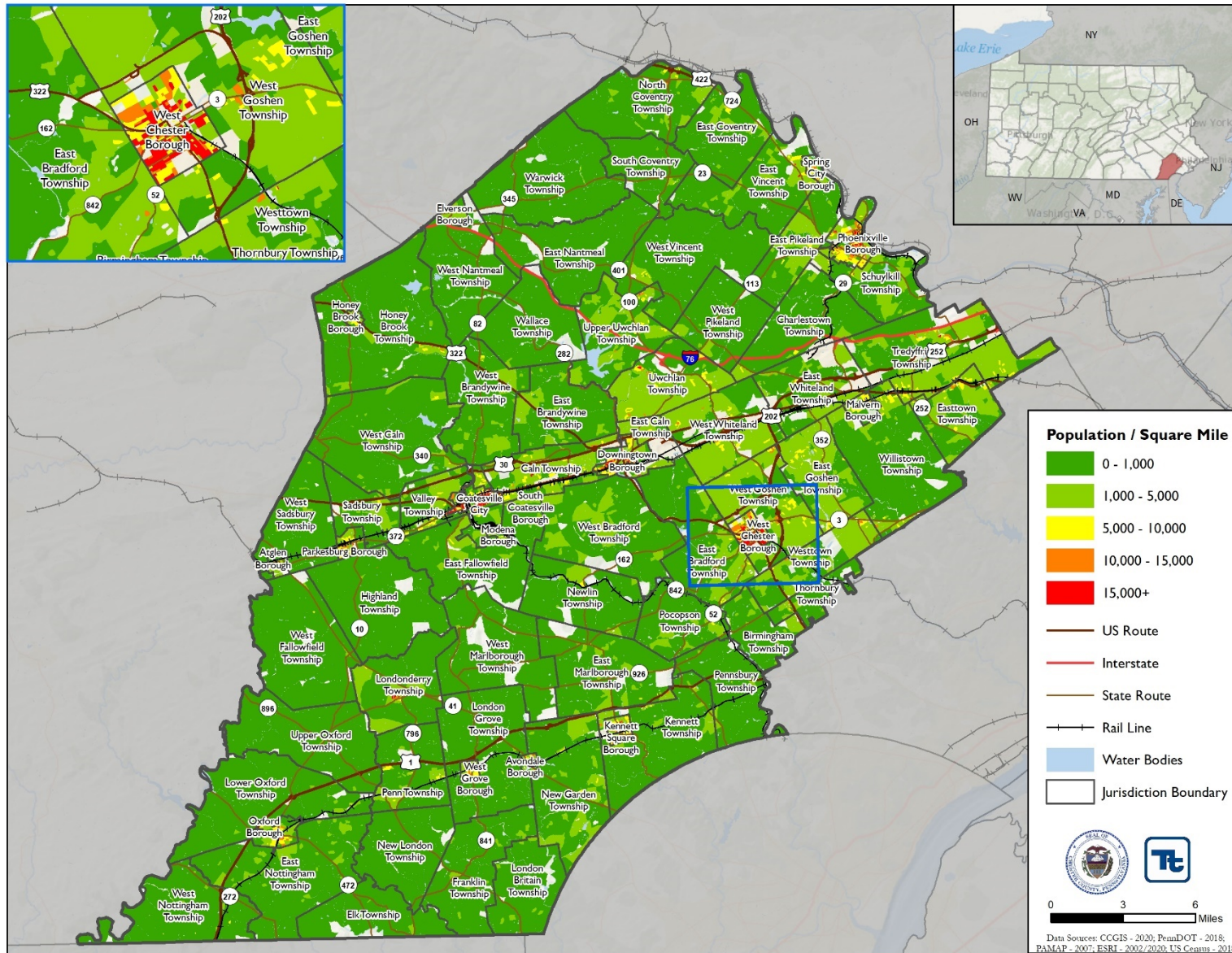
Sources: U.S. Census Bureau 2000, 2010, U.S. Census 2014-2018

As shown in the tables above, Chester County’s 2010 Census population was 433,501 and in 2018, 517,156. Based on the 2018 data, the population density of Chester County is 681 persons per square mile, which is considerably higher than the Pennsylvania statewide average of 284 persons per square mile. The Borough of West Chester has the highest population density of all the municipalities in the county (10,771 persons per square mile) (U.S. Census 2010). Most of the municipalities in Chester County have population densities above the statewide average. However, many municipalities in the county have low population density. Dispersing information, instructions, and resources during a disaster response effort to residents in low-density areas is more difficult than in more densely populated areas because individuals are not centralized. Chester County 2018 population density data is illustrated in Figure 2-2.

While low-density areas may provide challenges to disseminating hazard mitigation information, a low population density also means that hazards will not affect as many people. For example, diseases may not spread as quickly because citizens are in contact with less people. Similarly, fires are less likely to spread to other structures because of the large distances between them. The magnitude of an event is typically smaller in a less-populated area because each event affects fewer people and properties.



Figure 2-2. Chester County 2018 Population Distribution





The Disaster Mitigation Act of 2000 (DMA 2000) requires that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events based on several factors, including their physical and financial ability to react to or respond during a hazard and the location and construction quality of their housing. For the purposes of this study, vulnerable populations shall include (1) the elderly and younger populations (persons aged 65 and over; persons aged 5 and younger) and (2) those living in low-income households.

Approximately 15.4 percent of the county's total population is aged 65 and older (U.S. Census, 2018). Older residents may have access and functional needs. For example, many may be unable to drive; therefore, special evacuation plans may be necessary. They may also have hearing or vision impairments that could make receiving emergency instructions difficult. Additionally, 5.6 percent of the county's total population is under the age of 5 years (U.S. Census 2018). Both older and younger populations have higher risks for contracting certain diseases. The county's combined population under 5 years of age and over 65 years represent approximately 21.1 percent of its total population.

Figure 2-3 and Figure 2-4 illustrate the distribution of these populations for Chester County.



Figure 2-3. Chester County 2018 Population Over 65 Years

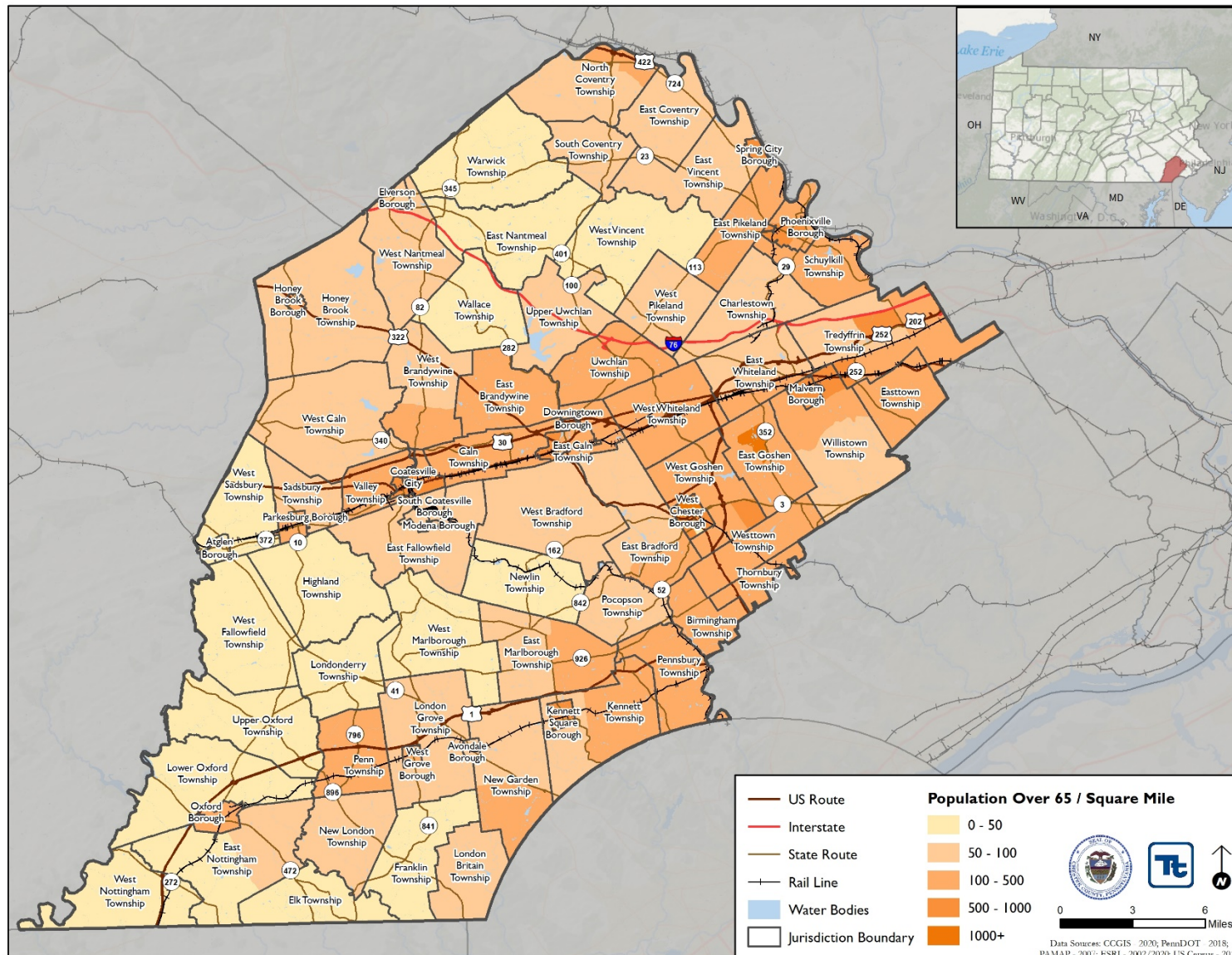
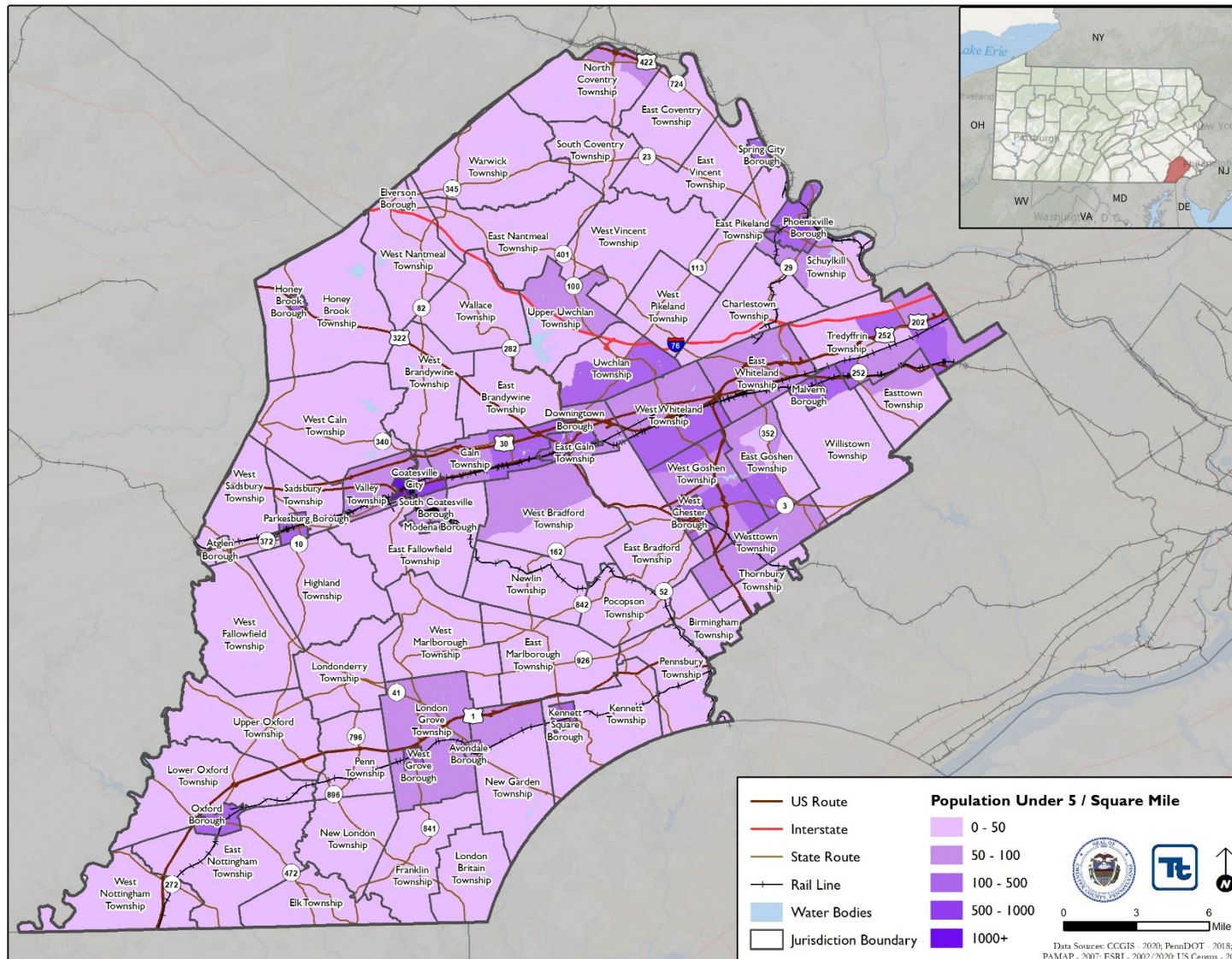




Figure 2-4. Chester County 2018 Population Under 5 Years





Only 2.8 percent of Chester County’s population lives in group quarters. The term “group quarters” refers to people living in communal settings, which can include inmates in a prison, students in a dorm, or elderly or mentally disabled individuals living in group care homes. Residents living in group quarters are often special needs populations. It is important to ensure that each group quarter facility has its own emergency plan to account for the unique needs of its residents during a hazard event.

Table 2-3 provides population estimates and projections for each municipality in Chester County and for the county as a whole. The population of the entire county is estimated to be 647,330 by the year 2040, which represents a net population increase of 213,818 people (29.8 percent) in a 30-year period. As shown in the table below, 69 municipalities in Chester County are projected to see an increase in population. The table also shows that Modena Borough, Spring City Borough, Warwick Township, and West Marlborough Township are projected to see a decrease in population. It should be noted that changes in population or demographics may be used to identify higher-risk populations. Maintaining up-to-date data on demographics will allow Chester County to better assess magnitudes of hazards and develop more specific mitigation plans and strategies.

Table 2-3. Chester County Population Projections by Municipality

Municipality	2000 Census	2010 Census	Population Change 2000-2010 (%)	2020 Projection	2030 Projection	2040 Projection	Projected Population Change 2010-2040 (%)
Atglen Borough	1,217	1,406	15.5	1,654	1,868	2,102	49.5
Avondale Borough	1,108	1,265	14.2	1,420	1,577	1,732	36.9
Birmingham Township	4,221	4,208	-0.3	4,951	5,261	5,819	38.3
Caln Township	11,916	13,817	15.9	14,585	16,001	17,047	23.4
Charlestown Township	4,051	5,671	40.0	6,672	7,849	8,926	57.4
Coatesville City	10,838	13,100	20.9	13,955	15,614	16,814	28.3
Downingtown Borough	7,589	7,891	4.0	7,929	8,118	8,221	4.18
East Bradford Township	9,405	9,942	5.7	11,696	12,755	14,212	42.9
East Brandywine Township	5,822	6,742	15.8	7,504	8,356	9,156	35.8
East Caln Township	2,857	4,838	69.3	5,692	6,696	7,615	57.4
East Coventry Township	4,566	6,636	45.3	7,589	8,929	10,048	51.4
East Fallowfield Township	5,157	7,449	44.4	8,764	10,310	11,724	57.4
East Goshen Township	16,824	18,026	7.1	19,505	20,825	22,236	23.3
East Marlborough Township	6,317	7,026	11.2	8,208	9,119	10,185	45.0
East Nantmeal Township	1,787	1,803	0.89	2,004	2,099	2,254	25.0
East Nottingham Township	5,516	8,650	56.8	10,176	11,972	13,614	57.4
East Pikeland Township	6,551	7,079	8.0	7,720	8,297	8,910	25.9
East Vincent Township	5,493	6,821	24.2	8,025	9,299	10,534	54.4
East Whiteland Township	9,333	10,650	14.1	11,749	12,972	14,124	32.6
Easttown Township	10,270	10,477	2.0	10,966	11,293	11,293	7.8



Municipality	2000 Census	2010 Census	Population Change 2000-2010 (%)	2020 Projection	2030 Projection	2040 Projection	Projected Population Change 2010-2040 (%)
Elk Township	1,485	1,681	13.2	1,968	2,204	2,469	46.9
Elverson Borough	959	1,225	27.7	1,441	1,686	1,914	56.2
Franklin Township	3,850	4,352	13	5,120	5,736	6,439	47.9
Highland Township	1,125	1,272	13	1,293	1,386	1,437	13
Honey Brook Borough	1,287	1,713	33.1	1,954	2,299	2,585	50.9
Honey Brook Township	6,278	7,647	21.8	8,707	9,944	11,080	44.9
Kennett Square Borough	5,273	6,072	15.1	6,446	7,063	7,541	24.2
Kennett Township	6,451	7,565	17.3	8,900	10,109	11,390	50.6
London Britain Township	2,797	3,139	12.2	3,358	3,647	3,895	24.1
London Grove Township	5,265	7,475	42	8,794	10,346	11,795	57.8
Londonderry Township	1,632	2,149	31.7	2,528	2,974	3,382	57.4
Lower Oxford Township	4,319	5,200	20.4	6,118	7,014	7,923	52.4
Malvern Borough	3,059	2,998	-2	3,038	3,020	3,035	1.2
Modena Borough	610	535	-12.3	530	482	459	-14.2
New Garden Township	9,083	11,984	31.9	14,099	16,587	18,862	57.4
New London Township	4,583	5,631	22.9	6,625	7,649	8,656	53.7
Newlin Township	1,150	1,285	11.7	1,376	1,492	1,594	24
North Coventry Township	7,381	7,866	6.6	8,002	8,338	8,560	8.8
Oxford Borough	4,315	5,077	17.6	5,716	6,425	7,093	39.7
Parkesburg Borough	3,373	3,593	6.5	3,911	4,173	4,468	24.3
Penn Township	2,812	5,364	90.7	6,311	7,424	8,442	57.4
Pennsbury Township	3,500	3,604	3	3,748	3,869	4,003	11.1
Phoenixville Borough	14,788	16,440	11.2	16,989	18,168	18,988	15.5
Pocopson Township	3,350	4,582	36.8	5,158	6,068	6,787	16.0
Sadsbury Township	2,582	3,570	38.3	4,035	4,747	5,317	48.9
Schuylkill Township	6,960	8,516	22.3	9,995	11,519	13,017	52.8
South Coatesville Borough	997	1,303	30.7	1,418	1,642	1,803	38.4
South Coventry Township	1,895	2,604	37.4	3,030	3,564	4,037	55.0
Spring City Borough	3,305	3,323	0.54	3,258	3,240	3,195	-3.8
Thornbury Township	2,678	3,017	12.6	3,549	3,971	4,456	47.7
Tredyffrin Township	29,062	29,332	0.93	30,039	30,496	31,095	6.01
Upper Oxford Township	2,095	2,484	18.6	2,922	3,333	3,759	51.3
Upper Uwchlan Township	6,850	11,227	63.9	13,208	15,539	17,670	57.4



Municipality	2000 Census	2010 Census	Population Change 2000-2010 (%)	2020 Projection	2030 Projection	2040 Projection	Projected Population Change 2010-2040 (%)
Uwchlan Township	16,576	18,088	9.12	20,780	22,798	25,201	39.3
Valley Township	5,116	6,794	32.8	7,993	9,403	10,693	57.4
Wallace Township	3,240	3,458	6.7	3,951	4,287	4,712	36.3
Warwick Township	2,556	2,507	-1.9	2,475	2,433	2,397	-4.4
West Bradford Township	10,775	12,223	13.4	13,054	14,238	15,221	24.5
West Brandywine Township	7,153	7,394	3.4	8,165	8,634	9,275	27.1
West Caln Township	7,054	9,014	27.8	10,375	12,078	13,585	50.7
West Chester Borough	17,861	18,461	3.3	18,615	19,024	19,288	4.5
West Fallowfield Township	2,485	2,566	3.2	2,682	2,779	2,886	12.5
West Goshen Township	20,495	21,866	6.7	23,832	25,459	27,279	24.5
West Grove Borough	2,652	2,854	7.6	3,240	3,521	3,862	34.1
West Marlborough Township	859	814	-5.2	786	748	716	-12
West Nantmeal Township	2,031	2,170	6.8	2,271	2,394	2,505	15.4
West Nottingham Township	2,634	2,722	3.3	3,017	3,194	3,439	26.3
West Pikeland Township	3,551	4,024	13.3	4,734	5,309	5,961	48.1
West Sadsbury Township	2,444	2,444	0	2,606	2,676	2,798	14.5
West Vincent Township	3,170	4,567	44	5,373	6,321	7,188	57.4
West Whiteland Township	16,499	18,274	10.7	21,375	23,719	26,495	45
Westtown Township	10,352	10,827	4.6	11,268	11,728	12,177	12.5
Willistown Township	10,011	10,497	4.8	11,066	11,587	12,136	15.6
Chester County	433,512	498,886	15	538,809	607,407	647,330	29.8

Sources: U.S. Census 2000, 2010, and 2018

According to the 2014-2018 American Community Survey, 11.7 percent of the county’s population speaks a language other than English, with 4.1 percent of the population speaking English less than “very well.” While currently a low percentage, future hazard mitigation strategies should consider addressing language barriers to ensure that all residents can receive emergency instructions. Table 2-4 summarizes race and ethnicity population information for Chester County.

Table 2-4. Race and Ethnicity in Chester County

Race and Ethnicity	2010	% of Population	2018	% of Population
One race	489,856	98.2	506,087	97.9%
White	426,707	85.5	441,326	85.3%
Black or African American	30,623	6.1	30,706	5.9%
American Indian and Alaska Native	862	0.2	557	0.1%



Race and Ethnicity	2010	% of Population	2018	% of Population
Asian	19,296	3.9	29,777	5.2%
Native Hawaiian and Other Pacific Islander	161	0.0	120	0%
Some other race	12,207	2.4	6,601	1.3%
Two or more races	9,030	1.8	11,069	2.1%
Foreign born	28,943	5.9%	49,664	9.6%
Speak a language other than English	55,925	11.4%	60,553	12.4%
Hispanic or Latino	32,503	6.5	37,858	4.2%

Source: U.S. Census Bureau 2010, ACS 2014-2018 5-year estimates

Chester County contains 199,050 housing units. These properties may be vulnerable to various natural hazards, particularly those located in defined hazard areas. Damage to residential properties is not only costly to repair or rebuild but devastating to the displaced residents.

According to the U.S. Census, approximately 4.7 percent of the county’s residential properties are vacant. Most vacancies are from units available for rent. Vacant buildings are particularly vulnerable to arson and criminal activity. Because vacant properties are not inhabited year-round or may not be adequately maintained, many are structurally deficient and at risk of collapse.

Approximately 24.8 percent of the county’s population live in rented homes. Because renters are more transient than homeowners, communicating with renters may be more difficult than communicating with homeowners. Similarly, communications with tourists would be harder during an emergency event. Communication strategies should be developed to ensure that these populations receive proper notifications.

Table 2-5 summarizes characteristics of the residential properties in Chester County.

Table 2-5. Housing Characteristics in Chester County

Housing Characteristics	2010	2018
Total housing units	192,462	199,050
Owner-occupied housing units	139,328	142,649
Renter-occupied housing units	43,572	46,943
Vacant housing units	9,562	9,458
Median value (dollars)	\$334,300	\$347,000
Housing units with a mortgage	105,549	99,716
Housing units without a mortgage	33,779	42,933

Source: U.S. Census Bureau 2010, 2011, 2018

In 2018 (the most current data available), the median household income in the county was \$92,417, which was higher than the Commonwealth of Pennsylvania’s estimated median household income (\$60,905). The county’s 2017 estimated per capita income of \$46,256 was slightly higher than the Commonwealth’s 2017 estimated per capita income of \$31,476. Approximately 4 percent of family incomes in Chester County were below poverty level, and 6.8 percent of individual incomes were below poverty level. Emergency responders may have difficulty connecting with individuals within this economic bracket for several reasons, including less access to the Internet within these communities. Additionally, some low-income families and individuals may not own vehicles, and therefore could be more vulnerable during an evacuation. Table 2-6 summarizes economic characteristics of Chester County’s population and population distribution of residents with incomes below the poverty level.



Table 2-6. Economic Characteristics in Chester County

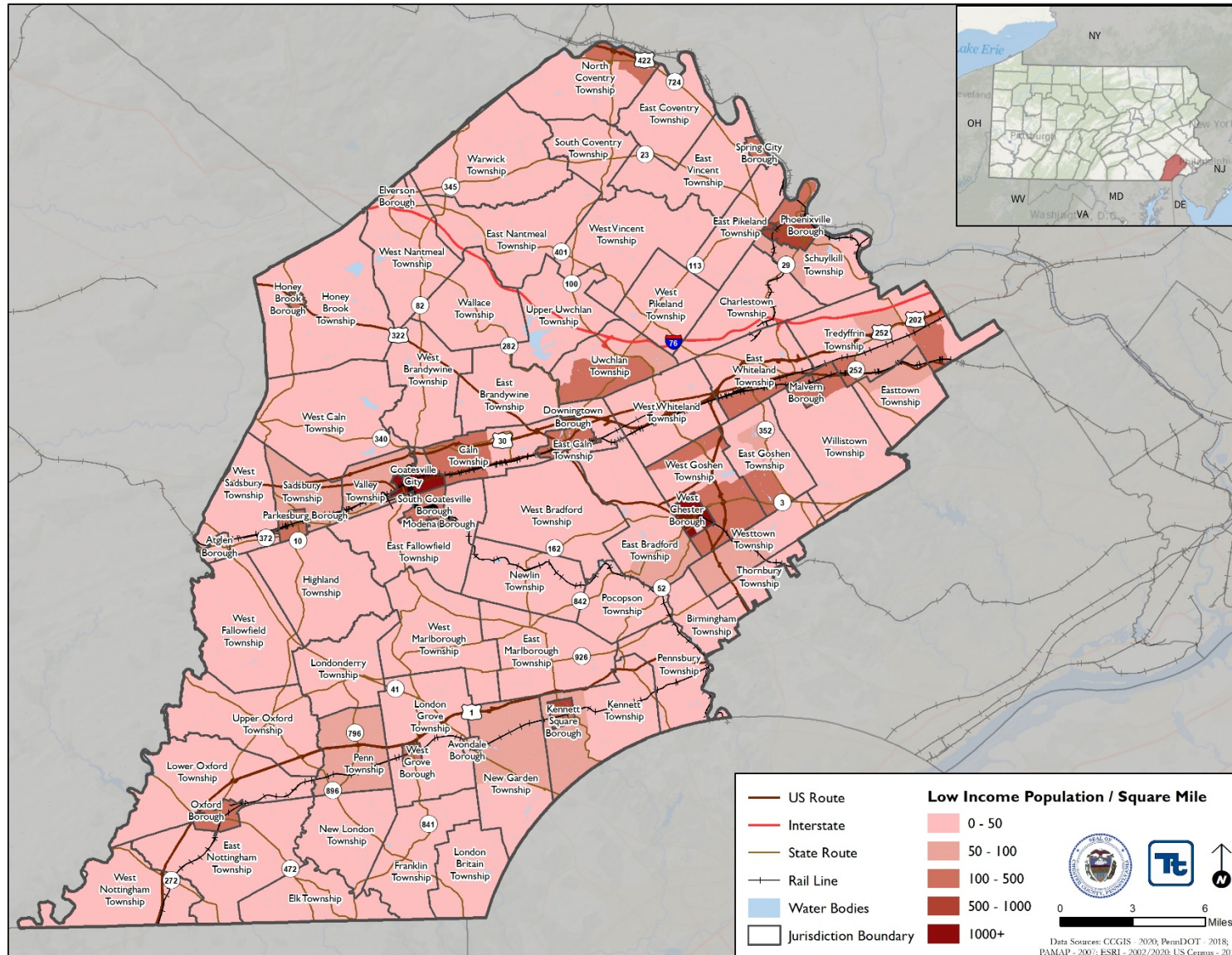
Economic Characteristics	2010 Census	2018 Estimates
Median household income	\$84,741	\$96,726
Median family income	\$101,760	\$117,559
Per capita income	\$41,251	\$49,225
Families with income below the poverty level	5,030	6,236
Individuals with income below the poverty level	29,972	34,217

Source: U.S. Census 2010, 2011, 2018

Figure 2-5 illustrates population distribution for residents with incomes below the poverty level.



Figure 2-5. Chester County 2018 Population Below the Poverty Level



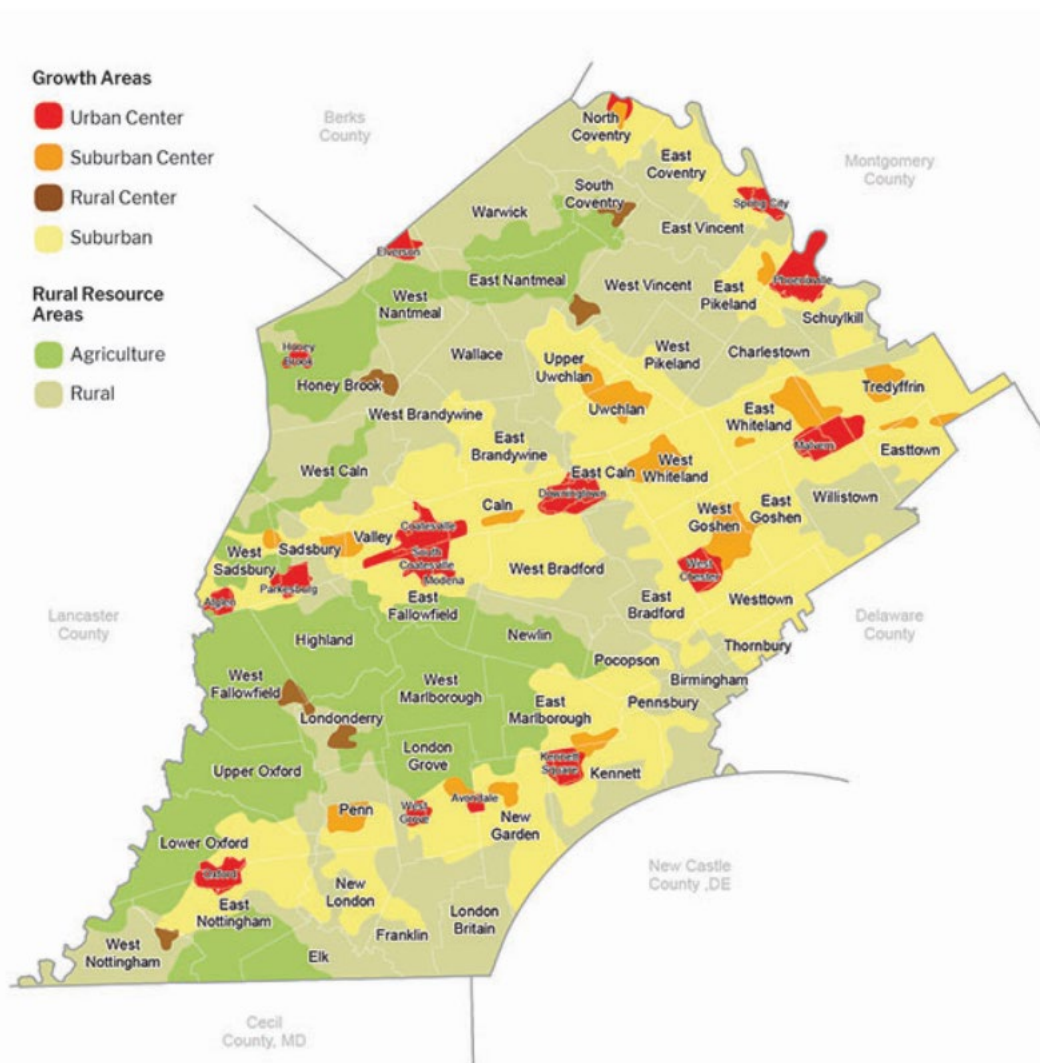


2.4 LAND USE AND DEVELOPMENT

Chester County's land use patterns are influenced by its topography and existing infrastructure. The existing land use pattern reflects suburban expansion from Philadelphia into eastern Chester County, making the eastern side into a more urban area. The rest of Chester County reflects the continued spread of residential development into rural areas making them suburban in character. A good portion of Chester County is still used for agriculture, but the major portion of the county's economy is spread through the trade and manufacturing industries. Most development in Chester County is concentrated in the eastern part of the county and along Route 30 through the center of the county and along Route 1 in the south. There is a high density of employment in Tredyffrin, East Whiteland, West Whiteland, Uwchlan, East Goshen, West Goshen, and West Chester. Outside of those areas, the county is composed of small towns and residential neighborhoods interspersed with farms, and forested lands. Locations for development are primarily located along the major transportation corridors in more populated areas and underutilized properties to provide viable options to potential new businesses. The intention is to create a countywide redevelopment program to revitalize underutilized properties, retain and expand existing businesses, and create new businesses, as well as market the county's location and amenities. (Chester County 2018). Figure 2-6 below illustrates the identified development-ready areas in Chester County originally shown in the 2018 Chester County Comprehensive Plan.



Figure 2-6. Potential Growth Areas Identified in the 2018 Chester County Comprehensive Plan



Source: Chester County 2018

The 2018 Chester County Comprehensive Plan establishes a balance of growth and preservation for the county, municipalities, the public, and the business community through guiding decision making and local municipal planning and implementation. The plan incorporates smart growth principles and promotes programs that build community and environmental resiliency. Land use regulations across Chester County have adopted extremely specific land use classifications, which therefore limit the flexibility of development leading to outward expansion and lower density development, which institutes a de facto dependence on vehicle transportation. The Chester County Comprehensive Plan identifies various areas throughout the county that can be used for urban, suburban, rural, and agriculture. Implementation of Smart Code Zoning allows stakeholders to visualize land use patterns and make better-informed decisions in addition to having the capability to allow for scalable implementation of land use regulations. The Chester County Planning Commission is working with the HMP Steering Committee to work to create and implement local land use plans consistent with the Smart Code Approach.

According to the U.S. Geologic Survey’s National Land Cover Dataset, the primary land cover classification of Chester County is agricultural land (35 percent of area), wooded or underdeveloped land (29 percent), and



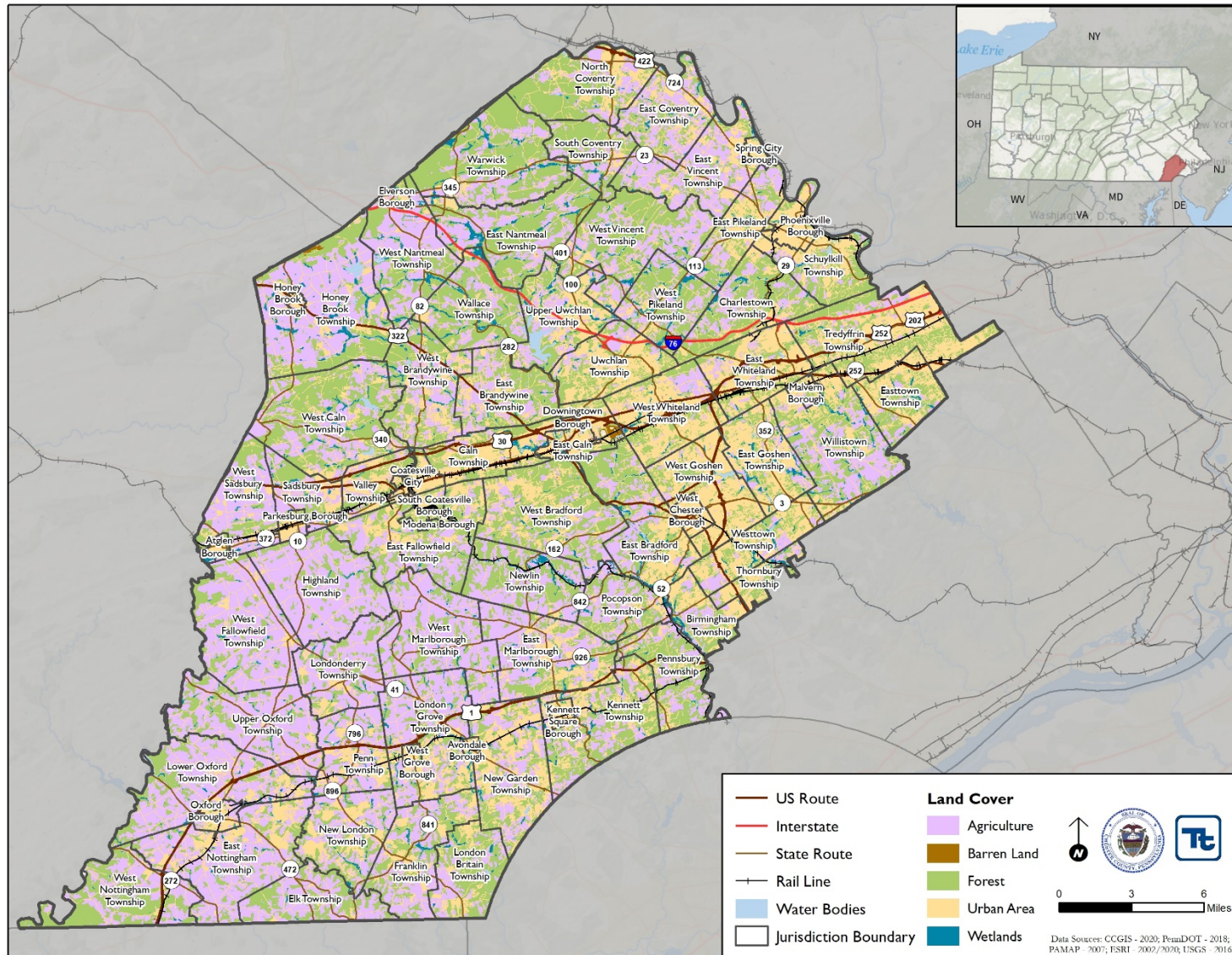
residential land (27 percent of area). The northern half of Chester County is primarily composed of forested land. Agricultural land is located in the southern part of the county and residential land is mostly located in the center and eastern parts of the county.

Between 2012 and 2017, agricultural land use decreased by 5 percent, but the market value of products sold increased by 13 percent. The total sum of agricultural land and market value of products sold increased from 2012 to 2017 (USDA 2020). Utilization of the considerable agricultural land across the county for agritourism may help family-owned or smaller farming operations increase profitability and work to retain employment opportunities and maintain the agricultural base of Chester County. Chester County’s Agricultural Land Preservation Board (ALPB) was established in 1989. “The Agricultural Land Preservation Board administers the Commonwealth Agricultural Conservation Easement Purchase Program and the Chester County Challenge Grant Program. The easement programs ensure preservation of viable agricultural lands to protect the agricultural economy and resources of the County. The Chester County program has been approved by the Pennsylvania Department of Agriculture and operates within the guidelines of the Agricultural Security Area Law (PA Act 43, P.L. 128, No. 43) (ALPB N.d).”

Figure 2-7 shows the county land use and land cover.



Figure 2-7. Chester County Land Use and Land Cover





2.5 DATA SOURCES AND LIMITATIONS

The County Profile section of this HMP was developed with information from the following sources:

1. Chester County Comprehensive Plan (Chester County 2018)
2. Pennsylvania Department of Environmental Protection Population Projections Report (PA DEP n.d.)
3. U.S. Census Bureau. 2010
4. U.S. Census Bureau. 2011. 2014-2018 American Community Survey 5-Year Estimates Chester County.
5. U.S. Census Bureau. 2018. 2014-2018 American Community Survey 5-Year Estimates Chester County.
6. Chester County Planning Division. 2020.
7. United States Department of Agriculture. 2020. 2012 Census of Agriculture: Chester County, Pennsylvania County Profile.
8. United States Department of Agriculture. 2020. 2017 Census of Agriculture: Chester County, Pennsylvania County Profile.
9. Chester County Agricultural Land Preservation Board (ALPB N.d.)

Data sources used to develop the HMP, in general, are listed in Section 1.4 and Appendix A. Data sources used to perform geographic information system (GIS) analysis for the risk assessment are listed in Section 4.1. These sources were key in understanding the current demographic makeup of the communities as well as in framing the foundation of the HMP. The sources listed provided the underlying context of the HMP and allowed the Planning Team to understand critical vulnerabilities in the county. Throughout the course of the planning process, the Steering Committee continually sought additional data sources to augment the information included in the HMP. The Steering Committee made multiple requests for existing jurisdictional documents (e.g., jurisdictional hazard mitigation plans and other relevant information). Despite multiple requests for municipal documents, the response was somewhat limited.



SECTION 3 PLANNING PROCESS

A successful planning process builds partnerships and brings together members representing government agencies, the public, and other stakeholders to reach consensus on ways the community will prepare for and respond to those hazards most likely to occur. Applying a comprehensive and transparent process adds validity to the Hazard Mitigation Plan (HMP). Participants involved in the HMP planning process gained better understanding of problems and issues and helped devise solutions and actions for the community, resulting in a revised set of common community values and widespread support for directing financial, technical, and human resources to agreed-upon actions.

The planning process was an integral part of updating the Chester County HMP. This section describes the planning process used to update the HMP with participation from all 73 of the county's municipalities. This section also describes the Hazard Mitigation Steering Committee, Planning Team, meetings and documentation, public and stakeholder participation, multi-jurisdictional planning, and existing planning mechanisms implemented during the HMP update process. Additional details about the process of updating each section of this HMP appear at the beginning of those sections.

3.1 UPDATE PROCESS AND PARTICIPATION SUMMARY

In accordance with the Disaster Mitigation Act of 2000 (DMA 2000) requirements, this plan documents the following topics:

- Planning process
- Hazard identification
- Risk assessment
- Mitigation strategy: goals, actions, and projects
- Formal adoption by the participating jurisdictions
- Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA) approval

The 2020 PEMA Hazard Mitigation Plan Standard Operating Guide (2020 SOG) lays out the standard planning process in Pennsylvania to create and update HMPs (including this HMP), and is cited in Appendix A, under Authorities and References. Hazard vulnerabilities and the risk assessment are described in Section 4 (Risk Assessment), and the mitigation strategy is described in Section 5 (Mitigation Strategy) of this HMP.

Public participation and planning meetings served as the main forum for gathering information to update the HMP. The Steering Committee and Planning Team were afforded access to information in relevant and approved plans, policies, and procedures for Chester County. Opportunities for public participation included two public meetings, distribution of information at municipal meetings, and chances to review and comment on the draft HMP update. To develop all sections of the HMP, the Planning Team used meetings, e-mail correspondence, and teleconferences to solicit input from county, municipal, and other stakeholders, including members of the general public. Most information received for this update came from Chester County, its municipalities, and the Steering Committee. Through this planning process, the county established a comprehensive approach to reduce the effects of hazards on the county and its municipalities.

3.2 THE PLANNING TEAM

Recognizing the need to manage risk within the county, and to meet the requirements of the DMA 2000, the Chester County Department of Emergency Services led the update to the 2015 HMP. Ms. Gabby Ratliff, Community Resilience Coordinator, developed a Steering Committee to provide guidance and direction to the planning effort and to ensure the resulting document will be embraced both politically and by the constituency





within the planning area. Ms. Ratliff served as chair of the Steering Committee and the lead planner and point of contact for the planning process. The Steering Committee was composed of the following individuals:

- Alison Miller, Director, Planning and Logistics, Chester County Department of Emergency Services (DES)
- Tony Przychodzien, Radiological Emergency Preparedness Coordinator, Chester County DES
- Gabby Ratliff, Community Resilience Coordinator, Chester County DES
- Dave Sekkes, GIS Database Administrator, Chester County DES
- William Turner, Deputy Director, Emergency Management, Chester County DES
- Robyn Slater, Planner, Chester County Health Department
- Chris Patriarca, Senior Community Planner, Chester County Planning Commission
- Carol Stauffer, Assistant Director, Chester County Planning Commission
- Craig Thomas, Field Engineering and Operations Manager, Chester County Water Resources Authority
- Cory Trego, Water Resources Planner, Chester County Water Resources Authority
- Tim Hubbard, Emergency Management Coordinator (EMC) for Charlestown Township, and Chief Security Officer for the Downingtown Area School District
- Stefanie Chumley, Planner, Tetra Tech, Inc (Tetra Tech)
- Tony Subbio, Project Manager, Tetra Tech

The Steering Committee was charged with the following tasks:

- Providing guidance and overseeing the planning process on behalf of the general planning partnership (Planning Team).
- Attending and participating in meetings.
- Assisting with the development and completion of certain planning elements, including:
 - Reviewing and updating the hazards of concern
 - Developing a public and stakeholder outreach program
 - Assuring the data and information used in the plan update process is best available
 - Reviewing and updating the hazard mitigation planning goals and objectives
 - Identifying and screening of appropriate mitigation strategies and activities
 - Reviewing and updating plan maintenance procedures
- Reviewing and commenting on plan documents prior to submission to PEMA and FEMA.

A Planning Team was assembled to represent each of the municipalities participating in the HMP update as well as invited stakeholders and members of the Steering Committee. The following organizations were invited to participate on the Planning Team:

Chester County Municipalities				
Atglen Borough	East Pikeland Township	Lower Oxford Township	South Coatesville Borough	West Fallowfield Township
Avondale Borough	East Vincent Township	Malvern Borough	South Coventry Township	West Goshen Township
Birmingham Township	East Whiteland Township	Modena Borough	Spring City Borough	West Grove Borough
Caln Township	Easttown Township	New Garden Township	Thornbury Township	West Marlborough Township
Charlestown Township	Elk Township	New London Township	Tredyffrin Township	West Nantmeal Township
Coatesville City	Elverson Borough	Newlin Township	Upper Oxford Township	West Nottingham Township
Downingtown Borough	Franklin Township	North Coventry Township	Upper Uwchlan Township	West Pikeland Township
East Bradford Township	Highland Township	Oxford Borough	Uwchlan Township	West Sadsbury Township





East Brandywine Township	Honey Brook Borough	Parkesburg Borough	Valley Township	West Vincent Township
East Caln Township	Honey Brook Township	Penn Township	Wallace Township	West Whiteland Township
East Coventry Township	Kennett Square Borough	Pennsbury Township	Warwick Township	Westtown Township
East Fallowfield Township	Kennett Township	Phoenixville Borough	West Bradford Township	Willistown Township
East Goshen Township	London Britain Township	Pocopson Township	West Brandywine Township	
East Marlborough Township	London Grove Township	Sadsbury Township	West Caln Township	
East Nantmeal Township	Londonderry Township	Schuylkill Township	West Chester Borough	
Schools and School Districts				
Avon Grove School District	Downingtown Area School District	Owen J Roberts School District	Renaissance Charter Academy	Unionville-Chadds Ford School District
Bishop Shanahan High School	Great Valley School District	Oxford School District	Saint Patrick School	Villa Maria Academy High School
Chester County Intermediate Unit	Kennett Consolidated School District	Phoenixville Area School District	Tredyffrin/Easttown School District	West Chester Area School District
Coatesville Area School District	Octorara Area School District	Pope John Paul II Regional Catholic Elementary School	Twin Valley School District	
Hospitals and Healthcare				
Bryn Mawr Rehabilitation Hospital	Coatesville FD EMS	Jennersville Hospital	Paoli Memorial Hospital	St John Vianney Center
Chester County Health Department	Coatesville VA Medical Center	Jennersville Regional Hospital	Phoenixville Hospital	Tower Health, Brandywine Hospital
Chester County Hospital	Emergency Educators (Phoenixville Hospital)	Main Line Health System	Pottstown Medical Transport	Universal Health Services
Children's Behavioral Health Services, Devereux	Hospital and Health system Association of Pennsylvania (HAP)	Paoli Hospital	Riddle Hospital	
Fire Departments				
Arcelor-Mittal Steel Fire Company (Station 75)	East Brandywine Fire Company	Keystone Valley Department	Paoli Fire Co	Upper Uwchlan Township
Avondale Fire Company	East Whiteland Fire Company	Kimberton Fire Company	Parkesburg Borough Fire Department	Valley Forge Fire Company
Berwyn Fire Co	Fame Fire Co	Liberty Stream Fire Company	Phoenixville Fire Department	Wagontown Fire Co
Birmingham/Pennsbury Township	First West Chester Fire Co	Lionville Fire Company	Po-Mar-Lin Fire Company	West Chester Fire Department First West Chester
Caln Township/Parkesburg Borough/West Sadsbury Township	Friendship Fire Company Dive Rescue	Longwood Fire Company	Ridge Fire Company	West Chester Fire Department Goodwill
Chester County Fire Police Association	Glenmoore Fire Company	Ludwigs Corner Fire Company	Sadsburyville Fire Company	West End Fire Company
Christiana Fire Co (LancCo)	Goodwill Fire Co. West Chester	Malvern Fire Company	Sikorsky Aircraft Fire Department	West Grove Fire Company
Coatesville Fire Department	Goshen Fire Company	Minquas Fire Company	Thorndale Fire Company	Westwood Fire Company
Cochranville Fire Co	Honey Brook Fire Company	Modena Fire Company	Twin Valley Fire Department	
DES - 911 Center Staff	Kennett Fire Company	Norco Fire Co	Union Fire Company No.1	



Police Departments				
Downingtown Borough Police Department (PD)	East Pikeland Township Police Department	Tredyffrin Township Police Department	Valley Township Police Department	West Chester University Police Dept.
East Coventry Township Police Department	Owen J Roberts School Police	Uwchlan Township Police Department	West Brandywine Township Police	Willistown Township Police
East Marlborough Township PD				
Emergency Medical Services (EMS) Agencies				
AFC Urgent Care	Director of EMS/Operations Chief	JeffSTAT (Jefferson Hospital)	Nemours Kids Transport	Uwchlan Ambulance Corps (Station 87)
Arcelor-Mittal Steel Fire Company (Station 75)	East Brandywine Fire Co	Kennett Fire Company	Paoli Fire Company	Uwchlan EMS
Avondale Fire Company/Kennett Fire Co.	East Whiteland Fire Company (Station 5)	Keystone Quality Transport	PennSTAR Flight	Washington Hose Company No.1
Berwyn Fire Company (Station 2)	Elverson-Honey Brook Area EMS	Keystone Valley Fire Co EMS	Po-Mar-Lin Fire Company (Station 36)	West Brandywine
Brandywine Hospital	Fina and Associates, L.L.C.	Lifestar Ambulance	Radnor Fire Company Ambulance (Delco 15)	West Chester University
Caln Township/Parkesburg Borough/West Sadsbury Township	Friendship Ambulance-Royerford 325	Longwood Fire Company (station 25)	Southern Chester County EMS (Medic 94)	West End Fire Co #3 EMS
Christiana Care LifeNet	Good Fellowship Ambulance Club (Station 55)	Ludwigs Corner Fire Company (Station 25)	TeenAID, Inc	West Grove Fire Co
DES	Goodwill Ambulance Co	Malvern Fire Company (Station 4)	Thorndale Fire Co. QRS	Westwood Fire Company (Station 44) EMS
PSTC	Goshen Fire Company EMS	Minquas Fire Co, EMS	Twin Valley Fire Department (Station 69)	
DES-911 Center	Iron Spring Farm, Inc	Modena Fire Company (Station 37)	Union Fire Company No. 1/CCDES	
Retirement, Personal Care, and Nursing Homes				
Arbor Terrace at Willistown	Chester County Department of MHIDD	Freedom Village Brandywine	Longwood Fire Company / Kendal-Crosslands	St Martha Center / Villa
Ashbridge Manor Senior Living	Chester County Department of Veterans Affairs	Friends Home - Linden Hall SK	M5	St Martha Manor
Aventura at Pembroke	Chester County Health Department	Gaudenzia, Inc	Madanat Personal Care	St. John Vianney
Barclay Friends	Chester County Pocopson Home	Glencrest Manor Personal Care Home	Malvern Health	Steward Place
Bellingham Park Lane	Chester County Prison	Green Meadows Nursing and Rehabilitation Center	Manatawny Manor, INC	Sunrise Senior Living of Exton
Bellingham Retirement Community	Chester County Youth Center	Harlee Manor Inc	Merakey Chester County/Merakey Delaware County	Sunrise Senior Living of Paoli
Bowling Green Inn Brandywine	Chester Valley Rehabilitation and Nursing Center	Harrison House - Senior Living Chester County	NHS Chester County	Tel Hai - Lakeview at Tel Hai Personal Care
Brandywine Assisted Living at Longwood	Child & Family Focus	Harrison Senior Living	Oxford Health Center at Ware Presbyterian Village	Tel Hai - Meadows Health Care Center



Brandywine Hall	Circle of Support	Heatherwood Retirement Community	Parzival	Tel Hai Retirement Community
Brightview Senior Living-Devon	Colonial Woods Personal Care Home	Hickory House Nursing Home	Petra Community Housing	The Community at Phoenixville
Brinton Manor	Creative Health Services	Highgate at Paoli Pointe	Phoenix Center for rehab and Nursing	The Devon Senior Living
Brookdale Senior Living	Crosslands	Holisticare Hospice	Pocopson Home	The Gardens at Freedom Village (Brookdale)
Bureau of Laboratories	Dalesio and Associates, Inc	Homecare Rehab/Simpson Meadows	PowerBack Rehabilitation Exton	The Hickman Friends Senior Community
Buttonwood Farm-Spirit of Gheel, Gheel House	Davita Dialysis - Corporate	Horizon House	Preston Residence at Jenner's Pond	The Inn at Freedom Village (Brookdale)
CADES	Daylesford Crossing	Immaculate Mary Center for Rehabilitation and Health Care	Professional Nursing Services, Inc.	The Phoenix Center for Rehabilitation and Nursing Center
Camilla Hall Covent and Health Care Center	Developmental Enterprises	Jenner's Pond Retirement Community	Resources for Human Development - Community Choices	There's No Place Like Home (TNPLH) Home Care
CareLink Community Support Services	Devereux Advanced Behavioral Health	Jenner's Pond, Preston	Resources for Human Development - Supported Adult Living Team	Twin Pines Health Care Center
Chester County Department of Aging	Devereux CIDDS	Kadima Rehabilitation & Nursing at Pottstown	Royer-Greaves School for the Blind	Veterans Administration Medical Center
Chester County Department of Children, Youth & Families	Devereux PA Adult Services- Villanova	Kelsch Associates	Simpson Meadows	Ware Presbyterian - Oxford Health Center
Chester County Department of Community Development	Devereux PA Adult Services Center (Hankin Health Center)	Kendal - Crosslands Communities	Southeastern Pennsylvania (SEPA) Veterans Center	Wellington Court of Hershey's Mill
Chester County Department of Drug & Alcohol Services	Exton Senior Living	Kendal at Longwood	Spectra Support Services	Westtown Sunrise Senior Living
Chester County Department of Human Services	Fellowship Health Resources, Inc.	Kindred House	Spring Mill Senior Living	Woodbridge Place
Chester County Department of Managed Behavioral Healthcare	Freedom Village (Brookdale)	Linden Hall	Spirit of Gheel (Gheel House & Buttonwood Farm)	
Neighboring Jurisdictions				
Lancaster County EMA	Montgomery County DPS	Philadelphia OEM	Bucks County EMA	Delaware County EMA
Chambers of Commerce/ Economic Development				
Chester County Chamber of Business and Industry	Exton Region Chamber of Commerce	Main Line Chamber of Commerce	Phoenixville Regional Chamber of Commerce	Tri County Area Chamber of Commerce
Chester County Economic Development Council	Greater West Chester Chamber of Commerce	Oxford Area Chamber of Commerce	Southern Chester County Chamber of Commerce	Western Chester County Chamber of Commerce
Downingtown-Thorndale Regional Chamber of Commerce				



Community Organizations				
Agency and Community Partnerships	Habitat for Humanity of Chester County	Maternal and Child Health Consortium	Phoenixville Area Community Services (PACS)	United Way of Chester County
Brandywine Health Foundation	La Comunidad Hispana	Oxford Neighborhood Services Center (ONS)	Phoenixville Community Health Foundation	West Chester Area Day Care Center
Chester County Food Cupboard				
Environmental Advocates and Watershed Organizations				
Ag Land Preservation Board	Delaware Riverkeeper	Master Water Stewards/Valley Creek Restoration	Pennsylvania Department of Environmental Protection	The Wallace Trust
Brandywine Conservancy	Elk Creeks Watershed Association	Natural Lands	Schuylkill River Greenway Association	Valley Creek Restoration Partnership
Brandywine Red Clay Alliance	French and Pickering Creeks Conservation Trust	Octoraro Watershed Association	Stroud Water Research Center	Valley Forge Trout Unlimited
Chester County Conservation District	Green Valleys Watershed Association	Open Land Conservancy of Chester County	The Conservation Fund	West Chester Fish, Game & Wildlife Association
Chester-Ridley-Crum Watersheds Association	Guardians of the Brandywine	Pennsbury Land Trust	The Land Conservancy for Southern Chester County	Willistown Conservation Trust
Darby-Cobbs Watershed Partnership	London Britain Twp Land Trust	Pennsylvania Department of Agriculture- Bureau of Farmland Preservation	The Nature Conservancy	White Clay Watershed Association
Darby Creek Valley Association				
Water Suppliers				
American Water	Aqua	Chester Water Authority	Downingtown Municipal Water Authority	
Public Transportation				
CHESCOBUS	Krapf Transportation	Region 3 Amtrak		
Other Stakeholders				
FEMA	Oxford Area Sewer Authority	PEMA	PennDOT District Office	Vanguard
Longwood Gardens	Parzival	PennDOT	Transportation Management Association of Chester County (TMACC)	West Pharmaceutical Services

For a complete list of individual invitees, participants, attendance at meetings, completion of worksheets, or submission of comments, please refer to Appendices C through E.

The Planning Team acknowledged that important steps in developing a comprehensive HMP were identifying hazards that specifically affect Chester County, and assessing their likelihood of occurrence, along with potential damage to the people, property, and environment of the county. The Planning Team chose to focus on an all-hazards approach rather than narrow the focus to natural disasters only.



As the contract consultant, Tetra Tech guided the Steering Committee and Planning Team through the HMP update planning process. More specifically, Tetra Tech was tasked with:

- Assisting with the organization of a Steering Committee and Planning Team
- Assisting with the development and implementation of a public and stakeholder outreach program
- Collecting data
- Facilitating and recording attendance at meetings
- Assisting with the review, update, and ranking of the hazards of concern, hazard profiling, and risk assessment
- Assisting with the review and update of mitigation planning goals and objectives
- Assisting with the review of progress of past mitigation strategy
- Assisting with the screening of mitigation actions and the identification of appropriate actions
- Assisting with the prioritization of mitigation actions
- Authoring of the draft and final HMP documents

3.3 MEETINGS AND DOCUMENTATION

Tetra Tech assisted the county in drafting planning documents, preparing meeting materials, and facilitating meetings. The Steering Committee reviewed documentation, provided validation, and acted as an advocate for the HMP update.

Table 3-1 lists dates and descriptions of meetings held by the Chester County Steering Committee and Planning Team as part of the process of updating the Chester County HMP.

Table 3-1. Public and Planning Meetings

Date	Description of Meeting
February 6, 2020	Kickoff meeting with Department of Emergency Management
February 20, 2020	Kickoff meeting with Steering Team member, including a 5-year plan review and plan update process, evaluation of identified hazards, capability assessment, and mitigation strategy review. The Steering Team members identified problem areas and issues throughout the county for each hazard.
March 13, 2020	Initial Planning Team Meeting to update the risk assessment, update the capabilities assessment, update the mitigation strategy, update other sections of the HMP
October 23, 2020	Direct outreach discussions with municipalities to garner as much participation in the planning process as possible
November 9, 2020	Risk Assessment Review Meetings to present the risk assessments of hazards and hand out the mitigation actions, municipality risk factor analysis worksheets for the municipalities to complete
December 9, 2020	Mitigation Strategy Workshop to review mitigation goals, objectives, actions, and current plan status with the Planning Team.
December 15, 2020	4 th Quarterly Training of 2020 that discussed the HMP
April 7, 2021	Plan Draft Review Meeting to collect comments on the completed draft
July 2021	HMP adoption by County Commissioners

The Steering Committee followed up each meeting with meeting notes that documented all agenda topics, decisions, and action items identified. The meeting minutes were posted to the project website. Documentation from all meetings is located in Appendix C.

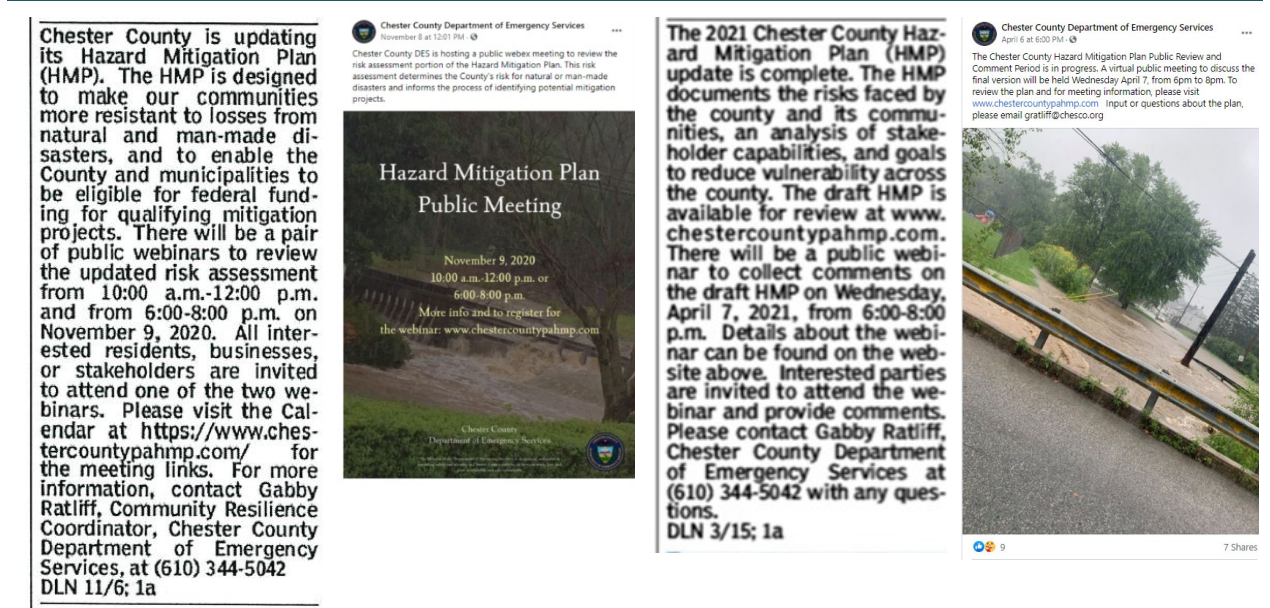
Chester County residents were informed of the planning process through various sources, including newspaper-announced public notices and announcements on the Chester County HMP project website (<https://www.chestercountypahmp.com/>).





The Risk Assessment Review Meeting and the Draft Review Meeting were advertised as public meetings (see Figure 3-1). Any subsequent supporting documentation provided by county residents will be included in Appendix E (Public and Stakeholder Participation).

Figure 3-1. Public Meeting Public Notices



3.4 PUBLIC AND STAKEHOLDER PARTICIPATION

To maximize the effectiveness of the HMP, the Steering Team fostered continual public and stakeholder engagement. Input was encouraged and collected through a variety of methods. Five worksheets/surveys—the Hazard/Risk Identification Survey, Risk Factor Analysis Survey, Capabilities Assessment Survey, NFIP Survey, and Mitigation Strategy 5-Year Plan Review Worksheet (Mitigation Review Worksheet)—were given to representatives from each municipality in Chester County. 73 jurisdictions (the county and 72 municipalities) provided information so that their input could be reviewed and incorporated into the updated HMP.

The following entities with vested interest in development of the updated HMP were given the opportunity to participate in the planning process by attending a Planning Team or public meeting or by offering comments on the project website: local, state, and federal agencies; neighboring jurisdictions (Montgomery County, Philadelphia, Bucks County, Lancaster County, and Delaware County); community leaders; educators; healthcare facilities; and other relevant private and nonprofit groups. Invitations to participate in meetings were sent to those stakeholders. Appendix E includes a copy of the Planning Team meeting invitation list and sample copies of invitation letters sent. Meeting invitations were also sent to all municipalities, including elected officials and emergency management coordinators. Additionally, direct outreach by phone or one-on-one meetings was conducted with municipalities who were unable to attend other meetings or who had questions about worksheets, participation requirements, the planning process, or mitigation project selection. 58 municipalities in Chester County had representatives attending at least one meeting; the other 15 participating municipalities were contacted individually.

Through public notices published in the local newspapers, the groups listed in Section 3.2 and the general public were invited to visit the project website, review the draft County HMP update, and send comments to DES. Copies of the public notices and other forms of public and stakeholder outreach are presented in Appendix E.



Throughout the course of the entire planning process, the following stakeholder organizations participated:

- AFC Urgent Care
- Agency and Community Partnerships
- Aqua Water
- Avon Grove School District
- Avondale Fire Company
- Bishop Shanahan High School
- Brandywine Conservancy and Museum of Art
- Brandywine Hospital - Tower Health
- Brandywine River Valley Home Health
- Brookdale
- Camilla Hall Nursing Home
- CHESCOBUS
- Chester County Fire Police Association
- Chester County Hospital
- Chester County Planning Commission
- Chester County Water Resources Authority
- Children's Behavioral Health Services, Devereux
- Downingtown Area School District
- Downingtown Police Department
- Downingtown Municipal Water Authority
- East Coventry Township Police Department
- East Pikeland Township Police Department
- Glen Moore Fire Company
- Goshen Fire Company
- Harrison Senior Living
- Holisticare Hospice
- Hickory House
- Krapf Transportation
- Kennett Fire Company
- Longwood Fire Company
- Longwood Gardens
- Minquas Fire Company
- Octorara Watershed Association
- Oxford Area School District
- Oxford Area Sewer Authority
- Owen J Roberts School Police
- Park Lane at Bellingham Skilled Nursing Facility
- Parzival
- Pennsylvania Department of Environmental Protection
- Phoenixville School District
- Pocopson Home
- Pope John Paul II Regional Catholic Elementary School
- Region 3 Amtrak
- Renaissance Charter Academy
- Saint Patrick School
- Tel Hai Personal Care
- There's No Place Like Home (TNPLH) Home Care
- Tredyffrin/Easttown School District
- Tredyffrin Township Police Department
- Trout Unlimited Valley Forge
- United Way of Chester County
- Uwchlan Township Police Department
- Vanguard
- Villa Maria Academy High School
- West Brandywine Township Police
- West Chester Area School District
- West Chester Borough Police Department
- West End Fire Company
- West Pharmaceutical Services
- Willistown Township Police

Table 3-2 in Section 3.5 of this HMP shows the overall municipal participation in the planning process.

3.5 MULTI-JURISDICTIONAL PLANNING

Chester County took a multi-jurisdictional approach to preparing the HMP so that the HMP would apply to the county and all participating municipalities. The county was able to provide resources (e.g., data, geographic information system [GIS], etc.) to which the municipalities might not have had access. However, Chester County depended on municipal buy-in because the municipalities have the legal authority to enforce compliance with land use planning and development directives. Chester County undertook an intensive effort to involve all 73 municipalities in the update process.

Each municipality was given the opportunity to participate in this process. Municipal officials and representatives were invited to attend Planning Team and public meetings; were provided worksheets to update the hazards of concern, capabilities, and mitigation strategy; and were asked to review and prioritize the mitigation actions. Municipal participation culminated in the formal adoption of the HMP; copies of municipal adoption resolutions are in Appendix F. Table 3-2 indicates the ways each municipality participated in the



planning process. In some cases, a municipality was unable to attend a Planning Team meeting; therefore, an individual follow-up meeting with each municipality was held by Chester County Steering Committee representatives to cover the meeting material and provide municipal support on the topics presented.



Table 3-2. Participation Matrix

Jurisdiction	Meetings					Indiv. Contact	Worksheets					2021 Plan Adoption Date	
	Planning Team Kickoff Meeting (3/13/20)	Risk Assessment Meeting (11/9/20)	Mitigation Strategy Workshop (12/9/20)	Quarterly EMC Training (12/15/20)	HMP Draft Review Meeting (4/7/21)		Hazard Evaluation Survey	Capability Assessment Survey	Mitigation Strategy Survey	Municipal Mitigation Strategy Survey	NFIP Survey		RF*
Chester County	X	X	X	X	X								TBD
Atglen Borough		X	X			X							TBD
Avondale Borough			X										TBD
Birmingham Township						X							TBD
Caln Township	X		X				X	X	X	X	X		TBD
Charlestown Township	X	X	X	X									TBD
Coatesville City			X			X				X			TBD
Downingtown Borough		X				X							TBD
East Bradford Township			X		X		X	X	X	X	X		TBD
East Brandywine Township	X							X	X	X	X		TBD
East Caln Township			X										TBD
East Coventry Township	X	X		X		X							TBD
East Fallowfield Township				X		X							TBD
East Goshen Township							X	X	X	X	X		TBD
East Marlborough Township							X	X	X	X	X		TBD
East Nantmeal Township						X							TBD
East Nottingham Township			X	X	X								TBD
East Pikeland Township	X			X			X	X	X	X	X		TBD
East Vincent Township						X							TBD
East Whiteland Township	X	X	X	X	X	X	X	X	X	X	X	X	TBD
Easttown Township		X	X	X	X					X			TBD
Elk Township		X		X	X								TBD
Elverson Borough	X						X						TBD
Franklin Township			X			X							TBD
Highland Township						X							TBD
Honey Brook Borough	X						X	X			X		TBD
Honey Brook Township							X	X			X		TBD
Kennett Square Borough	X	X	X				X			X	X		TBD
Kennett Township	X	X	X		X		X	X	X	X	X		TBD





Jurisdiction	Meetings					Indiv. Contact	Worksheets					2021 Plan Adoption Date	
	Planning Team Kickoff Meeting (3/13/20)	Risk Assessment Meeting (11/9/20)	Mitigation Strategy Workshop (12/9/20)	Quarterly EMC Training (12/15/20)	HMP Draft Review Meeting (4/7/21)		Hazard Evaluation Survey	Capability Assessment Survey	Mitigation Strategy Survey	Municipal Mitigation Strategy Survey	NFIP Survey		RF*
London Britain Township	X	X	X				X	X	X	X	X		TBD
London Grove Township	X		X	X	X		X	X	X	X	X	X	TBD
Londonderry Township			X			X	X	X	X	X	X		TBD
Lower Oxford Township	X						X	X	X	X	X		TBD
Malvern Borough			X	X						X			TBD
Modena Borough						X							TBD
New Garden Township		X	X				X	X		X	X		TBD
New London Township	X	X		X	X								TBD
Newlin Township						X							TBD
North Coventry Township	X		X				X	X	X		X		TBD
Oxford Borough		X	X	X	X		X	X		X			TBD
Parkesburg Borough	X		X				X	X	X	X	X		TBD
Penn Township						X							TBD
Pennsbury Township	X	X					X	X	X	X	X		TBD
Phoenixville Borough				X		X							TBD
Pocopson Township	X		X	X	X	X							TBD
Sadsbury Township						X							TBD
Schuylkill Township	X	X			X	X							TBD
South Coatesville Borough	X		X										TBD
South Coventry Township				X									TBD
Spring City Borough	X												TBD
Thornbury Township	X	X	X		X		X	X	X	X	X	X	TBD
Tredyffrin Township	X	X	X		X	X							TBD
Upper Oxford Township			X										TBD
Upper Uwchlan Township		X		X			X	X	X	X	X		TBD
Uwchlan Township			X	X		X							TBD
Valley Township					X	X							TBD
Wallace Township				X									TBD
Warwick Township						X							TBD
West Bradford Township	X		X	X	X	X							TBD
West Brandywine Township		X	X	X	X	X	X						TBD
West Caln Township			X	X		X	X	X	X		X		TBD



Jurisdiction	Meetings					Indiv. Contact	Worksheets					2021 Plan Adoption Date	
	Planning Team Kickoff Meeting (3/13/20)	Risk Assessment Meeting (11/9/20)	Mitigation Strategy Workshop (12/9/20)	Quarterly EMC Training (12/15/20)	HMP Draft Review Meeting (4/7/21)		Hazard Evaluation Survey	Capability Assessment Survey	Mitigation Strategy Survey	Municipal Mitigation Strategy Survey	NFIP Survey		RF*
West Chester Borough	X						X	X	X	X	X		TBD
West Fallowfield Township						X							TBD
West Goshen Township		X		X			X	X	X	X	X		TBD
West Grove Borough				X		X					X		TBD
West Marlborough Township						X							TBD
West Nantmeal Township	X	X					X						TBD
West Nottingham Township		X	X		X		X	X	X	X	X		TBD
West Pikeland Township	X			X									TBD
West Sadsbury Township			X										TBD
West Vincent Township						X							TBD
West Whiteland Township		X					X	X		X	X		TBD
Westtown Township	X		X	X	X						X		TBD
Willistown Township	X	X	X	X	X		X		X				TBD

Notes:
 Indiv. = Individual
 RF = Municipal Risk Factor worksheet
 TBD = To be determined after plan is granted “approvable pending adoption” status by FEMA Region III.



SECTION 4 RISK ASSESSMENT

4.1 UPDATE PROCESS SUMMARY

In accordance with the Federal Emergency Management Agency (FEMA) Local Mitigation Planning Handbook, risk is the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets. Chester County's risk assessment is organized into the following sections:

- Section 4.2 outlines the hazard identification process for both natural and human-caused hazards of concern for further profiling and evaluation.
- Section 4.3 profiles the hazards of concern (location and extent, range of magnitude, past occurrence, and future occurrence) and assesses vulnerability.
- Section 4.4 summarizes the risk assessment methodology, ranking results, potential losses, and future development and vulnerability.

The Steering Committee and Planning Team evaluated the 2015 Hazard Mitigation Plan (HMP) hazards of concern by examining the historic events that have taken place in the county since the last plan update and by also reviewing the Commonwealth's 2018 HMP. In addition, the Steering Committee and Planning Team completed the risk assessment worksheet (Evaluation of Identified Hazards and Risk Worksheet). The worksheet listed hazards profiled in the 2015 HMP and requested that participants identify whether the frequency of occurrence, magnitude of impact, and/or geographic extent of each hazard increased, decreased, or did not change since the preparation of the 2015 HMP. The worksheet also provided the opportunity to assess hazards not profiled in the HMP to determine if those hazards should be included as part of the update. Responses from the worksheets were reviewed by the Steering Committee to identify a list of hazards to profile in the 2021 HMP. Civil Disturbance, Armed Attacks, and Thunderstorms were deleted as their own profiles. Thunderstorms are addressed in the Tornadoes and Windstorms hazard profile (Section 4.3.16) since their effects in eastern Pennsylvania are generally limited to windstorms. Armed Attacks are addressed in Terrorism (Section 4.3.15). Civil Disturbance was deleted because they did not have significant effects in the county. Each hazard profile also includes an additional subsection that discusses the effect of climate change on vulnerability. Appendix H includes copies of the completed worksheets.



4.2 HAZARD IDENTIFICATION

This section summarizes previous disaster declarations and identifies the hazards of concern for Chester County.

4.2.1 Disaster Declarations

In reviewing and updating Chester County’s hazards of concern, the Steering Committee and Planning Team reviewed additional information and historical records from a wide range of sources. This section discusses the Presidential Disaster and Emergency Declarations, Gubernatorial Disaster Declarations or Proclamations, and Small Business Administration Disaster Declarations on record that have affected Chester County.

Presidential Disaster and Emergency Declarations are issued when it has been determined that state and local governments need assistance in responding to a disaster event. Since 1955, declarations have been issued for various hazard events, including hurricanes or tropical storms, severe winter storms, and flooding. A unique Presidential Emergency Declaration, Emergency Declaration 3235, was issued in September 2005. Through this declaration, President George W. Bush declared a state of emergency for the Commonwealth of Pennsylvania and ordered federal aid to supplement Commonwealth and local response efforts to help people evacuate from their homes due to Hurricane Katrina, though the Commonwealth was not directly impacted by Hurricane Katrina. A summary of declarations affecting the County is provided in the tables below.

Table 4.2-1 lists Presidential Disaster and Emergency Declarations issued from 1972 through March 2020 that have affected Chester County.

Table 4.2-1. Presidential Disaster and Emergency Declarations Affecting Chester County

Declaration Number	Date	Event
DR-4506	March 2020	Coronavirus (COVID-19) Pandemic
EM-3441	March 2020	COVID-19
DR-4267	March 2016	Severe Winter Storm and Snowstorm
EM-3367	February 2014	Severe Winter Storm
EM-3356	October 2012	Hurricane Sandy
DR-4030	September 2011	Tropical Storm Lee
EM-3340	September 2011	Remnants of Tropical Storm Lee
DR-4025	September 2011	Hurricane Irene
EM-3339	August 2011	Hurricane Irene
DR-1898	April 2010	Severe Winter Storms and Snowstorms
DR-1649	June 2006	Severe Storms, Flooding, and Mudslides
EM-3235	September 2005	Hurricane Katrina Evacuation
DR-1557	September 2004	Tropical Depression Ivan
DR-1497	September 2003	Tropical Storms Henri and Isabel, and Related Severe Storms and Flooding
EM-3180	March 2003	Snowstorm
DR-1294	September 1999	Hurricane Floyd
DR-1093	January 1996	Flooding
DR-1085	January 1996	Blizzard



Declaration Number	Date	Event
DR-1015	March 1994	Winter Storm, Severe Storm
EM-3105	March 1993	Severe Snowfall and Winter Storm
DR-400	July 1973	Severe Storms, Flooding
DR-340	June 1972	Tropical Storm Agnes

In addition to these Presidentially-declared events, 33 events warranted Gubernatorial Disaster Declarations or Proclamations that included Chester County, as shown in Table 4.2-2 (Pennsylvania Emergency Management Agency [PEMA] 2020).

Table 4.2-2. Gubernatorial Disaster Declarations or Proclamations Affecting Chester County

Date	Event
March 2020	Emergency Disaster Declaration – Coronavirus (COVID-19)
January 2019	Proclamation of Disaster Emergency – Severe Winter Event
August 2018	Proclamation of Disaster Emergency – Severe Weather Event
June 2018	Proclamation of Disaster Emergency – Severe Weather Event
January 2018	Proclamation of Disaster Emergency – Opioid Crisis
March 2017	Proclamation of Emergency – Severe Winter Storm
January 2016	Proclamation of Disaster Emergency – Severe Winter Weather
August 2015	Proclamation of Disaster Emergency – Severe Storms
January 2015	Proclamation of Disaster Emergency – Severe Winter Weather
February 2014	Proclamation of Emergency – Severe Winter Weather
January 2014	Proclamation of Emergency – Regulations – Severe Cold
June 2013	Proclamation of Emergency – High Winds, Thunderstorms, Heavy Rain, Tornado, Flooding
October 2012	Proclamation of Emergency – Hurricane Sandy
April 2012	Proclamation of Emergency – Spring Winter Storms
August 2011	Proclamation of Emergency - Severe Storms and Flooding (Lee/Irene)
January 2011	Proclamation of Emergency – Severe Winter Storm
February 2010	Proclamation of Emergency – Severe Winter Storm
April 2007	Proclamation of Emergency – Severe Winter Storm
February 2007	Proclamation of Emergency – Severe Winter Storm
February 2007	Proclamation of Emergency – Regulations
September 2006	Proclamation of Emergency – Tropical Depression Ernesto
September 2005	Proclamation of Emergency – Hurricane Katrina
February 2002	Drought and Water Shortage
July 1999	Drought
April 1997	Snowstorm
September 1995	Drought
January 1988	Oil Spill
November 1980	Drought Emergency
February 1978	Blizzard



Date	Event
January 1978	Heavy Snow
February 1974	Truckers' Strike
February 1972	Heavy Snow
January 1966	Heavy Snow

Chester County has also received Small Business Administration Disaster Assistance for a number of disaster events. A Small Business Administration Disaster Declaration qualifies communities for affordable, timely, and accessible financial assistance. Table 4.2-3 lists Small Business Administration Disaster Declarations issued for Chester County from 1989 through July 2019 (PEMA 2020), in addition those declarations for which Chester County was included as an adjacent county.

Table 4.2-3. Small Business Administration Disaster Declarations Affecting Chester County

Date	Event
July 2019	Flash Flooding
February 2014	Economic Injury
April 2012	Agricultural Disaster
August 2009	Flooding
January 2009	Coatesville Arson Fires
November 2007	Fires
May 2001	Fires
August 1992	Fire
July 1989	Flooding
February 1989	Fire

4.2.2 Summary of Hazards

As part of the plan update process, the Steering Committee and Planning Team reviewed the hazards of concern detailed in the 2015 version of the plan as well as those identified in the State Hazard Mitigation Plan (HMP). They also considered the history of hazard events occurring in Chester County as well as events occurring after the completion of the 2015 version of the plan. This review of historical events included an evaluation of all emergency and disaster declarations in the Commonwealth, with a focus on those in which Chester County was designated for federal assistance.

Further, all jurisdictions participating in the plan update process were provided a *Hazard Identification/Evaluation of Risk* worksheet to help identify the hazards—natural and non-natural—that each community believed posed significant risk to Chester County, including any that may not have been considered in either the 2015 version of the plan or the State HMP. Completed worksheets submitted by the municipalities are included in Appendix D. Following the review of the 2015 hazards list and completion of the *Hazard Identification/Evaluation of Risk* worksheet, additional hazards were considered in need of a risk assessment. The Steering Committee and Planning Team decided to remove Civil Disturbance hazard that was addressed in the 2015 version of the HMP. Thunderstorms were incorporated into the Tornado and Windstorm hazard profile. Armed Attacks, Conventional/Improvised Bombs, and Cyber Terrorism were incorporated into the Terrorism profile.



Based on all available information and input from the municipalities, the Steering Committee and Planning Team selected the following natural and non-natural hazards for consideration in this plan:

Natural Hazards

- Drought/Water Supply Deficiencies
- Earthquake
- Extreme Temperatures
- Flood, Flash Flood, Ice Jams
- Hurricanes and Tropical Storms
- Invasive Species
- Pandemic
- Radon Exposure
- Tornado and Windstorm
- Winter Storm

Non-Natural Hazards

- Dam Failure
- Environmental Hazards
- Nuclear Incident
- Opioid Epidemic
- Pipeline Incidents
- Structural Fires
- Terrorism
- Transportation Accidents
- Utility Failure

These hazards have been profiled individually in Section 4.3 of this plan.



4.3.1 Dam Failure

This section provides a profile and vulnerability assessment of the dam failure hazard in Chester County. A dam is an artificial barrier allowing storage of water, wastewater, or liquid-borne materials for many reasons (flood control, human water supply, irrigation, livestock water supply, energy generation, containment of mine tailings, recreation, or pollution control). Many dams fulfill a combination of these stated functions (Association of State Dam Safety Officials 2013). Dams are an important resource in the United States.

Man-made dams can be classified according to type of construction material used, methods applied in construction, slope or cross-section of the dam, how a dam resists forces of water pressure behind it, means used to control seepage, and, occasionally, purpose of the dam. Materials used for construction of dams include earth, rock, tailings from mining or milling, concrete, masonry, steel, timber, miscellaneous materials (plastic or rubber), and any combination of these materials (Association of State Dam Safety Officials 2013).

More than a third of the country’s dams are 50 or more years old. Approximately 14,000 of those dams pose a significant hazard to life and property if failure occurs. About 2,000 unsafe dams are dispersed throughout the United States in almost every state.

Dams typically fail when spillway capacity is inadequate and excess flow overtops the dam, or when internal erosion (piping) through the dam or foundation occurs. Complete failure occurs if internal erosion or overtopping results in a complete structural breach, releasing a high-velocity wall of debris-filled water that rushes downstream, damaging or destroying anything in its path (Federal Emergency Management Agency [FEMA] 2015b).

Dam failures can result from the following:

- Overtopping caused by floods that exceed capacity of the dam
- Deliberate acts of sabotage
- Structural failure of materials used in dam construction
- Movement or failure of the foundation supporting the dam
- Settling and cracking of concrete or embankment dams
- Piping and internal erosion of soil in embankment dams
- Inadequate maintenance and upkeep (FEMA 2015b)

Regulatory Oversight of Dams

Potential for catastrophic flooding caused by dam failures led to enactment of the National Dam Safety Act (Public Law 92-367), which has protected Americans from dam failures for 30 years. The National Dam Safety Program (NDSP) is a partnership among states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA’s leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and purchases of needed equipment. FEMA has also expanded existing and initiated new training programs. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most dams in the United States (FEMA 2013).

Pennsylvania Department of Environmental Protection

The Pennsylvania Department of Environmental Protection (PADEP) holds responsibility for dam safety. Hazard Potential Category 1 dams are those “where its failure could result in significant loss of life, excessive economic losses, and significant public inconvenience.” Hazard Potential Category 2 dams are those “where its failure could result in the loss of a few lives, appreciable property damage, and short-duration public inconvenience” (PADEP 2009a). Owners of dams classified as Hazard Categories 1 or 2 (“high-hazard” dams) are required to create an Emergency Action Plan (EAP) that describes the dam, the inundation area if the dam were to catastrophically fail, and procedures for responding to the dam failure (such as notification to the



vulnerable population). Chester County receives copies of EAPs and inundation maps for high-hazard dams whose failure could impact local residents.

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. USACE has inventoried dams and has surveyed each state’s and federal agency’s capabilities, practices, and regulations regarding design, construction, operation, and maintenance of the dams. USACE has also developed guidelines for inspection and evaluation of dam safety (USACE 2017b). The USACE National Inventory of Dams (NID) provides the most recent dates of inspection of the following Chester County dams:

Table 4.3.1-1. Chester County Dams and Inspection Dates

Dam Name	Most Recent Inspection Date	Dam Name	Most Recent Inspection Date
Barneston (PA 432)	April 5, 2017	Pine Grove	July 15, 2016
Beaver Creek (PA-433)	April 7, 2017	Pond #3	None
Brook Crossing Detention	October 25, 2017	Pond NO 1	May 15, 2007
Chester CO. Prison Storage Lagoon	August 8, 2016	Pond NO 2	July 10, 2014
Cold Springs Park	July 16, 2014	Pond NO 3	July 15, 2014
Crossing NO 3	August 8, 2016	Pond View Farm	October 25, 2017
Crossing NO 5	August 8, 2016	R G Struble Lake (PA-431)	April 7, 2017
Devon Detention	October 26,2017	Rock Run	April 27, 2017
Green Valley Farms	October 26,2017	Savery Mill	November 15, 2012
Hankin	July 16, 2013	Somerset Lakes Basin NO 2	June 2, 2016
Herr Foods Storage Lagoon	October 19,2017	Thomas Meeting Detention Basin	November 4, 2016
Hershey Mill	May 19, 2017	Timber	February 20, 2013
Hibernia (PA-436F)	April 7, 2017	Township Line (Airport Road)	October 3, 2017
Lake Somerset	October 31,2017	Walker Farm Lagoon	December 8, 2017
Leopard Lake	October 26,2017	Washburn Lake	December 8, 2017
Lincoln Avenue Detention Basin	November 2, 2017	Wastewater Treatment	December 5, 2014
Linpro Detention Basin	September 2, 2017	Welkinweir	November 16, 2017
Malvern Preparatory Lower	March 28, 2012	West Whiteland Business Park	September 2, 2016
Marsh Creek Reservoir (PA-437)	February 26, 2018	Westtown	December 22, 2014
Milltown	September 11, 2017	Wharton Boulevard Stormwater	October 11, 2017
Osborne Lagoon	December 3, 2014	Whiteford Ridge Detention Basin	November 4, 2016
Pickering Creek	October 3, 2017		

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. FERC staff inspect hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project
- Safety concerns related to natural disasters
- Issues concerning compliance with terms and conditions of a license (FERC 2017)



Every 5 years, an independent consulting engineer, approved by FERC, must inspect and evaluate projects with dams higher than 32.8 feet (10 meters) or with total storage capacity of more than 2,000 acre-feet (FERC 2017).

FERC monitors and evaluates seismic research in geographic areas where seismic activity is a concern. This information is applied to investigate and analyze structures of hydroelectric projects within these areas. FERC staff also evaluates effects of potential and actual large floods on safety of dams. FERC staff visit dams and licensed projects during and after floods, assess extents of damage, and direct any studies or remedial measures the licensee must undertake. FERC’s *Engineering Guidelines for the Evaluation of Hydropower Projects* guides FERC engineering staff and licensees in evaluations of dam safety. The publication is frequently revised to reflect current information and methodologies (FERC 2017).

FERC requires licensees to prepare EAPs and conducts training sessions on developing and testing these plans. The plans outline an early warning system in the event of an actual or potential sudden release of water from a dam failure. The plans include operational procedures that may be implemented during regulatory measures, such as reducing reservoir levels and downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that all applicable parties are informed of the proper procedures in emergencies (FERC 2017).

4.3.1.1 Location and Extent

Forty-three (43) dams are present throughout Chester County, as shown on Figure 4.3.1-1. The vast majority of these dams pose little risk; however, 17 Hazard Category 1 “high-hazard” dams require EAPs. Table 4.3.1-2 lists dam classification definitions. Table 4.3.1-3 is a complete list of dams in Chester County with “high-hazard” dams listed first.



Figure 4.3.1-1. Dams in Chester County

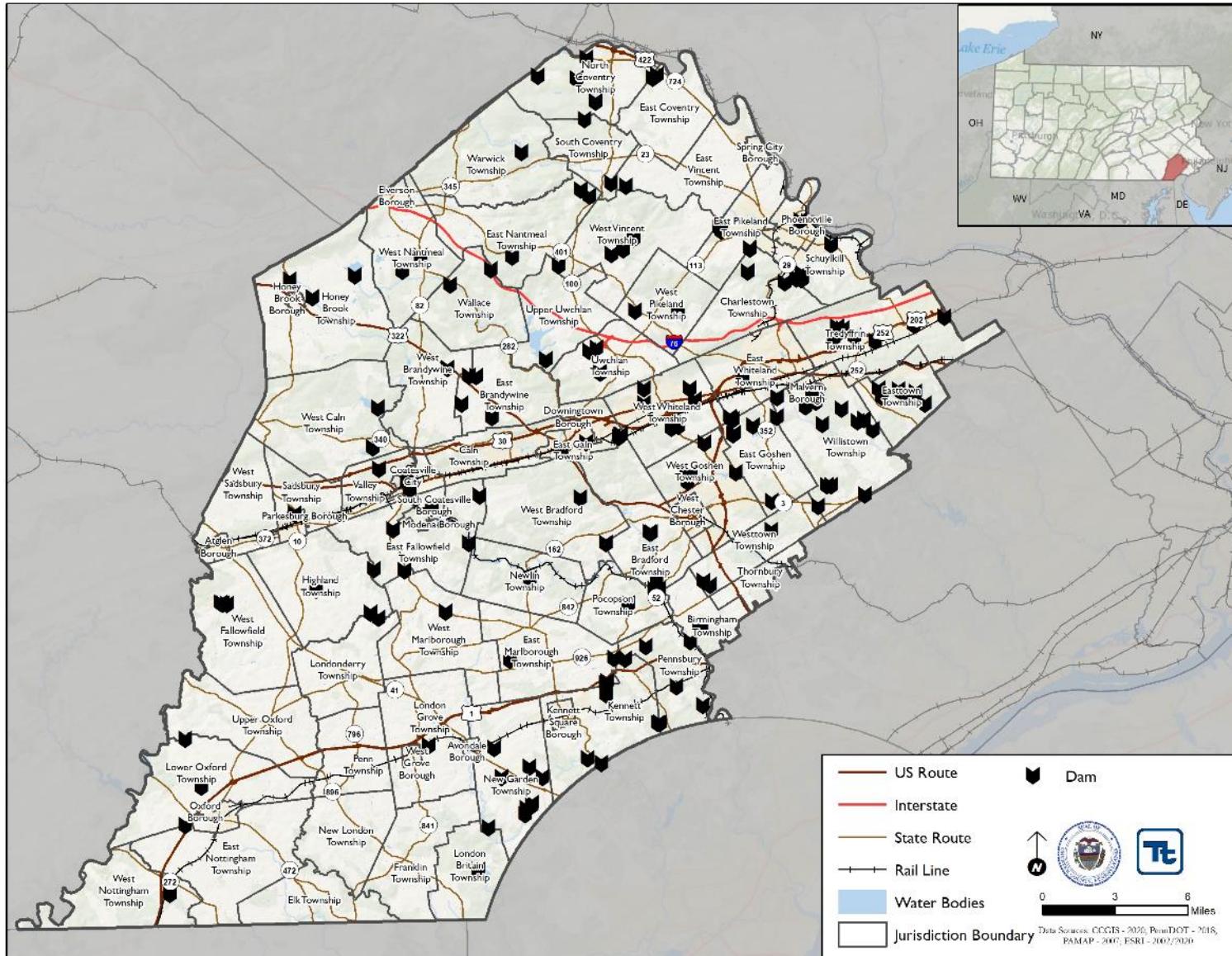




Table 4.3.1-2. Dam Classification Definitions

Size Category		
Category	Impoundment Storage (Acre-feet)	Dam Height (Feet)
A	Equal to or greater than 50,000	Equal to or greater than 100
B	Less than 50,000 but greater than 1,000	Less than 100 but greater than 40
C	Equal to or less than 1,000	Equal to or less than 40
Hazard Potential Category		
Category	Population at Risk	Economic Loss
1	Substantial (Numerous homes or small businesses or a large business or school)	Excessive, such as extensive residential, commercial, or agricultural damage, or substantial public inconvenience
2	Few (A small number of homes or small businesses)	Appreciable, such as limited residential, commercial, or agricultural damage, or moderate public inconvenience
3	None expected (no permanent structures for human habitation or employment)	Significant damage to private or public property and short-duration public inconvenience such as damage to storage facilities or loss of critical stream crossings
4	None expected (no permanent structures for human habitation or employment)	Minimal damage to private or public property and no significant public inconvenience

Source: Commonwealth of Pennsylvania 2011.

Table 4.3.1-3. Dams in Chester County

Dam Name	Municipality	Stream	Class	Permittee
High-Hazard Dams				
Barnestown (PA 432)	Wallace Township	East Branch Brandywine Creek	B-1	Chester County Water Resources Authority
Beaver Creek (PA-433)	West Brandywine and East Brandywine Townships	Beaver Creek	C-1	Chester County Water Resources Authority
Herr Food Storage Lagoon	Elizabeth Township	ADJ to Northeast Creek	B-1	Herr Foods, Inc
Hibernia (PA-436F)	West Caln Township	Birch Run	C-1	Chester County Water Resources Authority
Lake Somerset	Manheim Township	Broad Run	C-1	Somerset Lake Service Corporation
Leopard Lake	Martic Township	Darby Creek	B-1	Leopard Lakes Farm, Inc.
Lincoln Avenue Detention Basin	Martic Township	TR East Brandywine Creek	B-1	Downingtown Borough
Marsh Creek Reservoir (PA-437)	Downingtown	TR Crum Creek	C-1	DCNR
Milltown	East Goshen Township	East Branch Chester Creek	C-1	East Goshen Municipal Authority
Pickering Creek	Schuylkill Township	Pickering Creek	B-1	Aqua Pennsylvania, Inc
Pine Grove	Pine Grove	Octoraro Creek	C-4	Chester Water Authority
R G Struble Lake (PA-431)	Honey Brook Township	East Branch Brandywine Creek	B-1	Chester County Water Resources Authority
Rock Run	West Caln Township	Rock Run	B-1	Pennsylvania American Water Company
Township Line (Airport Road)	West Goshen Township	East Branch Chester Creek	B-1	Aqua Pennsylvania, Inc.



Section 4.3.1: Risk Assessment – Dam Failure

Dam Name	Municipality	Stream	Class	Permittee
Walker Farm Lagoon	East Marlborough Township	TR West Branch Red Clay Creek	C-2	East Marlborough Township
Welkinweir	East Nantmeal Township	TR Beaver Run	C-1	Green Valleys Association
Wharton Boulevard Stormwater	Uwchlan Township	Shamona Creek	C-1	Eagleview Town Center Condominium Association, Inc.
Other Dams				
Brook Crossing Detention	Brecknock Township	East Branch Brandywine Creek	C-4	East Fallowfield Township
Chester CO. Prison Storage Detention Lagoon	Brecknock Township	Watershed Pocopson Creek	C-4	Chester County Facilities Department
Cold Springs Park	North Coventry Township	TR Schuylkill River	C-4	Patty Barra
Crossing No 3	Clay Township	TR Bucktoe Creek	C-4	Hartfield Homeowners Association
Crossing No 5	Clay Township	Bucktoe Creek	C-4	Hartfield Homeowners Association
Devon Detention	Clay Township	TR Darby Creek	C-4	Waynesbrook Homeowners Association
Green Valley Farms	Colerain Township	Trout Run	C-4	Green Valley Farms
Hankin	Conestoga Township	Shamona Creek	C-4	The Hankin Group
Hershey Mill	East Goshen Township	Ridley Creek	C-3	East Goshen Township
Linpro Detention Basin	Conoy Township	TR Little Valley Creek	C-4	Brandywine Operating Partnership, LP
Malvern Preparatory Lower	Malvern Borough	TR Crum Creek	C-3	Malvern Prep School
Osborne Lagoon	Drumore Township	Watershed Leech Run	C-4	Oxford Area Sewer Authority
Pond #3	Earl Township		C-4	Hanson Aggregates Pennsylvania Inc.
Pond No 1	Earl Township	TR Valley Creek	C-4	General Crushed Stone Company
Pond No 2	Earl Township	TR Valley Creek	C-4	General Crushed Stone Company
Pond No 3	East Cocalico Township	TR Valley Creek	C-4	General Crushed Stone Company
Pond View Farm	East Cocalico Township	Ridley Creek	C-4	Joseph and Pat Bellanca
Savery Mill	East Donegal Township	Bennetts Run	C-4	Savery Mill Homeowners Association
Somerset Lakes Basin No 2	East Earl Township	TR Broad Run	C-4	Somerset Lake Service Corporation
Thomas Meeting Detention Basin	East Earl Township	TR Valley Creek	C-4	Thomas Meeting Associates
Timber	East Earl Township	TR Culbertson Run	C-4	Villages at Timberlake
Washburn Lake	East Earl Township	TR Pigeon Creek	C-4	Christopher H. and Patricia C. Washburn
Wastewater Treatment	East Hempfield Township	Watershed TR Tweed Creek	C-4	Oxford Area Sewer Authority
West Whiteland Business Park	East Hempfield Township	TR Valley Creek	C-4	Whiteland Business Park Owners Association
Westtown	Westtown Township	Hickman Run	C-3	Westtown School
Whiteford Ridge Detention Basin	East Lampeter Township	TR Valley Creek	C-4	Whiteford Ridge Homeowners Association

Source: USACE 2020





Extent or magnitude of a dam failure event can be measured in terms of classification of the dam. FEMA has three classification levels of dam hazard potential: low, significant, and high. The classification levels build on each other. The hazard potential classification system should be used with the understanding that failure of any dam or water-retaining structure could represent a danger to downstream life and property (FEMA 2004). Each FEMA classification level of dam hazard potential is described as follows:

- Low-hazard potential dams are those where failure or misoperation would result in no probable loss of human life and low economic or environmental losses. Losses are principally limited to the owner’s property.
- Significant-hazard potential dams are those where failure or misoperation would result in no probable loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant-hazard potential dams are often located in predominantly rural or agricultural areas.
- High-hazard potential dams are those where failure or misoperation will probably cause loss of human life.

Table 4.3.1-4 lists USACE-developed classifications of hazard potentials of dam failures, based only on potential consequences of a dam failure; this classification does not consider probability of failure.

Table 4.3.1-4. U.S. Army Corps of Engineers Hazard Potential Classification

Hazard Category ¹	Direct Loss of Life ²	Lifeline Losses ³	Property Losses ⁴	Environmental Losses ⁵
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

¹ Categories are assigned to overall projects, not individual structures at a project.

² Loss-of-life potential is based on inundation mapping of area downstream of the project. Analysis of loss-of-life potential should consider the population at risk, time of flood wave travel, and warning time.

³ Lifeline losses include indirect threats to life caused by the interruption of lifeline services from project failure or operational disruption; for example, loss of critical medical facilities or access to them.

⁴ Property losses include damage to project facilities and downstream property and indirect impact from loss of project services, such as impact from loss of a dam and navigation pool, or impact from loss of water or power supply.

⁵ Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: USACE 2016

The Beaver Creek Dam is projected to be the most significant due to the potential impact of a dam failure from this dam. Failure of this dam would create a rush of water that would impact residents in East Caln Township, Caln Township, East Brandywine Township, Downingtown Borough, and West Bradford Township.



4.3.1.2 Past Occurrence

There have been two significant dam failures in Pennsylvania. The worst dam failure to occur in the U.S. took place in Johnstown, PA, in 1889 and claimed 2,209 lives. Another dam failure took place in Austin, PA, (Potter County) in 1911 and claimed 78 lives. To date, there have not been any dam failures in Chester County’s recent history.

No dam failures or incidents have been recorded in Chester County.

4.3.1.3 Future Occurrence

Likelihood of a dam failure in Chester County is difficult to predict. Dam failure events are infrequent and usually coincide with events that cause them, such as earthquakes, landslides, and excessive rainfall and snowmelt. However, the risk of such an event increases for each dam as the dam’s age increases or frequency of maintenance decreases.

“Residual risk” to dams is risk that remains after implementation of safeguards. Residual risk to dams is associated with events beyond those that the facility was designed to withstand. However, probability of any type of dam failure is low in today’s dam safety regulatory and oversight environment.

Based on Risk Factor Methodology Probability Criteria (further defined in Section 4.4), and assuming regular maintenance and inspections of the dams in Chester County, dam failures are considered *unlikely* in the county.

4.3.1.4 Vulnerability Assessment

To understand risk, a community must evaluate the assets exposed or vulnerable within the identified hazard area. The dam failure hazard is of significance to Chester County because 43 dams are present across Chester County, 17 of which are classified as high-hazard by PADEP. Warning time for dam failure is often limited. These events are frequently associated with other natural hazard events such as earthquakes, landslides, or severe weather, limiting their predictability and compounding the hazard. Populations without adequate warning of the event are highly vulnerable to this hazard. Direct and indirect losses associated with dam failures include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources.

Impact on Life, Health, and Safety

The entire population residing within a dam failure inundation zone is considered exposed and vulnerable. Of the population exposed, the economically disadvantaged and the population over the age of 65 are the most vulnerable. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact to their family. The population over the age of 65 is also highly vulnerable because they are more likely to seek or need medical attention that may not be available because of isolation during a flood event, and they may have more difficulty evacuating.

Other than the population in the dam failure inundation zone, the safety of the first responders on-scene are also at risk. First responders would be responsible for traffic control and responding to transportation accidents. There would be a higher than normal call volume and demand of first responders during a dam failure. Continuity of operations including continued delivery of services may be impeded and additional personnel would potentially be needed due to the lack of fire and police personnel in the county.

Dam failure events are frequently associated with other natural hazard events such as earthquakes, landslides, or severe weather, which limits their predictability and compounds the hazard. Populations without adequate warning of the event are highly vulnerable to this hazard.



Table 4.3.1-5 indicates the total population residing in dam inundation areas by jurisdiction. In total, there are 12,414 people in the county residing in a dam inundation zone. Of this total, the Borough of Downingtown has the greatest number of residents (4,814 people) in a dam inundation zone.

Table 4.3.1-5 Estimated Chester County Population Exposed to Dam Inundation Areas

Jurisdiction	Total Population	Population Within a Dam Inundation Area	
		Number	Percent of Total
Atglen (B)	1,459	0	0.0%
Avondale (B)	1,295	0	0.0%
Birmingham (Twp.)	4,207	306	7.3%
Caln (Twp.)	14,198	1,493	10.5%
Charlestown (Twp.)	5,813	0	0.0%
Coatesville (C)	13,147	873	6.6%
Downingtown (B)	7,929	4,814	60.7%
East Bradford (Twp.)	9,959	571	5.7%
East Brandywine (Twp.)	8,416	267	3.2%
East Caln (Twp.)	4,876	53	1.1%
East Coventry (Twp.)	6,770	172	2.5%
East Fallowfield (Twp.)	7,567	40	0.5%
East Goshen (Twp.)	18,199	586	3.2%
East Marlborough (Twp.)	7,326	0	0.0%
East Nantmeal (Twp.)	1,723	0	0.0%
East Nottingham (Twp.)	8,929	0	0.0%
East Pikeland (Twp.)	7,331	4	0.1%
East Vincent (Twp.)	10,603	110	1.0%
East Whiteland (Twp.)	7,062	0	0.0%
Easttown (Twp.)	11,415	0	0.0%
Elk (Twp.)	1,786	0	0.0%
Elverson (B)	1,405	0	0.0%
Franklin (Twp.)	4,506	0	0.0%
Highland (Twp.)	1,370	0	0.0%
Honey Brook (B)	1,865	0	0.0%
Honey Brook (Twp.)	8,205	112	1.4%
Kennett (Twp.)	8,177	0	0.0%
Kennett Square (B)	6,159	0	0.0%
London Britain (Twp.)	3,241	0	0.0%
London Grove (Twp.)	2,450	0	0.0%
Londonderry (Twp.)	8,615	0	0.0%
Lower Oxford (Twp.)	5,058	12	0.2%
Malvern (B)	3,440	0	0.0%
Modena (B)	873	351	40.2%
New Garden (Twp.)	12,111	0	0.0%
New London (Twp.)	1,312	0	0.0%
Newlin (Twp.)	5,921	787	13.3%
North Coventry (Twp.)	7,996	393	4.9%



Jurisdiction	Total Population	Population Within a Dam Inundation Area	
		Number	Percent of Total
Oxford (B)	5,420	0	0.0%
Parkesburg (B)	3,781	0	0.0%
Penn (Twp.)	5,511	0	0.0%
Pennsbury (Twp.)	3,649	143	3.9%
Phoenixville (B)	16,815	55	0.3%
Pocopson (Twp.)	4,838	249	5.1%
Sadsbury (Twp.)	3,919	0	0.0%
Schuylkill (Twp.)	8,639	26	0.3%
South Coatesville (B)	1,276	2	0.2%
South Coventry (Twp.)	2,631	0	0.0%
Spring City (B)	3,320	95	2.9%
Thornbury (Twp.)	3,181	20	0.6%
Tredyffrin (Twp.)	29,481	0	0.0%
Upper Oxford (Twp.)	2,518	0	0.0%
Upper Uwchlan (Twp.)	11,509	83	0.7%
Uwchlan (Twp.)	18,869	76	0.4%
Valley (Twp.)	7,661	131	1.7%
Wallace (Twp.)	3,678	249	6.8%
Warwick (Twp.)	2,543	0	0.0%
West Bradford (Twp.)	12,869	110	0.9%
West Brandywine (Twp.)	7,482	36	0.5%
West Caln (Twp.)	9,080	19	0.2%
West Chester (B)	19,888	0	0.0%
West Fallowfield (Twp.)	2,596	0	0.0%
West Goshen (Twp.)	23,021	110	0.5%
West Grove (B)	2,846	0	0.0%
West Marlborough (Twp.)	771	0	0.0%
West Nantmeal (Twp.)	1,999	41	2.1%
West Nottingham (Twp.)	2,718	18	0.7%
West Pikeland (Twp.)	4,069	0	0.0%
West Sadsbury (Twp.)	2,393	0	0.0%
West Vincent (Twp.)	5,257	0	0.0%
West Whiteland (Twp.)	18,403	0	0.0%
Westtown (Twp.)	10,916	8	0.1%
Willistown (Twp.)	10,895	0	0.0%
Chester County (Total)	517,156	12,414	2.4%

Sources: ACS 2014-2018 U.S. Census; Chester County GIS 2020
 Notes: B – Borough; C – City; Twp. – Township; % – Percent

Impact on General Building Stock

All buildings and infrastructure located in the dam failure inundation zone are considered exposed and vulnerable. Property located closest to the dam inundation zone has the greatest potential to experience the largest, most destructive surge of water. Table 4.3.1-6 shows the total replacement cost value for buildings within





the dam inundation area. There is a total of 5,074 buildings vulnerable to dam failure. Approximately 32 percent of these buildings sit within the Borough of Downingtown, which equates to \$1.5 billion in replacement cost value.

Table 4.3.1-6 Estimated General Building Stock Exposure to Dam Failure

Jurisdiction	Total Number of Buildings	Total RCV (Replacement Cost Value)	Buildings Within a Dam Inundation Area			
			Number of Buildings	Percent Total	RCV (Replacement Cost Value)	Percent Total
Atglen (B)	583	\$300,171,233	0	0.0%	\$0	0.0%
Avondale (B)	436	\$275,491,131	0	0.0%	\$0	0.0%
Birmingham (Twp.)	1,774	\$1,521,752,088	141	7.9%	\$127,924,821	8.4%
Caln (Twp.)	5,696	\$4,389,258,174	578	10.1%	\$584,015,106	13.3%
Charlestown (Twp.)	2,655	\$2,334,124,537	0	0.0%	\$0	0.0%
Coatesville (C)	3,545	\$2,658,702,748	277	7.8%	\$493,310,814	18.6%
Downingtown (B)	2,619	\$2,678,308,815	1,632	62.3%	\$1,584,749,201	59.2%
East Bradford (Twp.)	4,033	\$3,166,888,223	250	6.2%	\$181,914,091	5.7%
East Brandywine (Twp.)	4,201	\$2,499,920,165	166	4.0%	\$101,465,130	4.1%
East Caln (Twp.)	1,509	\$1,864,909,402	52	3.4%	\$119,577,449	6.4%
East Coventry (Twp.)	3,832	\$2,200,926,728	137	3.6%	\$150,739,263	6.8%
East Fallowfield (Twp.)	4,025	\$1,984,687,476	23	0.6%	\$12,227,680	0.6%
East Goshen (Twp.)	6,498	\$5,680,635,001	197	3.0%	\$121,553,030	2.1%
East Marlborough (Twp.)	3,888	\$3,646,563,821	0	0.0%	\$0	0.0%
East Nantmeal (Twp.)	1,509	\$1,131,945,456	0	0.0%	\$0	0.0%
East Nottingham (Twp.)	4,960	\$3,185,167,607	0	0.0%	\$0	0.0%
East Pikeland (Twp.)	3,959	\$2,751,413,608	17	0.4%	\$124,930,910	4.5%
East Vincent (Twp.)	3,872	\$2,764,012,516	48	1.2%	\$23,873,512	0.9%
East Whiteland (Twp.)	5,002	\$8,143,686,632	0	0.0%	\$0	0.0%
Easttown (Twp.)	4,583	\$3,998,338,009	0	0.0%	\$0	0.0%
Elk (Twp.)	1,361	\$754,193,647	0	0.0%	\$0	0.0%
Elverson (B)	716	\$516,332,051	0	0.0%	\$0	0.0%
Franklin (Twp.)	2,468	\$1,537,535,450	0	0.0%	\$0	0.0%
Highland (Twp.)	1,304	\$1,067,555,265	0	0.0%	\$0	0.0%
Honey Brook (B)	771	\$446,825,932	0	0.0%	\$0	0.0%
Honey Brook (Twp.)	4,871	\$3,389,705,910	58	1.2%	\$20,469,746	0.6%
Kennett (Twp.)	4,166	\$4,134,894,338	0	0.0%	\$0	0.0%
Kennett Square (B)	1,956	\$1,600,982,472	0	0.0%	\$0	0.0%
London Britain (Twp.)	1,782	\$1,064,040,035	0	0.0%	\$0	0.0%
London Grove (Twp.)	4,233	\$3,148,102,405	0	0.0%	\$0	0.0%



Jurisdiction	Total Number of Buildings	Total RCV (Replacement Cost Value)	Buildings Within a Dam Inundation Area			
			Number of Buildings	Percent Total	RCV (Replacement Cost Value)	Percent Total
Londonderry (Twp.)	1,755	\$1,034,199,367	0	0.0%	\$0	0.0%
Lower Oxford (Twp.)	2,585	\$2,325,017,464	19	0.7%	\$9,341,854	0.4%
Malvern (B)	1,149	\$1,256,307,741	0	0.0%	\$0	0.0%
Modena (B)	226	\$143,886,459	98	43.4%	\$97,595,622	67.8%
New Garden (Twp.)	5,418	\$5,996,313,471	0	0.0%	\$0	0.0%
New London (Twp.)	2,955	\$1,850,994,293	0	0.0%	\$0	0.0%
Newlin (Twp.)	1,188	\$767,919,221	137	11.5%	\$71,507,516	9.3%
North Coventry (Twp.)	4,367	\$2,814,129,243	265	6.1%	\$145,462,949	5.2%
Oxford (B)	1,795	\$1,620,222,123	0	0.0%	\$0	0.0%
Parkesburg (B)	1,478	\$791,790,495	0	0.0%	\$0	0.0%
Penn (Twp.)	2,962	\$3,335,917,017	0	0.0%	\$0	0.0%
Pennsbury (Twp.)	1,793	\$1,741,030,601	81	4.5%	\$83,498,009	4.8%
Phoenixville (B)	6,031	\$4,404,373,172	46	0.8%	\$237,135,626	5.4%
Pocopson (Twp.)	1,781	\$1,616,048,060	102	5.7%	\$114,933,221	7.1%
Sadsbury (Twp.)	2,244	\$1,514,078,865	0	0.0%	\$0	0.0%
Schuylkill (Twp.)	4,116	\$3,296,773,180	42	1.0%	\$73,855,475	2.2%
South Coatesville (B)	669	\$656,482,254	62	9.3%	\$258,171,934	39.3%
South Coventry (Twp.)	1,655	\$1,175,837,157	0	0.0%	\$0	0.0%
Spring City (B)	1,282	\$913,935,869	103	8.0%	\$325,582,321	35.6%
Thornbury (Twp.)	1,222	\$1,249,939,720	11	0.9%	\$8,727,080	0.7%
Tredyffrin (Twp.)	10,751	\$13,427,976,905	0	0.0%	\$0	0.0%
Upper Oxford (Twp.)	2,098	\$1,327,197,078	0	0.0%	\$0	0.0%
Upper Uwchlan (Twp.)	4,459	\$3,757,709,779	34	0.8%	\$29,307,678	0.8%
Uwchlan (Twp.)	6,633	\$7,025,589,763	26	0.4%	\$13,440,867	0.2%
Valley (Twp.)	3,430	\$2,597,377,442	77	2.2%	\$330,922,211	12.7%
Wallace (Twp.)	2,069	\$1,322,743,721	157	7.6%	\$112,730,185	8.5%
Warwick (Twp.)	2,175	\$1,133,542,100	0	0.0%	\$0	0.0%
West Bradford (Twp.)	6,163	\$3,995,074,181	85	1.4%	\$61,477,406	1.5%
West Brandywine (Twp.)	4,149	\$2,231,906,820	21	0.5%	\$9,110,251	0.4%
West Caln (Twp.)	6,021	\$2,765,167,902	19	0.3%	\$7,656,710	0.3%
West Chester (B)	4,156	\$5,374,643,016	0	0.0%	\$0	0.0%
West Fallowfield (Twp.)	2,171	\$1,743,066,295	0	0.0%	\$0	0.0%
West Goshen (Twp.)	8,399	\$9,444,801,871	42	0.5%	\$21,952,790	0.2%
West Grove (B)	1,053	\$499,625,186	0	0.0%	\$0	0.0%



Jurisdiction	Total Number of Buildings	Total RCV (Replacement Cost Value)	Buildings Within a Dam Inundation Area			
			Number of Buildings	Percent Total	RCV (Replacement Cost Value)	Percent Total
West Marlborough (Twp.)	967	\$997,081,475	0	0.0%	\$0	0.0%
West Nantmeal (Twp.)	1,830	\$1,139,858,316	34	1.9%	\$15,508,576	1.4%
West Nottingham (Twp.)	1,989	\$1,196,217,005	28	1.4%	\$15,728,905	1.3%
West Pikeland (Twp.)	2,120	\$1,506,034,830	0	0.0%	\$0	0.0%
West Sadsbury (Twp.)	1,876	\$1,651,357,888	0	0.0%	\$0	0.0%
West Vincent (Twp.)	3,532	\$2,587,356,437	0	0.0%	\$0	0.0%
West Whiteland (Twp.)	7,022	\$7,660,221,171	0	0.0%	\$0	0.0%
Westtown (Twp.)	4,175	\$3,282,102,771	9	0.2%	\$11,128,477	0.3%
Willistown (Twp.)	6,043	\$4,727,817,226	0	0.0%	\$0	0.0%
Chester County (Total)	232,759	\$194,736,735,824	5,074	2.2%	\$5,701,526,414	2.9%

Sources: Chester County GIS 2020; RS Means 2019
 Notes: B – Borough; C – City; Twp. – Township; % – Percent

Impact on Critical Facilities

Dam failures may also impact critical facilities and infrastructure located in the downstream inundation zone. Consequentially, dam failure can cut evacuation routes, limit emergency access, and/or create isolation issues. Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Widespread damage to buildings and infrastructure affected by an event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat and utilities are returned to a functioning state. Further, utilities such as overhead power lines, cable, and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

Critical facility exposure to the dam failure boundary was examined. Table 4.3.1-7 lists critical facilities and utilities within the dam inundation area. Refer to Section 4 (County Profile) for more information about the critical facilities and lifelines in Chester County.



Table 4.3.1-7 Critical Facilities and Utilities Within the Dam Inundation Zone

Jurisdiction	Facility Types																								
	Bridge	Child Care Facility	Church	Dam	District Court	Electrical Substation	Emergency Operations Center	EMS Station	Fire Station	Historic	Long Term Care	Major Business	Military	Municipal Building	POD	Police Station	Post Office	Potable Water Treatment Plant	Radio Tower	Rail Station	SARA Site	School	Sewer Plant	Telecom	Wastewater Treatment
Atglen (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avondale (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birmingham (Twp.)	4	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caln (Twp.)	12	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	1	0	0	1	0	0	0
Charlestown (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coatesville (C)	9	1	0	2	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Downingtown (B)	14	4	6	1	0	1	1	1	2	2	0	5	1	1	1	1	0	1	0	2	8	8	0	1	0
East Bradford (Twp.)	13	0	0	2	0	1	0	1	0	8	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1
East Brandywine (Twp.)	12	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
East Caln (Twp.)	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0
East Coventry (Twp.)	9	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
East Fallowfield (Twp.)	2	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Goshen (Twp.)	6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Marlborough (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Nantmeal (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Nottingham (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Jurisdiction	Facility Types																							
	Bridge	Child Care Facility	Church	Dam	District Court	Electrical Substation	Emergency Operations Center	EMS Station	Fire Station	Historic	Long Term Care	Major Business	Military	Municipal Building	POD	Police Station	Post Office	Potable Water Treatment Plant	Radio Tower	Rail Station	SARA Site	School	Sewer Plant	Telecom
East Pikeland (Twp.)	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
East Vincent (Twp.)	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	3	0	0	0
East Whiteland (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Easttown (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elk (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elverson (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highland (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Brook (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Brook (Twp.)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kennett (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kennett Square (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
London Britain (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
London Grove (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Londonderry (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Oxford (Twp.)	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvern (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Modena (B)	2	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0	1	0	0	0	2	0	0	0



Jurisdiction	Facility Types																								
	Bridge	Child Care Facility	Church	Dam	District Court	Electrical Substation	Emergency Operations Center	EMS Station	Fire Station	Historic	Long Term Care	Major Business	Military	Municipal Building	POD	Police Station	Post Office	Potable Water Treatment Plant	Radio Tower	Rail Station	SARA Site	School	Sewer Plant	Telecom	Wastewater Treatment
New Garden (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New London (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newlin (Twp.)	8	0	0	1	0	0	1	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
North Coventry (Twp.)	11	0	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Oxford (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkesburg (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Penn (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pennsbury (Twp.)	6	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phoenixville (B)	8	0	0	2	0	0	0	0	0	4	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0
Pocopson (Twp.)	5	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Sadsbury (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schuylkill (Twp.)	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0
South Coatesville (B)	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
South Coventry (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spring City (B)	2	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	1	0	1	0	0
Thornbury (Twp.)	5	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tredyffrin (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Oxford (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Uwchlan (Twp.)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Jurisdiction	Facility Types																								
	Bridge	Child Care Facility	Church	Dam	District Court	Electrical Substation	Emergency Operations Center	EMS Station	Fire Station	Historic	Long Term Care	Major Business	Military	Municipal Building	POD	Police Station	Post Office	Potable Water Treatment Plant	Radio Tower	Rail Station	SARA Site	School	Sewer Plant	Telecom	Wastewater Treatment
Uwchlan (Twp.)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Valley (Twp.)	8	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wallace (Twp.)	9	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	1	0	0	0	2	0	0	1	0
Warwick (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Bradford (Twp.)	9	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
West Brandywine (Twp.)	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Caln (Twp.)	2	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Chester (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Fallowfield (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Goshen (Twp.)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Grove (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Marlborough (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Nantmeal (Twp.)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Nottingham (Twp.)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Pikeland (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Sadsbury (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Vincent (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Jurisdiction	Facility Types																								
	Bridge	Child Care Facility	Church	Dam	District Court	Electrical Substation	Emergency Operations Center	EMS Station	Fire Station	Historic	Long Term Care	Major Business	Military	Municipal Building	POD	Police Station	Post Office	Potable Water Treatment Plant	Radio Tower	Rail Station	SARA Site	School	Sewer Plant	Telecom	Wastewater Treatment
West Whiteland (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westtown (Twp.)	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Willistown (Twp.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chester County (Total)	187	7	11	25	1	6	3	4	5	50	1	13	1	3	1	1	4	3	1	2	31	9	8	3	1

Sources: Chester County GIS 2020
 Notes: B – Borough; C – City; Twp. – Township;



Impact on the Economy

Severe flooding that follows an event like a dam failure can cause extensive structural damage and withhold essential services. The cost to recover from flood damages after a surge will vary depending on the hazard risk of each dam. Severe flooding that follows an event like a dam failure can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur, and drinking water and wastewater treatment facilities can become temporarily out of operation. Debris from surrounding buildings can accumulate should the dam mimic major flood events, such as the 1 percent annual chance flood event that is discussed in Section 4.3.6 (Flood, Flash Flood, Ice Jam).

Impact on the Environment

The environment is vulnerable to several risks in the event of a dam failure. Water releases from dams usually contain very little suspended sediment; this can lead to scouring of riverbeds and banks. The inundation may introduce foreign elements into local waterways, resulting in destruction of downstream habitat and impacting many animal and plant species, especially endangered species. The subsequent rush of water downstream can rapidly increase flow rate and turbidity of streams and rivers in minor dam failures or overwhelm terrestrial habitat with floodwaters in severe dam failures.

Cascading Impacts to Other Hazards

Dam failures can often result in the release of hazardous materials, either swept up in floodwaters or in sediment that is contained behind the dam, such as in areas with mining upstream. After the flood waters subside, contaminated and flood-damaged building materials and contents must be disposed of properly. Contaminated sediment must be removed from buildings, yards, and properties.

Dam failures may result in significant water quality and debris disposal issues. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooding waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals get added to flood waters. Water supplies and wastewater treatment could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be disposed of properly. Please reference Sections 4.3.6 (Flood, Flash Flood, Ice Jams) and 4.3.4. (Environmental Hazard Materials) for more information.

Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

An increase in development and population can increase likelihood of a dam failure incident. Future migration to larger jurisdictions may also increase the likelihood of an incident. The tables and hazard maps included in the jurisdictional annexes contain additional information regarding the specific areas of development that would increase county vulnerability to dam inundation areas.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicates that Chester County's population will continue to increase into 2040, increasing total population to approximately 603,068 persons



(The Center of Rural Pennsylvania 2013). Persons that move into dam inundation areas are at greater risk to be impacted if there is a dam failure event.

Climate Change

The June 2009 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21st century (PADEP 2009). Increased precipitation will occur in the form of heavy rainfalls, which have the potential to increase the risk to dam failures. Increases in precipitation may stress the dam wall. Existing dams may not be able to retain and manage increases in water flow from more frequent, heavy rainfall events. Heavy rainfalls may result in more frequent overtopping of these dams and flooding of the county’s assets in adjacent inundation areas. However, the probable maximum flood used to design each dam may be able to accommodate changes in climate.

Change of Vulnerability Since the 2015 HMP

This vulnerability assessment was based on the most current and best available data, including updated building and critical facility inventories. For future HMP updates, additional dam failure inundation areas can be delineated and used to spatially assess the asset exposure. A customized general building stock list could be generated in the Hazus model to assess future impacts at the structural level versus the census-block level. Depth grids could be generated for the inundation areas and used in Hazus to estimate potential losses similar to those listed in the flood profile (Section 4.3.7).



4.3.2 Drought and Water Supply Deficiencies

This section provides a profile and vulnerability assessment of the drought and water supply deficiencies hazard in Chester County. Drought is a period characterized by long durations of below-normal precipitation. Drought conditions occur in virtually all climatic zones, yet characteristics of drought vary significantly from one region to another, relative to normal precipitation within respective regions. Drought and water supply deficiencies can affect agriculture, water reserve, aquatic ecology, wildlife, and plant life. Drought is a temporary irregularity in typical weather patterns and differs from aridity, which reflects low rainfall within a specific region and is a permanent feature of the climate of that area.

Drought can be defined or grouped into four categories:

- Meteorological drought is a measure of departure of precipitation from normal, defined solely by reference to relative degree of dryness. Because of climatic differences, dryness considered a drought at one location of the country may not be considered drought at another location.
- Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, and other parameters. Agricultural drought occurs when not enough water is available for a crop to grow at a particular time. Agricultural drought is defined in terms of soil moisture deficiencies relative to water demands of plant life, primarily crops.
- Hydrological drought is associated with below-normal surface or subsurface water supply resulting from periods of precipitation shortfalls (including snowfall). Hydrological drought is related to effects of precipitation shortfalls on stream flows and water levels in reservoirs, lakes, and groundwater.
- Socioeconomic drought is associated with supply and demand of an economic good, with elements of meteorological, hydrological, and agricultural drought categories. This differs from the aforementioned types of drought because its occurrence depends on supply and demand to identify or classify droughts. Supplies of many economic goods, such as water, silage, food grains, fish, and hydroelectric power, depend on weather. Socioeconomic drought occurs when demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply (National Drought Mitigation Center ([NDMC] 2017).

Drought and water supply deficiencies can affect many sectors of an economy and can reach beyond an area undergoing physical drought. Because water is essential for producing goods and providing services, drought can reduce crop yield, increase fire hazard, lower water levels, and damage wildlife and fish habitats. Further consequences include: reductions in crop yields, rangeland, and forest productivity that may lower incomes of farmers and agribusinesses; increase in prices of food and timber; increase in unemployment; reduction of tax revenues as expenditures decline; increase in crime, foreclosures, and migration; and depletion of disaster relief funds. The many impacts of drought can be categorized as economic, environmental, or social.

4.3.2.1 Location and Extent

Droughts and water supply deficiencies are regional in scope and may affect the entirety of Chester County rather than only individual municipalities within the county. Droughts and water supply deficiencies may also concurrently affect other counties near Chester County, or even the entire Commonwealth. Generally, areas along waterways will reveal drought conditions later than areas away from waterways.

Climate divisions are regions within a state that are climatically homogenous. The National Oceanic and Atmospheric Administration (NOAA) has divided the United States into 359 climate divisions. The boundaries

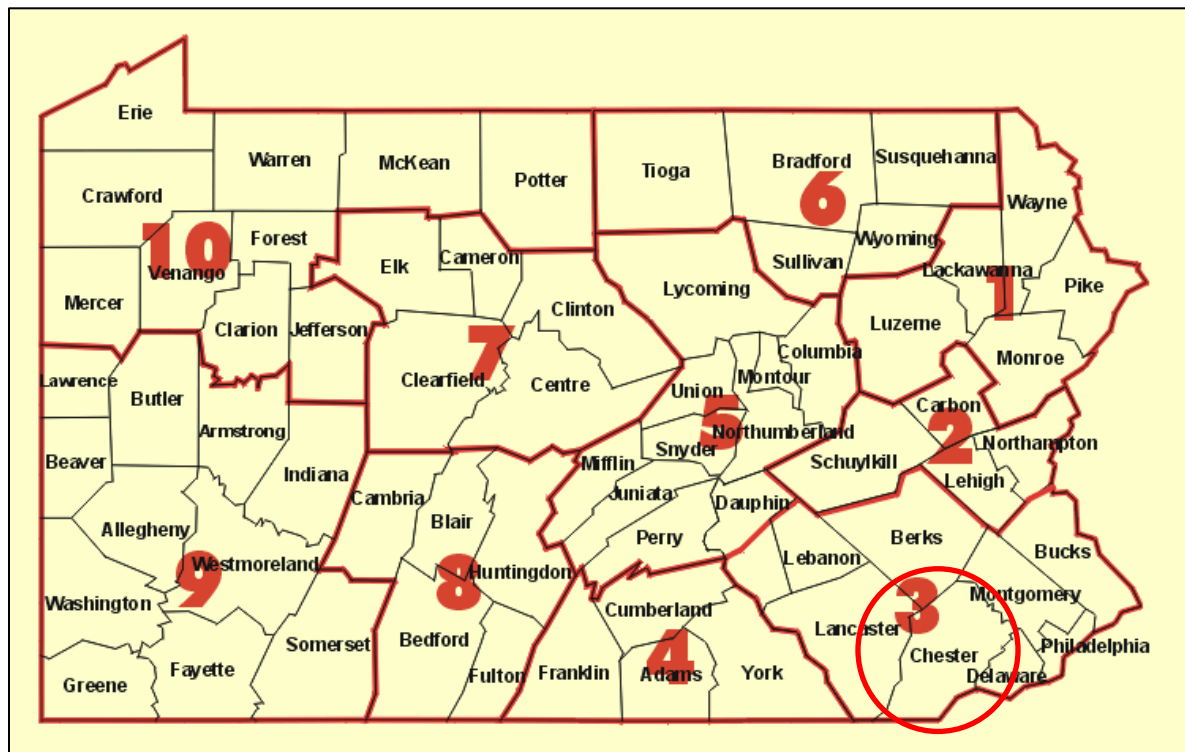


Section 4.3.2: Risk Assessment – Drought and Water Supply Deficiencies

of these divisions typically coincide with county boundaries, except in the western United States where they are based largely on drainage basins (National Weather Service [NWS] 2005).

According to NOAA, Pennsylvania includes 10 climate divisions: Pocono Mountains, East Central Mountains, Southeastern Piedmont, Lower Susquehanna, Middle Susquehanna, Upper Susquehanna, Central Mountains, South Central Mountains, Southwest Plateau, and Northwest Plateau Climate Division (National Centers for Environmental Information [NCEI] 2012). Figure 4.3.2-1 shows the climate divisions of Pennsylvania. Chester County is within the Southeastern Piedmont climate division.

Figure 4.3.2-1. Climate Divisions of Pennsylvania



Source: NWS 2005

Note: Highlight added.

The climate divisions for Pennsylvania are:

- 1 = Pocono Mountains; 2 = East Central Mountains; 3 = Southeastern Piedmont; 4 = Lower Susquehanna; 5 = Middle Susquehanna; 6 = Upper Susquehanna; 7 = Central Mountains; 8 = South Central Mountains; 9 = Southwest Plateau; 10 = Northwest Plateau

Water supplies are vulnerable to effects of drought and thus can impact the severity of a drought, particularly at locations where citizens rely on wells for drinking water. Residents depending on well water can more easily handle short-term droughts without major inconveniences than can populations that rely on surface water. However, longer-term droughts inhibit groundwater aquifers from recharging and can thus extend the problems of well owners for an indeterminate amount of time. Chester County residents who depend on private domestic wells have this greater “hidden vulnerability” to droughts. According to the United States Geological Survey (USGS) National Water Information System, the 2015 average daily domestic self-supplied groundwater withdrawals of fresh water in Chester County was 12.68 million gallons (Mgal) per day.

Table 4.3.2-1 lists the number of reported domestic wells within each municipality of Chester County. The well data were obtained from the Pennsylvania Groundwater Information System (PaGWIS). PaGWIS is maintained by PA DCNR and relies on voluntary submissions of well record data by well drillers; as a result, it is not a complete database of all domestic wells in the county. It is, however, the most complete dataset of domestic wells available.



Table 4.3.2-1. Domestic Wells in Chester County

Municipality	Number of Reported Domestic Wells	Municipality	Number of Reported Domestic Wells
Atglen Borough	0	North Coventry Township	1014
Avondale Borough	99	Oxford Borough	743
Birmingham Township	373	Parquesburg Borough	60
Caln Township	569	Penn Township	626
Charlestown Township	996	Pennsbury Township	717
Coatesville City	1910	Phoenixville Borough	166
Downingtown Borough	122	Pocopson Township	665
East Bradford Township	891	Sadsbury Township	487
East Brandywine Township	1138	Schuylkill Township	318
East Caln Township	124	South Coatesville Borough	38
East Coventry Township	879	South Coventry Township	572
East Fallowfield Township	1034	Spring City Borough	35
East Goshen Township	589	Thornbury Township	332
East Marlborough Township	1350	Tredyffrin Township	578
East Nantmeal Township	515	Upper Oxford Township	614
East Nottingham Township	1592	Upper Uwchlan Township	1035
East Pikeland Township	752	Uwchlan Township	473
East Vincent Township	1047	Valley Township	505
East Whiteland Township	668	Wallace Township	1047
Easttown Township	359	Warwick Township	620
Elk Township	475	West Bradford Township	1286
Elverson Borough	349	West Brandywine Township	1347
Franklin Township	1126	West Caln Township	2133
Highland Township	309	West Chester Borough	380
Honey Brook Borough	531	West Fallowfield Township	558
Honey Brook Township	523	West Goshen Township	825
Kennett Square Borough	110	West Grove Borough	25
Kennett Township	1285	West Marlborough Township	250
London Britain Township	940	West Nantmeal Township	616
London Grove Township	966	West Nottingham Township	525
Londonderry Township	458	West Pikeland Township	869
Lower Oxford Township	608	West Sadsbury Township	596
Malvern Borough	31	West Vincent Township	1103
Modena Borough	72	West Whiteland Township	785
New Garden Township	1339	Westtown Township	461
New London Township	1090	Willistown Township	884
Newlin Township	500	-	-

Source: PA DCNR 2017a

In addition to domestic wells in the county, some residents also receive their water from municipal water providers. There are 16 water purveyors providing water to residents. Primary water sources include Octorara and Schuylkill Rivers, the east and west branches of the Brandywine Creek, and Pickering Creek. AQUA Pennsylvania Inc. is the largest public water provider followed by private wells. Additional municipal water



providers include Pennsylvania-American Water Company and Chester Water Authority (Chester County 2015 HMP).

Jurisdictions designated for agricultural use are particularly vulnerable to drought. Agriculture is the predominant land use in the county, representing 24 percent of land (Chester County 2020). A total of 1,191 acres of land in the county needs to be irrigated (Agricultural Census 2017). In Chester County, the following municipalities have large portions zoned for agricultural use: Elk Township, Highland Township, Honey Brook Township, Londonderry Township, Upper Oxford Township, West Caln Township, and West Fallowfield Township. Areas designated for agricultural use are illustrated in Figure 2-5 in Section 2.

4.3.2.2 Range of Magnitude

Effects of droughts vary depending on their severity, timing, duration, and location. Some droughts may exert their greatest impact on agriculture, while others may have stronger effects on water supply or recreational activities. Droughts can adversely affect the following significantly:

- Public water supplies for human consumption
- Rural water supplies for livestock consumption and agricultural operations
- Water quality
- Natural soil water or irrigation water for agriculture
- Water for forests and for fighting forest fires
- Water for navigation and recreation

PADEP and Pennsylvania Emergency Management Agency (PEMA) manage water supply droughts according to the following four conditions of drought, as defined in the Commonwealth of Pennsylvania 2019 Standard Hazard Mitigation Plan (PA HMP):

- **Drought Watch**: This is a period to alert government agencies, public water suppliers, water users, and the public regarding potential for future drought-related problems. The focus is on increased monitoring, awareness, and preparation for response in the event that conditions worsen. A request for voluntary water conservation is issued with the objective of reducing water use by 5 percent within the affected areas. Because of varying conditions, individual water suppliers or municipalities may propose more stringent conservation actions.
- **Drought Warning**: This is a drought stage involving a coordinated response to imminent drought conditions and potential water supply shortages through concerted voluntary conservation measures to avoid or reduce shortages, relieve stressed sources, develop new sources, and, if possible, forestall the need to impose mandatory water use restrictions. The objective of voluntary water conservation measures during a drought warning is to reduce overall water use by 10 to 15 percent within the affected areas. Because of varying conditions, individual water suppliers or municipalities may propose more stringent conservation actions.
- **Drought Emergency**: During this drought stage, water management entities assemble all available resources to respond to actual emergency conditions, avoid depletion of water sources, ensure at least minimum water supplies are available to protect public health and safety, support essential and high-priority water uses, and avoid unnecessary economic upsets. If deemed necessary and if ordered by the Governor during this stage, imposition of mandatory restrictions on nonessential water usage could occur as provided for in 4 *Pa. Code* Chapter 119. Objectives of water use restrictions (mandatory or voluntary) and other conservation measures during a drought emergency are to reduce consumptive water use within the affected areas by 15 percent, and to reduce total use to the extent necessary to preserve public water system supplies, avoid or mitigate local or area shortages, and ensure equitable sharing of limited supplies.



- **Local Water Rationing:** This fourth condition of drought is not defined as a drought stage. Local municipalities may, with the approval of the PEMA Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply within designated service areas. These individual water rationing plans, authorized through provisions of 4 Pa. Code Chapter 120, require specific limits on individual water consumption to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing practices, procedures are specified for granting variances in consideration of individual hardships and economic dislocations (PEMA 2019).

Pennsylvania uses five parameters to assess drought conditions: precipitation deficits, stream flows, reservoir storage levels, groundwater levels, and a measure of soil moisture. These are described in detail below.

- **Precipitation Deficits:** As rainfall provides the basis for both groundwater and surface water resources, precipitation deficits are the earliest indicators of a potential drought. The NWS records “normal” monthly precipitation data for each county in Pennsylvania. These figures are generated from long-term monthly and decennial averages of precipitation and are updated at the end of each decade based on the most recent 30 years. Monthly totals with less than normal values represent precipitation deficits, which are then converted to percentages of the normal values. Table 4.3.2-2 lists the drought conditions (defined in the PA HMP and noted above) indicated by various precipitation deficit percentages (PEMA 2019).

Table 4.3.2-2. Precipitation Deficit Drought Indicators for Pennsylvania

Duration of Deficit Accumulation (Months)	Drought Watch (deficit as percent of normal precipitation)	Drought Warning (deficit as percent of normal precipitation)	Drought Emergency (deficit as percent of normal precipitation)
3	25%	35%	45%
4	20%	30%	40%
5	20%	30%	40%
6	20%	30%	40%
7	18.5%	28.5%	38.5%
8	17.5%	27.5%	37.5%
9	16.5%	26.5%	36.5%
10	15%	25%	35%
11	15%	25%	35%
12	15%	25%	35%

Source: PEMA 2019

Table 4.3.2-3 lists normal monthly and annual precipitation from 1981 to 2010 (the most current three-decade data available) at the four NOAA weather stations in Chester County. Data from the NOAA weather stations are available through the NCEI, which compiles monthly and annual normal total precipitation (inches) data retrieved from both NWS Cooperative Network (COOP) and Principal Observation (First-Order) locations throughout the United States.



Table 4.3.2-3. Normal Monthly and Annual Precipitation (total in inches) from 1981 to 2010 at NOAA Weather Stations in Chester County

Station Name	January	February	March	April	May	June	July	August	September	October	November	December	ANNUAL
Glenmoore	3.63	3.22	4.13	4.11	4.24	4.06	5.03	4.05	4.56	4.18	3.81	4.01	49.03
Honey Brook 2 SSE	3.02	2.49	3.70	3.63	4.03	3.88	4.96	3.80	4.19	4.16	3.65	3.71	45.22
Phoenixville 1 E	3.17	2.74	3.59	3.76	3.67	3.49	4.18	3.55	4.30	3.66	3.54	3.71	43.36
West Chester 2 NW	3.45	3.22	4.30	3.79	4.21	3.79	4.09	3.79	5.14	4.15	3.78	4.13	47.84

Source: Arguez et al 2010

- Stream Flows:** Stream flows, which typically lag up to 2 months behind normal precipitation amounts in signaling a drought, offer the second earliest indication of drought conditions. PA DEP uses 61 USGS-maintained stream gauges throughout the Commonwealth as its drought monitoring network, computing 30-day average stream flow values for each stream gauge based on the entire period of record for each gauge. The USGS Drought status is determined from stream flows based on exceedances rather than percentages. The various stages of drought watch, warning, and emergency conditions are indicated, respectively, by 75, 90, and 95 percent exceedances of 30-day average flows (PEMA 2018). NWS tracks stream gages throughout the Commonwealth and provides real-time information (<https://water.weather.gov/ahps/region.php?state=pa>).
- Groundwater Levels:** Groundwater levels for each day are used to calculate the average level of the preceding 30 days. This 30-day value is compared to the values derived from historical records yielding a percentile indicating how much time the groundwater levels have been below the historical average levels. USGS also maintains a network of groundwater monitoring wells, recently upgraded to include at least one well in each county. Groundwater measurements are used to indicate drought status in a manner similar to stream flows. Groundwater level exceedances of 75, 90, and 95 percent are used to indicate watch, warning, and emergency status. In this case, the 30-day average depth to groundwater is measured and monitored, again in relation to long-term 30-day averages based on the period of record for each county well (PEMA 2018).
- Soil Moisture:** Soil moisture is measured using an algorithm calibrated for relatively homogeneous regions that measures dryness based on temperature and precipitation in the area using information provided by NOAA. This generates a value called the Palmer Drought Severity Index (PDSI), which is compiled by the Climate Prediction Center of the National Weather Service on a weekly basis. A PDSI of -4.00 or less indicates a drought emergency; a value between -3.00 and -3.99 indicates a drought warning, and a value between -2.00 and -2.99 indicates a drought watch (PEMA 2018).
- Reservoir Storage Levels:** Water level storage in several large public water supply reservoirs (especially three New York City reservoirs in the Upper Delaware River Basin) is the fifth indicator that PA DEP uses for drought monitoring. Depending on the total quantity of storage and the length of the refill period for the various reservoirs, PA DEP uses varying percentages of storage draw down to indicate the three drought stages for each of the reservoirs (PEMA 2018).

Table 4.3.2-4 lists PDSI classifications. The PDSI uses 0 to reflect normal status, and negative numbers indicate droughts. For example, 0 is no drought, -2 is moderate drought, and -4 is extreme drought. Positive numbers signify excess precipitation (NDMC 2013).



Table 4.3.2-4. Palmer Drought Severity Index (PDSI) Classifications

Severity Category	PDSI Value	Drought Status
Extremely wet	4.0 or more	None
Very wet	3.0 to 3.99	None
Moderately wet	2.0 to 2.99	None
Slightly wet	1.0 to 1.99	None
Incipient wet spell	0.5 to 0.99	None
Near normal	0.49 to -0.49	None
Incipient dry spell	-0.5 to -0.99	None
Mild drought	-1.0 to -1.99	None
Moderate drought	-2.0 to -2.99	Watch
Severe drought	-3.0 to -3.99	Warning
Extreme drought	-4.0 or less	Emergency

Source: NDMC 2013; PEMA 2019

Availability and management of water supply are discussed in the 2009 Pennsylvania State Water Plan PADEP 2009, a joint effort by the Statewide Water Resources Committee and PADEP. In 2009, the PADEP Secretary approved an updated State Water Plan to guide management of Pennsylvania’s water resources over a 15-year planning horizon. As a functional planning tool for all Pennsylvania municipalities, counties, and regional planning partnerships, the State Water Plan profiles drought and resource constraints and encourages implementation of new technology and use policies to facilitate reduced water uses and resource demands at critical peak times. The State Water Plan provides inventories of water availability and an assessment of current and future water use demands and trends. It also offers strategies for improving management of water resources and waterway corridors that aim to reduce damage from extreme drought and flooding conditions (PADEP 2009b).

4.3.2.3 Past Occurrence

Historical information has been drawn from many sources regarding previous occurrences and losses associated with drought events throughout Pennsylvania and Chester County. Because so many sources were reviewed for the purpose of developing this plan, loss and impact information pertaining to many events could vary depending on the source. Therefore, accuracy of cited monetary values is based only on the available information identified during research for this plan.

According to NOAA’s NCEI storm events database, Chester County did not undergo any drought events between January 1, 1950, and May 19, 2020. No Commonwealth-wide crop or property losses were reported because of the droughts, which would have also included damage in other counties.

Since 1930, the Commonwealth of Pennsylvania has undergone 12 significant droughts. Since 1955, the Commonwealth has undergone 12 drought events that resulted in a Governor’s proclamation or a Federal Emergency Management Agency (FEMA)-declared disaster or emergency. Chester County was not included in any of the events. In addition to these events, between 1980 and 2017, PADEP indicated that Chester County has undergone 24 drought watch declarations, 17 drought warning declarations, and 15 drought emergency declarations (PADEP 2020).

According to FEMA, between 1954 and 2017, Pennsylvania underwent one drought-related disaster (DR) or emergency (EM) classified as one or a combination of the following disaster types: drought or water shortage. Because these disaster types generally cover a wide region of the Commonwealth, this single disaster may have impacted many counties. However, not all counties were included in the disaster declaration. FEMA, PEMA, and other sources indicate that Chester County has not been declared a disaster area as a result of a drought-related event (FEMA 2017). In 2019, it was reported that over 11.6 billion gallons of water were withdrawn



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from seven surface water sources to provide public water supply to Chester County residents and businesses (Chester County Water Resources Authority 2019).

Based on all sources researched, drought events between 1980 and 2020 that have affected Chester County are identified in Table 4.3.2-5. However, not all sources have been identified or researched, and therefore Table 4.3.2-5 may not include all events that have occurred throughout the county.

Table 4.3.2-5. Past Occurrences of Drought Events from 1980 to 2020

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts / PDSI Value
November 1980 – April 1982	Emergency	N/A	N/A	Not listed
November 1982- February 1983	Warning	N/A	N/A	Not listed
February - March 1983	Warning	N/A	N/A	Not listed
January - April 1985	Warning	N/A	N/A	Not listed
April - July 1985	Emergency	N/A	N/A	Not listed
July - October 1985	Emergency	DR-206	N/A	Not listed
October 22-29, 1985	Emergency	N/A	N/A	Not listed
October – December 1985	Emergency	N/A	N/A	Not listed
July- August 1998	Watch	N/A	N/A	Not listed
August- December 1988	Watch	N/A	N/A	Not listed
March- May 1989	Watch	N/A	N/A	Not listed
September- October 1991	Warning	N/A	N/A	Not listed
October 1991- January 1992	Warning	N/A	N/A	Not listed
January- April 1992	Warning	N/A	N/A	Not listed
April – June 1992	Warning	N/A	N/A	Not listed
July – September 1999	Emergency	N/A	N/A	Not listed
June- September, 1992	Watch	N/A	N/A	Not listed
September 1992- January 1993	Watch	N/A	N/A	Not listed
September 1-20, 1995	Warning	N/A	N/A	Not listed
September- November 1995	Emergency	N/A	N/A	Not listed
November – December 1995	Emergency	N/A	N/A	Not listed
October- November 1997	Warning	N/A	N/A	Not listed
November 1997- January 1998	Warning	N/A	N/A	Not listed
January- February 1998	Watch	N/A	N/A	Not listed
February- Spring 1998	Watch	N/A	N/A	Not listed
December 3-8, 1998	Watch	N/A	N/A	Not listed
December 8-14, 1998	Watch	N/A	N/A	Not listed
December 14-16, 1998	Warning	N/A	N/A	Not listed
December 1998- January 1999	Warning	N/A	N/A	Not listed
January- March 1999	Warning	N/A	N/A	Not listed
March-June 1999	Watch	N/A	N/A	Not listed
June 10-18, 1999	Warning	N/A	N/A	Not listed
June- July 1999	Warning	N/A	N/A	Not listed
July- September 1999	Emergency	N/A	N/A	Not listed
September- December 1999	Watch	N/A	N/A	Not listed
December 1999- February 2000	Watch	N/A	N/A	Not listed
February- May 2000	Watch	N/A	N/A	Not listed
August- November 2001	Watch	N/A	N/A	Not listed
November- December 2001	Warning	N/A	N/A	Not listed
December 2001- February 2002	Warning	N/A	N/A	Not listed
February- May 2002	Emergency	N/A	N/A	Not listed
May- June 2002	Emergency	N/A	N/A	Not listed
June- August 2002	Emergency	N/A	N/A	Not listed
August- September 2002	Emergency	N/A	N/A	Not listed
September- November 2002	Emergency	N/A	N/A	Not listed
November- December 2002	Emergency	N/A	N/A	Not listed
December 2002- January 2003	Watch	N/A	N/A	Not listed



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts / PDSI Value
April-June 2006	Watch	N/A	N/A	Not listed
October 2007- January 2008	Watch	N/A	N/A	Not listed
September- November 2010	Watch	N/A	N/A	Not listed
August- September 2011	Watch	N/A	N/A	Not listed
September- November 2016	Watch	N/A	N/A	Not listed
November- December 2016	Watch	N/A	N/A	Not listed
December 2016- February 2017	Watch	N/A	N/A	Not listed
February- April 2017	Watch	N/A	N/A	Not listed
April- May 2017	Watch	N/A	N/A	Not listed

Sources: PADEP 2020, NOAA NCEI 2020, FEMA 2020, USDA Disaster Declarations 2020

Notes:

FEMA Federal Emergency Management Agency

N/A Not applicable

PADEP Pennsylvania Department of Environmental Protection

Table 4.3.2-6 lists the crop loss insurance payments on claims from Chester County caused by drought events since 2012.

Table 4.3.2-6. Crop Loss Insurance Claims Due to Drought, 2012 to 2019

Crop Year	Total Claims	Crop Year	Total Claims
2012	\$97,991	2016	\$104,444
2013	\$0	2017	\$0
2014	\$1,956	2018	\$51,361
2015	\$7,953	2019	\$13,831

Source: U.S. Department of Agriculture (USDA) 2020

4.3.2.4 Future Occurrence

The frequency of droughts is difficult to forecast. Based on the drought conditions listed in Table 4.3.2-5, future occurrences of drought events are considered *likely*, as defined by the Risk Factor Methodology probability criteria (described in Section 4.4).

4.3.2.5 Vulnerability Assessment

To understand risk, a community must evaluate assets exposed and vulnerable within the identified hazard area. For the drought hazard, all of Chester County has been identified as the hazard area. Therefore, all assets (population, structures, critical facilities, and lifelines) described in the Hazard Vulnerability Summary (Section 4.4) are potentially vulnerable to a drought. This section evaluates and estimates potential impacts of the drought hazard on Chester County in the following subsections:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impacts on (1) life, health, and safety; (2) general building stock; (3) critical facilities; (4) economy; and (5) future growth and development
- Effects of climate change on vulnerability
- Further data collections that will assist in understanding this hazard over time.

Overview of Vulnerability

Chester County is vulnerable to drought. Assets at particular risk include any open land or structures along the wildland/urban interface (WUI) that could become vulnerable to the wildfire hazard caused by extended periods of low rain and high heat, usually associated with drought. In addition, water supply resources could be impacted



by extended periods of low rain. Finally, vulnerable populations could be particularly susceptible to the drought hazard with cascading impacts because of age, health conditions, and limited ability to mobilize to shelter, cooling, and medical resources.

Data and Methodology

At the time this plan was updated, insufficient data were available to model long-term potential impacts of a drought on Chester County. Over time, additional data will be collected to allow better analysis of this hazard. Preliminary assessments based on available data are provided below.

Impact on Life, Health, and Safety

Drought conditions can cause a shortage of water available for human consumption and can reduce local firefighting capabilities. Commercial fires would be a great concern in the time of drought if water supplies are being impacted. The rural areas within the county lack fire hydrants and would have to pull water from ponds, creeks, or other water sources to put out fires, which is not feasible during droughts. Social impacts of a drought include mental and physical stress, public safety threats (increased threat from forest/grass fires), health threats, conflicts among water users, reduced quality of life, and inequities in distribution of impacts and disaster relief. The infirm, young, and elderly are particularly susceptible to drought and extreme temperatures (sometimes associated with drought conditions) because of their age, health conditions, and limited ability to mobilize to shelters or cooling centers, and the difficulty in identifying medical resources. Impacts on the economy and environment may have social implications as well (New York State Disaster Preparedness Commission [NYSDDPC] 2011). For the purposes of this plan, the entire population of the county is considered vulnerable to drought events.

Impact on General Building Stock and Critical Facilities

A drought is not expected to directly affect any structures, and all are expected to be operational during a drought event. However, droughts contribute to conditions conducive to wildfires. Risk to life and property is greatest in regions where forested areas adjoin urbanized areas (high-density residential, commercial, and industrial), also known as the WUI. Therefore, all assets in and adjacent to the WUI zone, including population, structures, critical facilities, lifelines, and businesses, are considered vulnerable to wildfire.

Impact on the Economy

Drought events impact the economy, including loss of business function and damage and loss of inventory. Industries that rely on water for business may be impacted the hardest by drought (e.g., agriculture). Even though a majority of businesses will still be operational, they may be impacted aesthetically. A prolonged drought can exert serious direct and indirect economic impacts on a community or across the county. Economic impacts may include:

- Losses from crop, livestock, timber, and aquaculture production and associated businesses
- Losses from recreation providers and associated businesses
- Losses related to the increased costs resulting from increased energy demand and from shortages caused by reduced hydroelectric generation capacity
- Revenue losses for federal, state, and local governments from a reduced tax base and for financial institutions from defaults and postponed payments
- Long-term loss of economic growth and development

Loss estimates are based on lost agricultural revenues statewide. Table 4.3.2-7 below lists the county's farmland acreage exposure to the drought hazard as well as the annual market value of all agricultural products sold, as documented in the 2017 USDA Census of Agriculture. If the county would lose its agricultural yield because of a drought, total losses could amount to nearly \$570,929,000. Table 4.3.2-8 details the potential losses associated with county livestock by providing livestock totals for the county and their associated market value. Livestock, poultry, and associated products have a potential loss value of more than \$141,539,000 (USDA 2017).



Table 4.3.2-7. Estimated County Losses Relating to Agricultural Production

Impacted Farmland Acreage	Market Value of All Agricultural Products
150,514	\$712,468,000

Source: USDA 2017

Table 4.3.2-8. Estimated County Losses Relating to Agricultural Production

Livestock and Poultry	Inventory	Market Value of All Livestock, Poultry, and Their Products
Layers	113,599	\$141,539,000
Cattle and Calves	47,499	
Hogs and Pigs	21,550	
Sheep and Lambs	1,771	
Total	184,419	

Source: USDA 2017

Note: Market value of livestock and poultry is only provided by total value and not available by category.

Impact on the Environment

As summarized in the 2018 PA HMP, environmental impacts of drought include:

- Hydrologic effects – lower water levels in reservoirs, lakes, and ponds; reduced streamflow; loss of wetlands; estuarine impacts; groundwater depletion and land subsidence; effects on water quality, such as increases in salt concentration and water temperature
- Damage to animal species – lack of feed and drinking water; disease; loss of biodiversity; migration or concentration; and reduction and degradation of fish and wildlife habitat
- Reduced stream flow
- Loss of wetlands
- Increased groundwater depletion, land subsidence, and reduced groundwater recharge
- Water quality impacts, such as salinity, water temperature increases, pH changes, dissolved oxygen, or turbidity
- Loss of biodiversity

Future Growth and Development

Areas targeted for potential future growth and development within the next 5 to 10 years have been identified across the county (further discussed in Section 4.4 of this HMP). Any new development and all new residents will potentially be exposed to the drought hazard.

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by type, frequency, and intensity of weather events. Both globally and at the local level, climate change can alter prevalence and severity of weather extremes such as droughts. While predicting changes in drought events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating effects of future climate change on human health, society, and the environment (U.S. Environmental Protection Agency [EPA] 2006).

PADEP was directed by the Climate Change Act (Act 70 of 2008) to initiate a study of potential impacts of global climate change on the Commonwealth. The June 2009 Pennsylvania Climate Impact Assessment’s main findings indicated that Pennsylvania is very likely to undergo increased temperatures in the 21st century. Increases in temperature will likely lead to increased evapotranspiration, and thus an increase in soil-moisture-related droughts throughout late spring and early fall. Pennsylvania’s precipitation climate is projected to



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become more extreme in the future, with longer dry periods and greater intensity of precipitation. Most models project an increase in the maximum number of consecutive dry days in a year (Shortle et al. 2009).

Future improvements in modeling smaller-scale climatic processes can be expected and will lead to improved understanding of how the changing climate will alter temperature, precipitation, storm frequency, and intensity in Pennsylvania. Understanding this information can help provide better indications of future drought events (Shortle et al. 2009).



4.3.3 Earthquake

An earthquake is sudden movement of the Earth's surface caused by release of stress accumulated within or along the edge of the Earth's tectonic plates, a volcanic eruption, or a man-made explosion (Shedlock and Pakiser 1997). Most earthquakes occur at the boundaries where the Earth's tectonic plates meet (faults); less than 10 percent of earthquakes occur within plate interiors. As plates continue to move and plate boundaries change geologically over time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes, which are a response to stresses that originate at the edges of the plate or in the deeper crust (Shedlock and Pakiser 1997).

According to the U.S. Geological Survey (USGS) Earthquake Hazards Program, an earthquake hazard is any disruption associated with an earthquake that may affect residents' normal activities. This category includes surface faulting, ground motion (shaking), landslides, liquefaction, tectonic deformation, tsunamis, and seiches. Each of these terms is defined below:

- Surface faulting: Displacement that reaches the Earth's surface during a slip along a fault. This commonly occurs with shallow earthquakes—those with an epicenter of less than 20 kilometers (km).
- Ground motion (shaking): Movement of the Earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves generated by a sudden slip on a fault or sudden pressure at the explosive source, and the waves travel through the Earth and along its surface.
- Landslide: Movement of surface material down a slope.
- Liquefaction: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like the wet sand near the water at the beach. Earthquake shaking can cause this effect.
- Tectonic deformation: Change in the original shape of a material caused by stress and strain.
- Tsunami: A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major sub-marine slides, or exploding volcanic islands.
- Seiche: Sloshing of a closed body of water, such as a lake or bay, from earthquake shaking (USGS 2012).

Ground shaking is the primary cause of earthquake damage to man-made structures. Damage can be increased when soft soils amplify ground shaking. Soils influence damage in different ways. Soft soils can amplify the motion of earthquake waves, producing greater ground shaking and increasing stresses on built structures on the land surface. Loose, wet, sandy soils also can cause damage when they lose strength and flow as a fluid when shaken, causing foundations and underground structures to shift and break (Stanford 2003).

The National Earthquake Hazard Reduction Program (NEHRP) developed five soil classifications (A to E) distinguished by soil shear-wave velocity that alters severity of an earthquake; each classification is listed in Table 4.3.3-1. Class A soils (hard rock) reduce ground motion from an earthquake, and Class E soils (soft soils) amplify and magnify ground shaking and increase building damage and losses.



Table 4.3.3-1. NEHRP Soil Classifications

Soil Classification	Description
A	Hard rock
B	Rock
C	Very dense soil and soft rock
D	Stiff soils
E	Soft soils

Source: Federal Emergency Management Agency (FEMA) 2013

The following sections discuss location and extent, range of magnitude, previous occurrence, future occurrence, and vulnerability assessment associated with the earthquake hazard in Chester County.

4.3.3.1 Location and Extent

Focal depth and geographic position of the epicenter of an earthquake commonly determine its location. Focal depth of an earthquake is the depth from the Earth’s surface to the region where an earthquake’s energy originates (the focus or hypocenter). The epicenter of an earthquake is the point on the Earth’s surface directly above the hypocenter. Earthquakes usually occur without warning, and their effects can be felt in areas at great distances from the epicenter.

According to the Pennsylvania Bureau of Topographic and Geologic Survey, events that occur in the Commonwealth involve very small impact areas (less than 100 km in diameter). The area of Chester County is the most seismically active region in southeastern Pennsylvania (USGS 2014). Areas of Pennsylvania, including Chester County, may be subject to the effects of earthquakes with epicenters outside the Commonwealth.

Figure 4.3.3-1 shows relative seismic hazard zones in Pennsylvania, as determined by the USGS National Seismic Hazard Mapping Project. Earthquake hazards are highest in the southeastern region, which includes Chester County, and far northwestern region of the Commonwealth. (USGS 2018).



Figure 4.3.3-1. Pennsylvania Earthquake Hazard Zones



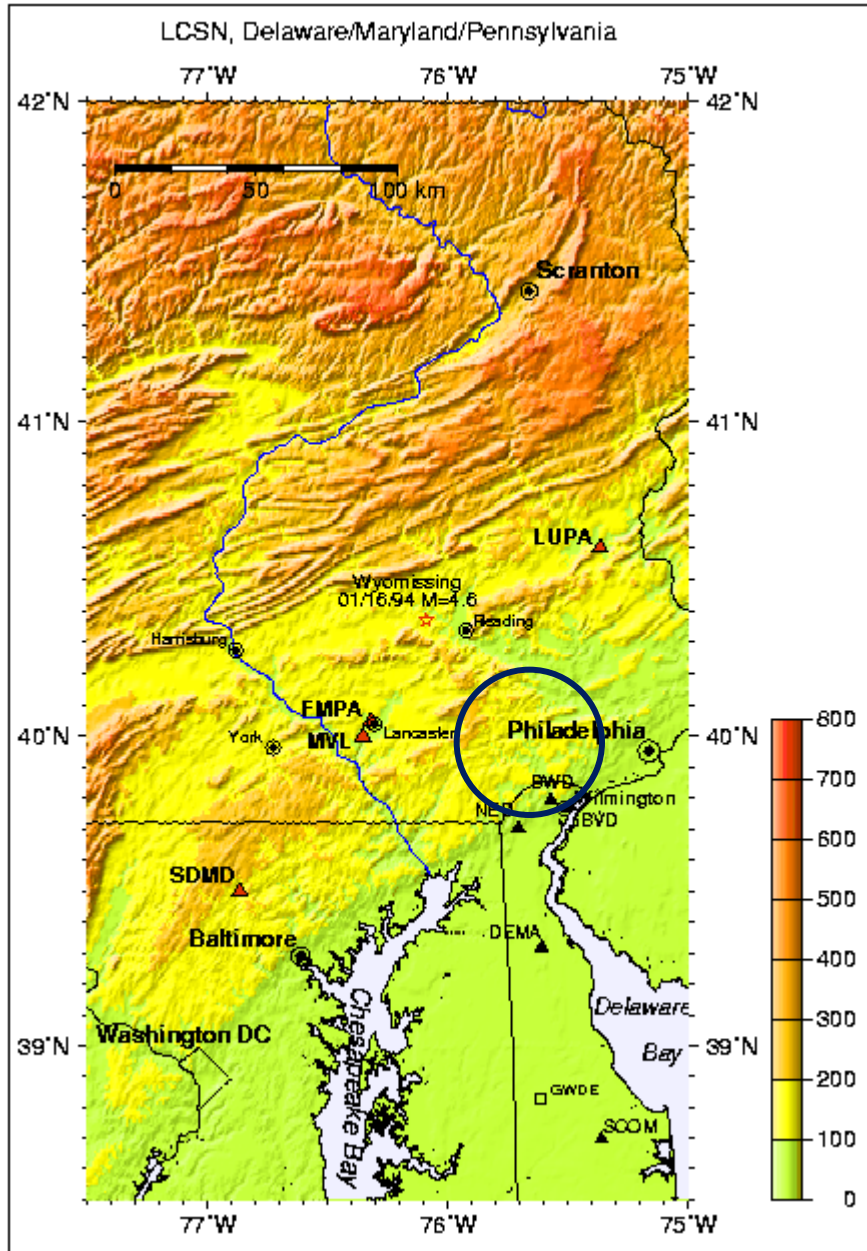
Source: USGS, 2018

Note: Chester County is within the blue oval on the map.

The Lamont-Doherty Cooperative Seismographic Network (LCSN) monitors earthquakes that occur primarily in the northeastern United States. Goals of the project are to compile a complete earthquake catalog for this region, assess earthquake hazards, and study causes of earthquakes in the region. LCSN operates 40 seismographic stations in the following seven states: Connecticut, Delaware, Maryland, New Jersey, New York, Pennsylvania, and Vermont. Figure 4.3.3-2 shows locations of seismographic stations in eastern Pennsylvania. The figure shows two stations, Franklin & Marshall College and Millersville University. The network is composed of broadband and short-period seismographic stations (LCSN 2012).



Figure 4.3.3-2. Lamont-Doherty Seismic Stations Locations in Eastern Pennsylvania



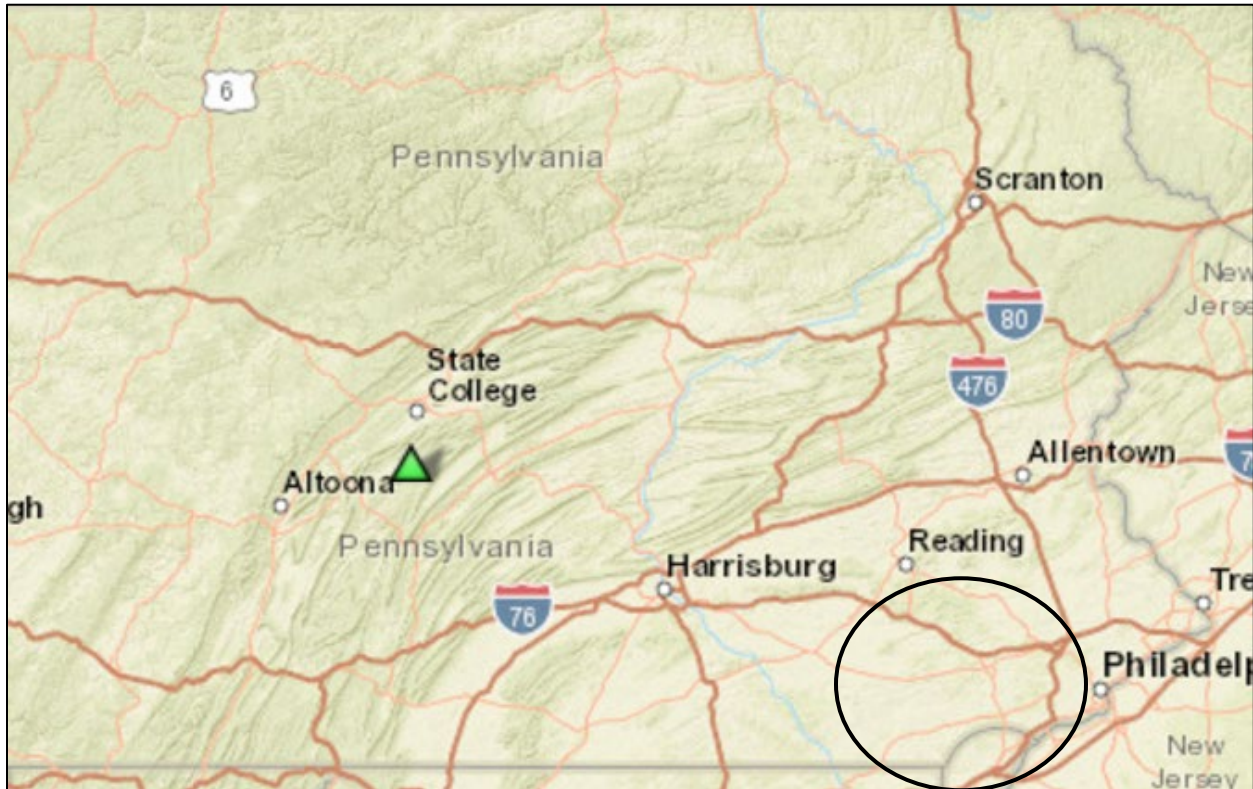
Source: LCSN 2012

Note: Chester County is within the oval on the map.

In addition to the Lamont-Doherty Seismic Stations, USGS operates a global network of seismic stations to monitor seismic activity. While no seismic stations are within Chester County, a nearby station is found in State College, Pennsylvania. Figure 4.3.3-3 shows its location.



Figure 4.3.3-3. USGS Seismic Stations



Source: USGS 2017

Note: Seismic station location is indicated by green triangle, and Chester County is within the black oval.

The USGS provides the website *Did You Feel It?* (<http://earthquake.usgs.gov/earthquakes/dyfi/>) for citizens to report earthquake experiences and to share information regarding the earthquake and its effects. The website is intended to gather citizens' experiences during an earthquake and incorporate the information into detailed maps to illustrate shaking intensity and damage assessments (USGS 2017).

Earthquakes above a magnitude 5.0 can cause damage near their epicenters, and larger-magnitude earthquakes can cause damage over larger, wider areas. A discussion of previous occurrences of earthquakes in Chester County appears in the Previous Occurrence section (Section 4.3.3.3) of this profile.

4.3.3.2 Range of Magnitude

Seismic waves are vibrations from earthquakes that travel through the Earth and are recorded on instruments called seismographs. The magnitude or extent of an earthquake is a given value of the earthquake size, or amplitude of the seismic waves, as measured by a seismograph. The Richter magnitude scale (Richter scale) was developed in 1932 as a mathematical device to compare sizes of earthquakes. The Richter scale is the most widely known scale that measures magnitude of earthquakes. It has no upper limit and is not used to express damage. An earthquake in a densely populated area that results in many deaths and considerable damage may have the same magnitude and shock in a remote area that did not undergo any damage. Table 4.3.3-2 lists Richter scale magnitudes and corresponding earthquake effects associated with each magnitude. Based on historical data of earthquakes with a recorded intensity, little damage is expected from earthquake events. However, since the worst earthquake recorded in Pennsylvania was a magnitude 5.2, a worst-case scenario for this hazard would be if an earthquake of similar magnitude occurred in Chester County or near the border in an adjacent county, causing mild damage in populated areas.



Table 4.3.3-2. Richter Scale Magnitudes

Richter Magnitude	Earthquake Effects
3.5 or less	Generally not felt, but recorded
3.5 to 5.4	Often felt, but rarely causes damage
Under 6.0	At most, slight damage to well-designed buildings; can cause major damage to poorly constructed buildings over small regions.
6.1 to 6.9	Can be destructive up to about 100 kilometers from epicenter.
7.0 to 7.9	Major earthquake; can cause serious damage over large areas.
8.0 or greater	Great earthquake; can cause serious damage in areas several hundred kilometers across.

Source: PEMA 2018

The intensity of an earthquake is based on observed effects of ground shaking on people, buildings, and natural features, and varies with location. The Modified Mercalli Intensity (MMI) scale expresses the intensity of an earthquake and is a subjective measure that describes the strength of a shock felt at a particular location. The MMI scale records intensity of an earthquake’s effects in a given locality according to a scale from I to XII. Descriptions of MMI scales appear in Table 4.3.3-3. Earthquakes that occur in Pennsylvania originate deep within the Earth’s crust and not on an active fault. No injury or severe damage from earthquake events has been reported in Chester County.

Table 4.3.3-3. Modified Mercalli Intensity Scale with Associated Impacts

Scale	Intensity	Description Of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	<4.2
II	Feeble	Felt only by a few persons at rest, especially on upper floors of buildings.	
III	Slight	Felt quite noticeably indoors, especially on upper floors. Most people don’t recognize it as an earthquake (i.e. a truck rumbling).	
IV	Moderate	Can be felt by people walking; dishes, windows, and doors are disturbed.	
V	Slightly Strong	Sleepers are awoken; unstable objects are overturned.	<4.8
VI	Strong	Trees sway; suspended objects swing; objects fall off shelves; damage is slight.	<5.4
VII	Very Strong	Damage is negligible in buildings of good design and construction, slight to moderate in well-built ordinary structures, and considerable in [poorly built or badly designed structures; some chimneys are broken.	<6.1
VIII	Destructive	Damage is slight in specially designed structures; considerable in ordinary, substantial buildings. Moving cars become uncontrollable; masonry fractures, poorly constructed buildings damaged.	<6.9
IX	Ruinous	Some houses collapse; ground cracks; pipes break open; damage is considerable in specially designed structures; buildings are shifted off foundations.	
X	Disastrous	Some well-built wooden structures are destroyed; most masonry and frame structures are destroyed along with foundations. Ground cracks profusely; liquefaction and landslides are widespread.	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes, and cables are destroyed.	<8.1
XII	Catastrophic	Total destruction; trees fall; lines of sight and level are distorted; ground rises and falls in waves; objects are thrown upward into the air.	>8.1

Source: Pennsylvania Hazard Mitigation Plan 2018

Seismic hazards are often expressed in terms of Peak Ground Acceleration (PGA) and Spectral Acceleration (SA). USGS defines PGA and SA as the following: “PGA is what is experienced by a particle on the ground. SA is approximately what is experienced by a building, as modeled by a particle mass on a massless vertical rod having the same natural period of vibration as the building” (USGS 2012). Both PGA and SA can be measured



in g (the acceleration caused by gravity) or expressed as a percent acceleration force of gravity (percent g). For example, at 100 percent g PGA (equivalent to 1.0 g) during an earthquake (an extremely strong ground motion), objects accelerate sideways at the same rate as when they drop from a ceiling. At 10 percent g PGA, ground acceleration is 10 percent that of gravity (New Jersey Office of Emergency Management [NJOEM] 2011). PGA and SA hazard maps provide insight into location-specific vulnerabilities (New York State Disaster Preparedness Commission [NYS DPC] 2011).

PGA is a common earthquake measurement that indicates three factors: (1) geographic area affected, (2) probability of an earthquake at each level of severity, and (3) strength of ground movement (severity) expressed in percent g. In other words, PGA expresses the severity of an earthquake and is a measure of how hard the earth shakes (or accelerates) in a given geographic area (NYS DPC 2011). Damage levels from an earthquake vary with intensity of ground shaking and with seismic capacity of structures, as noted in Table 4.3.3-4.

Table 4.3.3-4. Damage Levels Experienced in Earthquakes

Ground Motion Percentage	Explanation of Damages
1-2% g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10% g	Usually causes only slight damage, except in unusually vulnerable facilities.
10-20% g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20-50% g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50% g	May causes higher levels of damage in many buildings, even those designed to resist seismic forces.

Source: NJOEM 2011

Note: % g Peak Ground Acceleration

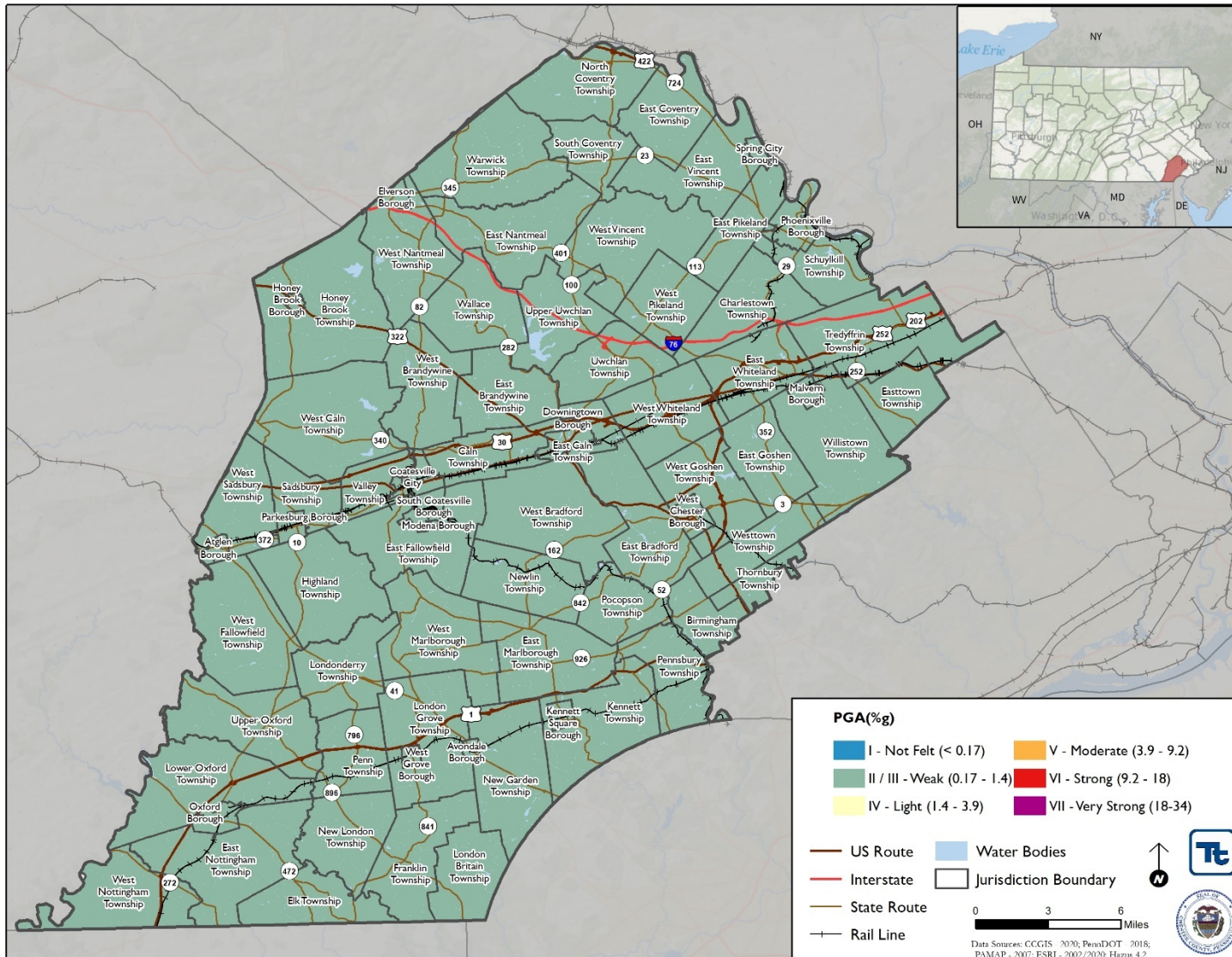
National maps of earthquake shaking hazards have been produced since 1948. These maps provide information essential for creating and updating seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land use planning applied in the United States. Scientists frequently revise these maps to reflect new information and knowledge. Buildings, bridges, highways, and utilities built to meet modern seismic design requirements are typically able to withstand earthquakes better than those designed earlier, with less damage and disruption. After thoroughly reviewing the studies, professional organizations of engineers update seismic-risk maps and seismic design requirements specified in building codes (Brown and others 2001).

To analyze the earthquake hazard in Chester County, a probabilistic assessment was conducted for the 500-year mean return period (MRP) in Hazards U.S.–Multi-Hazard (Hazardus) 4.2. A Hazardus analysis evaluates statistical likelihood that a specific event will occur and the consequences of that event. A 500-year MRP event is an earthquake with a 0.2-percent chance that the mapped ground motion levels (PGA) will be exceeded in any given year.

Figure 4.3.3-4 illustrates the geographic distribution of PGA (percent g) across Chester County for each event. Potential losses estimated by Hazardus for the MRP, and the associated PGAs, are discussed in the Vulnerability Assessment section (Section 4.3.3.5) of this profile.



Figure 4.3.3-4. Peak Ground Acceleration Modified Mercalli Scale in Chester County for a 500-Year MRP Earthquake Event



Source: HAZUS-MH 4.2
 Note: The Peak Ground Acceleration for the 500-year MRP is 1.2-1.3%g.

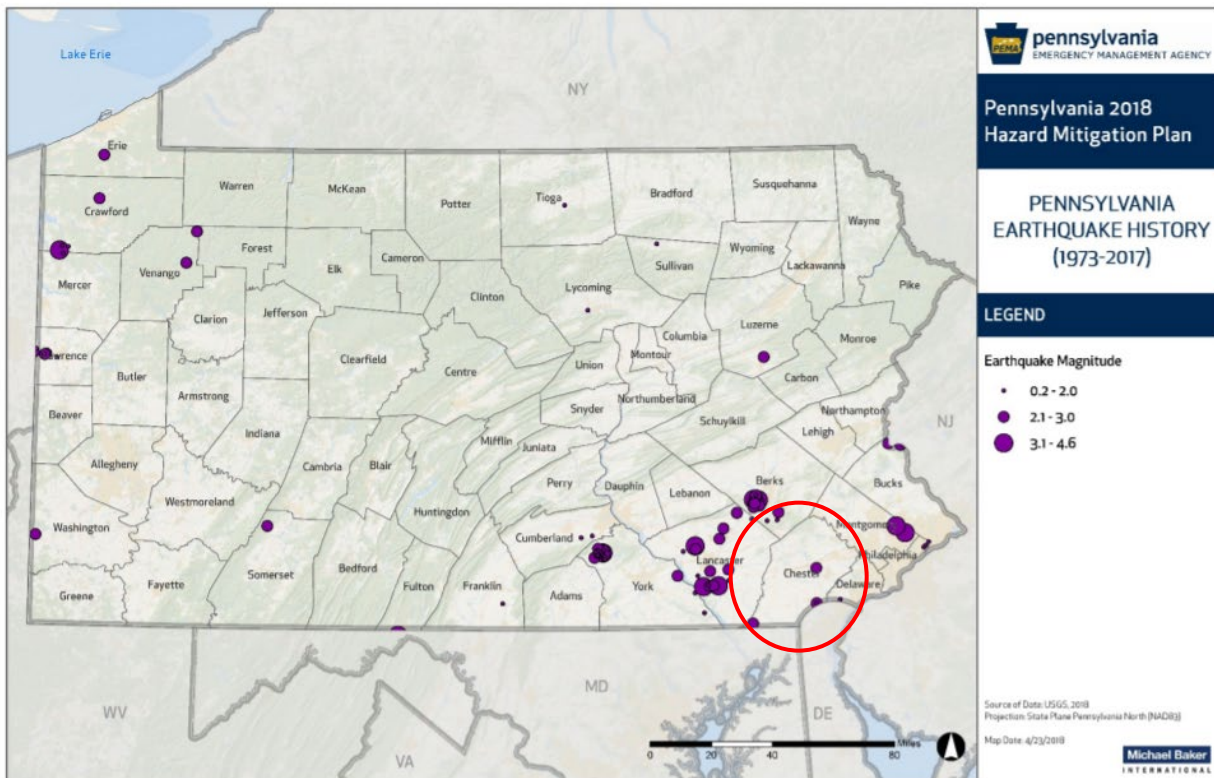




4.3.3.3 Past Occurrence

The historical record of earthquakes goes back approximately 200 years. In Pennsylvania, about 35 earthquakes have caused light damage since the Colonial period. Nearly one half of these damaging events had out of state epicenters (USGS 2018). Figure 4.3.3-5 is a map of earthquake epicenters in Pennsylvania from 1973 to 2018. No damage was reported in Chester County.

Figure 4.3.3-5. Earthquake Epicenters in Pennsylvania



Source: USGS 2018

Note: Chester County is within the red circle.

According to the USGS, between 1724 and June 9, 2020, there were five earthquake epicenters, one with a magnitude over 2.5 on the Richter scale, recorded in Chester County. The lowest magnitude was a 0.6 magnitude earthquake on July 25, 2019, and the largest magnitude was a 2.6 magnitude earthquake on January 25, 2015 (USGS 2020). According to the website, Chester County residents reported having felt 2.6 magnitude earthquake on January 25, 2015 (USGS 2020). PEMA’s Pennsylvania Disaster History list includes no significant earthquake events in Pennsylvania, and no Federal Emergency Management Agency (FEMA) major disaster (DR)/emergency declarations (EM) have occurred for significant earthquake events in Pennsylvania (FEMA 2020).

Historically, large earthquakes in eastern North America have occurred in three regions: (1) Mississippi Valley near the Town of New Madrid, Missouri; (2) St. Lawrence Valley region of Quebec, Canada; and (3) Charleston, South Carolina. In February 1925, one of the region’s largest earthquakes on record occurred (magnitude near 7.0) with its epicenter in a region of Quebec. If a similar-magnitude earthquake would occur in the western part of the Quebec region, some moderate damage might be expected in one or more counties of Pennsylvania’s northern tier. An earthquake with an estimated magnitude of about 7.5 occurred on August 31, 1886, in



Charleston, South Carolina. The earthquake was felt in most of Pennsylvania. More recently, a magnitude 5.8 earthquake with an epicenter in rural Louisa County, Virginia, was felt throughout Pennsylvania, triggering evacuations, emergency bridge and tunnel inspections, and minor damage to buildings. This shallow earthquake occurring along the Spotsylvania Fault was felt as far north as Ontario, Canada, and as far south as Alabama. (PEMA 2018).

Other earthquakes have occurred in east coast areas, including eastern Massachusetts, southeastern New York, and northern New Jersey. Moderate earthquakes occurred in southeastern New York and northern New Jersey and were felt in eastern Pennsylvania. If an earthquake of magnitude 6.0 or greater would occur in that area, damage would likely result in the easternmost counties of Pennsylvania, including Chester County.

4.3.3.4 Future Occurrence

Earthquakes cannot be predicted and could occur any time of the day or year. Major earthquakes are infrequent in the Commonwealth and in Chester County and may occur only once every few hundred years or longer, but the consequences of major earthquakes may potentially be very high. Based on the historic record, the future probability of damaging earthquakes impacting Chester County is low.

According to the USGS earthquake catalog, between 1950 and 2020, there have been five earthquakes with epicenters in Chester County. Based on available historical data, future occurrences of earthquake events can be considered *possible* as defined by the Risk Factor Methodology probability criteria (refer to Section 4.4 of this plan).

4.3.3.5 Vulnerability Assessment

A probabilistic assessment was conducted for the 500-year MRP through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates.

Impact on Life, Health, and Safety

Overall, the entire population of Chester County is exposed to the earthquake hazard event. According to the 2014-2018 ACS U.S. Census, Chester County had a population of 517,156 people. The impact of an earthquake on life, health, and safety would depend on the severity of the event. First responder safety may be at risk as well responding to earthquake hazard events. First responders may have difficulty traveling to earthquake incidents due to limited access to roads. Risks to public safety and loss of life from an earthquake in Chester County are minimal, with higher risk occurring in buildings as a result of damage to the structure, or people walking below building ornamentation and chimneys that may be shaken loose and fall as a result of the earthquake.

Populations considered most vulnerable are located in the built environment, particularly near unreinforced masonry construction. In addition, the vulnerable population includes the elderly (persons over the age of 65) and individuals living below the Census poverty threshold. These socially vulnerable populations are most susceptible, based on several factors, including their physical and financial ability to react or respond during a hazard, and locations and construction quality of their housing.

Residents may be displaced or require temporary to long-term sheltering as a result of the event. The number of people requiring shelter is generally less than the number displaced, as some displaced persons use hotels or stay with family or friends after a disaster event. Table 4.3.3-5 summarizes the estimated sheltering needs for Chester County.



Table 4.3.3-5. Summary of Estimated Sheltering Needs for Chester County

Scenario	Displaced Households	People Requiring Short-Term Shelter
500-Year Earthquake	19	11

Source: HAZUS-MH 4.2

Structural building damage correlates strongly to the number of injuries and casualties from an earthquake event (NYCEM 2003). Furthermore, different sectors of the community would be exposed to the hazard depending on time of day of occurrence. For example, Hazus considers that maximum residential occupancy occurs at 2:00 a.m.; educational, commercial, and industrial sectors maximum occupancy at 2:00 p.m.; and peak commute time at 5:00 p.m. Whether affected directly or indirectly, the entire population would have to contend with consequences of earthquakes to some degree. Business interruption could prevent people from working, road closures could isolate populations, and loss of functions of utilities could affect populations that suffered no direct damage from an event. Table 4.3.3-6 summarizes estimated number of injuries, hospitalizations, and casualties as a result of the 500-year MRP event.

Table 4.3.3-6. Estimated Number of Injuries, Hospitalizations, and Casualties from the 500-Year MRP Earthquake Event

Level of Severity	Time of Day		
	2:00 AM	2:00 PM	5:00 PM
Injuries	20	147	100
Hospitalization	3	23	15
Casualties	0	4	2

Source: HAZUS-MH 4.2

Impact on General Building Stock

For this HMP update, a Hazus probabilistic model was run to estimate annualized dollar losses for Chester County. Annualized losses are useful for mitigation planning because they provide a baseline upon which to (1) compare the risk of one hazard across multiple jurisdictions and (2) compare the degree of risk of all hazards for each participating jurisdiction. Annualized loss does not, however, predict what losses will occur in any particular year.

According to NYCEM, where earthquake risks and mitigation were evaluated in the New York, New Jersey, and Connecticut region, most damage and loss caused by an earthquake would directly or indirectly result from ground shaking (NYCEM 2003). NYCEM found a strong correlation between PGA and damage a building might undergo. The Hazus model is based on the best available earthquake science and aligns with these statements. Hazus methodology and model were used to analyze the earthquake hazard for the general building stock within Chester County. Figure 4.3.3-5 earlier in this profile illustrates the geographic distribution of PGA (g) across the county for the 500-year MRP event.

In addition, according to NYCEM (NYCEM 2003), a building’s construction determines how well it can withstand the force of an earthquake. The NYCEM report indicates that unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward, whereas steel and wood buildings absorb more of the earthquake’s energy. Additional attributes that affect a building’s capability to withstand an earthquake’s force include its age, number of stories, and quality of construction. Hazus considers



building construction and age of buildings in its analysis. Default building ages and building types already incorporated into the inventory were used because the default general building stock was used for this Hazus analysis.

Potential building damage was evaluated by Hazus the following damage categories: none, slight, moderate, extensive, and complete. Table 4.3.3-7 provides definitions of these categories of damage for a light wood-framed building; definitions for other building types are included in the Hazus technical manual documentation.

Table 4.3.3-7. Example of Structural Damage State Definitions for a Light Wood-Framed Building

Damage Category	Description
Slight	Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse because of the crippled wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: FEMA 2015

Table 4.3.3-8 summarizes the damage estimated for the 500-year MRP earthquake event. Damage loss estimates include structural and non-structural damage to the building and loss of contents. Residential homes have the greatest number of buildings that would experience complete destruction (eight buildings).

Table 4.3.3-8. Estimated Buildings Damaged by General Occupancy for 500-year MRP Earthquake Event

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	EQ 500-Year	
			Building Count	Percent Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	200,398	None	196,503	98.1%
		Minor	3,048	1.5%
		Moderate	762	0.4%
		Severe	77	<0.1%
		Complete Destruction	8	<0.1%
Commercial Buildings	10,439	None	9,555	91.5%
		Minor	599	5.7%
		Moderate	244	2.3%
		Severe	36	0.3%
		Complete Destruction	4	<0.1%
Industrial Buildings	1,061	None	971	91.5%
		Minor	61	5.7%
		Moderate	24	2.3%
		Severe	5	0.5%
		Complete Destruction	0	0.0%



Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	EQ 500-Year	
			Building Count	Percent Buildings in Occupancy Class
Government, Religion, Agricultural, and Education Buildings	20,861	None	19,297	92.5%
		Minor	1,068	5.1%
		Moderate	428	2.1%
		Severe	63	0.3%
		Complete Destruction	7	<0.1%

Source: HAZUS-MH 4.2; Chester County GIS 2020

Table 4.3.3-9 presents the estimated replacement cost values for buildings and contents damaged by the 500-year MRP earthquake event. Damage loss estimates include structural and non-structural damage to buildings and loss of contents. An estimated \$169 million in damage would occur to buildings in the county during a 500-year earthquake event. This considers structural damage, non-structural damage, and loss of contents, representing less than 0.1-percent of total replacement value for general building stock in Chester County (194.7 billion).



Table 4.3.3-9. Estimated Building Value (Building and Contents) Damaged by the Annualized, 500-Year MRP Earthquake Event

Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damage for All Other Occupancies
Atglen (B)	\$300,171,233	\$157,023	0.1%	\$23,861	\$71,180	\$61,982
Avondale (B)	\$275,491,131	\$79,110	<0.1%	\$20,198	\$14,092	\$44,819
Birmingham (Twp.)	\$1,521,752,088	\$937,084	0.1%	\$491,779	\$270,821	\$174,484
Caln (Twp.)	\$4,389,258,174	\$3,727,893	0.1%	\$1,144,080	\$1,315,997	\$1,267,815
Charlestown (Twp.)	\$2,334,124,537	\$1,894,707	0.1%	\$649,533	\$555,801	\$689,373
Coatesville (C)	\$2,658,702,748	\$2,847,928	0.1%	\$1,275,325	\$715,571	\$857,032
Downingtown (B)	\$2,678,308,815	\$2,883,436	0.1%	\$705,674	\$858,075	\$1,319,687
East Bradford (Twp.)	\$3,166,888,223	\$2,073,045	0.1%	\$949,806	\$331,744	\$791,496
East Brandywine (Twp.)	\$2,499,920,165	\$1,350,251	0.1%	\$801,497	\$195,036	\$353,719
East Caln (Twp.)	\$1,864,909,402	\$1,610,339	0.1%	\$428,289	\$870,817	\$311,233
East Coventry (Twp.)	\$2,200,926,728	\$1,689,261	0.1%	\$712,855	\$445,440	\$530,966
East Fallowfield (Twp.)	\$1,984,687,476	\$1,194,295	0.1%	\$625,226	\$114,454	\$454,615
East Goshen (Twp.)	\$5,680,635,001	\$3,964,282	0.1%	\$1,971,251	\$1,426,724	\$566,307
East Marlborough (Twp.)	\$3,646,563,821	\$3,029,958	0.1%	\$847,486	\$874,913	\$1,307,558
East Nantmeal (Twp.)	\$1,131,945,456	\$1,086,970	0.1%	\$224,337	\$163,093	\$699,539
East Nottingham (Twp.)	\$3,185,167,607	\$2,509,421	0.1%	\$577,458	\$265,544	\$1,666,419
East Pikeland (Twp.)	\$2,751,413,608	\$2,055,172	0.1%	\$875,601	\$604,478	\$575,093
East Vincent (Twp.)	\$2,764,012,516	\$2,382,521	0.1%	\$752,148	\$490,236	\$1,140,137
East Whiteland (Twp.)	\$8,143,686,632	\$9,195,216	0.1%	\$1,263,222	\$6,293,512	\$1,638,482
Easttown (Twp.)	\$3,998,338,009	\$3,360,045	0.1%	\$1,954,479	\$734,105	\$671,461
Elk (Twp.)	\$754,193,647	\$598,913	0.1%	\$153,247	\$13,530	\$432,136
Elverson (B)	\$516,332,051	\$105,652	<0.1%	\$26,614	\$13,830	\$65,208
Franklin (Twp.)	\$1,537,535,450	\$900,641	0.1%	\$396,216	\$130,143	\$374,282



Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damage for All Other Occupancies
Highland (Twp.)	\$1,067,555,265	\$1,231,625	0.1%	\$131,179	\$22,979	\$1,077,467
Honey Brook (B)	\$446,825,932	\$337,943	0.1%	\$151,441	\$124,766	\$61,736
Honey Brook (Twp.)	\$3,389,705,910	\$3,311,274	0.1%	\$732,027	\$571,238	\$2,008,008
Kennett (Twp.)	\$4,134,894,338	\$3,374,876	0.1%	\$1,092,120	\$554,833	\$1,727,923
Kennett Square (B)	\$1,600,982,472	\$1,490,784	0.1%	\$468,808	\$592,192	\$429,783
London Britain (Twp.)	\$1,064,040,035	\$500,748	0.0%	\$324,059	\$23,138	\$153,551
London Grove (Twp.)	\$3,148,102,405	\$2,756,370	0.1%	\$703,754	\$491,005	\$1,561,611
Londonderry (Twp.)	\$1,034,199,367	\$827,787	0.1%	\$222,050	\$64,870	\$540,867
Lower Oxford (Twp.)	\$2,325,017,464	\$2,312,409	0.1%	\$290,731	\$376,826	\$1,644,852
Malvern (B)	\$1,256,307,741	\$1,137,439	0.1%	\$446,157	\$340,020	\$351,262
Modena (B)	\$143,886,459	\$135,352	0.1%	\$31,672	\$34,925	\$68,755
New Garden (Twp.)	\$5,996,313,471	\$5,806,198	0.1%	\$971,500	\$1,269,834	\$3,564,863
New London (Twp.)	\$1,850,994,293	\$1,093,600	0.1%	\$409,998	\$122,796	\$560,807
Newlin (Twp.)	\$767,919,221	\$768,402	0.1%	\$107,214	\$59,735	\$601,452
North Coventry (Twp.)	\$2,814,129,243	\$2,506,378	0.1%	\$1,041,078	\$851,089	\$614,211
Oxford (B)	\$1,620,222,123	\$1,420,366	0.1%	\$415,611	\$623,432	\$381,323
Parkesburg (B)	\$791,790,495	\$592,487	0.1%	\$259,208	\$224,251	\$109,028
Penn (Twp.)	\$3,335,917,017	\$3,316,872	0.1%	\$438,134	\$595,327	\$2,283,412
Pennsbury (Twp.)	\$1,741,030,601	\$1,242,747	0.1%	\$617,061	\$210,538	\$415,148
Phoenixville (B)	\$4,404,373,172	\$4,058,240	0.1%	\$1,820,378	\$1,369,488	\$868,374
Pocopson (Twp.)	\$1,616,048,060	\$1,278,544	0.1%	\$466,379	\$322,043	\$490,122
Sadsbury (Twp.)	\$1,514,078,865	\$1,340,241	0.1%	\$334,122	\$675,277	\$330,842
Schuylkill (Twp.)	\$3,296,773,180	\$2,820,064	0.1%	\$1,193,500	\$542,815	\$1,083,750
South Coatesville (B)	\$656,482,254	\$673,202	0.1%	\$157,527	\$173,708	\$341,967
South Coventry (Twp.)	\$1,175,837,157	\$1,077,189	0.1%	\$305,511	\$155,088	\$616,590



Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damage for All Other Occupancies
Spring City (B)	\$913,935,869	\$949,329	0.1%	\$419,780	\$284,512	\$245,038
Thornbury (Twp.)	\$1,249,939,720	\$958,669	0.1%	\$358,106	\$168,778	\$431,784
Tredyffrin (Twp.)	\$13,427,976,905	\$13,637,415	0.1%	\$4,407,822	\$7,262,128	\$1,967,464
Upper Oxford (Twp.)	\$1,327,197,078	\$1,200,158	0.1%	\$226,145	\$84,901	\$889,113
Upper Uwchlan (Twp.)	\$3,757,709,779	\$2,371,335	0.1%	\$964,724	\$1,080,665	\$325,946
Uwchlan (Twp.)	\$7,025,589,763	\$5,870,972	0.1%	\$1,843,192	\$2,882,084	\$1,145,696
Valley (Twp.)	\$2,597,377,442	\$2,112,117	0.1%	\$622,218	\$547,879	\$942,019
Wallace (Twp.)	\$1,322,743,721	\$883,291	0.1%	\$409,657	\$31,592	\$442,041
Warwick (Twp.)	\$1,133,542,100	\$945,362	0.1%	\$328,341	\$106,902	\$510,120
West Bradford (Twp.)	\$3,995,074,181	\$2,631,607	0.1%	\$1,285,888	\$834,576	\$511,143
West Brandywine (Twp.)	\$2,231,906,820	\$1,557,022	0.1%	\$632,055	\$202,212	\$722,756
West Caln (Twp.)	\$2,765,167,902	\$2,102,874	0.1%	\$909,946	\$301,699	\$891,230
West Chester (B)	\$5,374,643,016	\$6,106,993	0.1%	\$1,856,278	\$2,188,809	\$2,061,906
West Fallowfield (Twp.)	\$1,743,066,295	\$1,825,319	0.1%	\$264,939	\$334,320	\$1,226,060
West Goshen (Twp.)	\$9,444,801,871	\$8,893,632	0.1%	\$2,299,192	\$4,426,808	\$2,167,633
West Grove (B)	\$499,625,186	\$348,480	0.1%	\$188,470	\$103,922	\$56,088
West Marlborough (Twp.)	\$997,081,475	\$1,082,722	0.1%	\$151,071	\$84,170	\$847,481
West Nantmeal (Twp.)	\$1,139,858,316	\$1,390,836	0.1%	\$350,358	\$182,057	\$858,421
West Nottingham (Twp.)	\$1,196,217,005	\$1,079,928	0.1%	\$251,153	\$200,534	\$628,240
West Pikeland (Twp.)	\$1,506,034,830	\$946,157	0.1%	\$523,729	\$64,207	\$358,220
West Sadsbury (Twp.)	\$1,651,357,888	\$1,884,889	0.1%	\$286,428	\$854,439	\$744,021
West Vincent (Twp.)	\$2,587,356,437	\$1,695,008	0.1%	\$745,739	\$210,353	\$738,916
West Whiteland (Twp.)	\$7,660,221,171	\$6,884,575	0.1%	\$1,616,926	\$3,942,591	\$1,325,059
Westtown (Twp.)	\$3,282,102,771	\$2,628,273	0.1%	\$1,123,802	\$427,516	\$1,076,955
Willistown (Twp.)	\$4,727,817,226	\$3,929,289	0.1%	\$1,569,464	\$947,410	\$1,412,415



Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damage for All Other Occupancies
Chester County (Total)	\$194,736,735,824	\$168,960,547	0.1%	\$53,636,823	\$54,916,412	\$60,407,312

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: Total amount is sum of damage for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government).

B – Borough; C – City; Twp. – Township; % - Percent



Impact on Critical Facilities

After consideration of general building stock exposed to and damaged by each earthquake event, critical facilities were evaluated. All critical facilities (essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities, and user-defined facilities) in Chester County are considered exposed and vulnerable to the earthquake hazard. The Critical Facilities subsection of this HMP in Section 4.4 (Hazard Vulnerability Summary) discusses the inventory of critical facilities in Chester County. Additionally, first responders may have limited access to critical facilities due to damaged infrastructure and electrical/utility fires may increase with disruptions to lines.

Hazus estimates the probability that critical facilities may sustain damage as a result of the 500-year MRP earthquake event. Additionally, Hazus estimates percent functionality of each facility days after the event. Table 4.3.3-10 (500-year MRP earthquake event) lists percent probabilities that critical facilities and utilities would sustain damage within the damage categories (column headings), and lists percent functionalities after different numbers of days following those events (column headings).

Table 4.3.3-10. Estimated Damage to and Loss of Functionality of Critical Facilities and Utilities in Chester County for the 500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
EOC	99.2	0.8	0.1	0.0	0.0	99.2	99.9	99.9	99.9
Medical	99.2	0.9	0.0	0.0	0.0	99.1	99.9	99.9	99.9
Police	97.4-97.6	1.5	0.9	0.2	0.0	97.3-97.5	98.9	99.8	99.9
Fire	99.8	0.0	0.0	0.0	0.0	99.8	99.9	99.9	99.9
Schools	99.9	0.0	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Utilities									
Potable Water	99.9	0.1	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Wastewater	99.9	0.1	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Oil System	99.9	0.1	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Electric Power	99.8	0.1	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Communication	95.4-99.2	0.8-3.1	.02-1.4	0.1	0.0	99.6	99.9	99.9	99.9
Natural Gas	99.9	0.1	0.0	0.0	0.0	98.6	99.8	99.9	99.9
Transportation									
Bus Facilities	99.1	0.9	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Highway Bridge	100.0	0.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0
Airport Facility	100.0	0.0	0.0	0.0	0.0	99.9	99.9	99.9	99.9
Railway Facility	99.9	0.9	0.0	0.0	0.0	99.9	99.9	99.9	99.9

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: EOC - Emergency Operations Center

Impact on Economy

Earthquakes also impact the economy, including loss of business function, damage to inventory (buildings, transportation, and utility systems), relocation costs, wage loss, and rental loss from building repair and



replacement. Hazus estimates building-related economic losses, including income losses (wage, rental, relocation, and capital-related losses) and capital stock losses (structural, non-structural, content, and inventory losses). Economic losses estimated by Hazus are summarized in Table 4.3.3-11.

Table 4.3.3-11 Building-Related Economic Losses from the 500-Year MRP Earthquake Event

Mean Return Period (MRP)	Inventory Loss	Relocation Loss	Building and Content Losses	Wages Losses	Rental Losses	Capital-Related Loss
500-year MRP	\$575,700	\$31,605,400	\$69,938,200	\$17,831,100	\$13,805,900	\$19,046,100

Source: HAZUS-MH v4.2.; Chester County GIS 2020

Although the Hazus model did not compute damage estimates for individual roadway segments and railroad tracks, assumedly these features would undergo damage, resulting in interruptions of regional transportation and of distribution of materials. Losses to the community that would result from damage to lifelines could exceed costs of repair (FEMA 2012). Earthquake events can significantly affect road bridges, many of which provide the only access to certain neighborhoods. Because softer soils generally follow floodplain boundaries, bridges that cross watercourses should be considered vulnerable. Other key factors in degree of vulnerability include the age and infrastructure of a facility, which correlate with standards in place at time of construction.

Hazus estimates volume of debris that may be generated as a result of an earthquake event to enable the study region to prepare for and rapidly and efficiently manage debris removal and disposal. Debris estimates were divided into two categories: (1) reinforced concrete and steel that require special equipment to break up before transport can occur, and (2) brick, wood, and other debris that can be loaded directly onto trucks by use of bulldozers (Hazus Earthquake User’s Manual).

Table 4.3.3-12 summarizes the estimated debris generated by the 500-year MRP event. Hazus estimated the generation of over 142,000 tons of total debris during the 500-year MRP event. The Township of Tredyffrin would generate the greatest amount of debris at 12,276 tons.

Table 4.3.3-12 Estimated Debris Generated by 500-year MRP Earthquake Event

Jurisdiction	500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)
Atglen (B)	126	23
Avondale (B)	56	10
Birmingham (Twp.)	575	101
Caln (Twp.)	2,639	489
Charlestown (Twp.)	1,260	233
Coatesville (C)	2,391	448
Downingtown (B)	2,333	436
East Bradford (Twp.)	1,163	213
East Brandywine (Twp.)	638	115
East Caln (Twp.)	1,181	221
East Coventry (Twp.)	1,078	204
East Fallowfield (Twp.)	624	111
East Goshen (Twp.)	2,506	459
East Marlborough (Twp.)	2,046	365
East Nantmeal (Twp.)	738	137



Jurisdiction	500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)
East Nottingham (Twp.)	1,723	310
East Pikeland (Twp.)	1,450	268
East Vincent (Twp.)	1,663	311
East Whiteland (Twp.)	7,262	1,366
Easttown (Twp.)	2,335	431
Elk (Twp.)	405	74
Elverson (B)	75	14
Franklin (Twp.)	532	94
Highland (Twp.)	907	164
Honey Brook (B)	215	41
Honey Brook (Twp.)	2,361	455
Kennett (Twp.)	2,400	426
Kennett Square (B)	1,138	203
London Britain (Twp.)	252	43
London Grove (Twp.)	1,935	348
Londonderry (Twp.)	536	97
Lower Oxford (Twp.)	1,876	337
Malvern (B)	808	151
Modena (B)	137	25
New Garden (Twp.)	4,473	805
New London (Twp.)	632	111
Newlin (Twp.)	559	100
North Coventry (Twp.)	1,803	334
Oxford (B)	1,134	203
Parkesburg (B)	403	72
Penn (Twp.)	2,519	457
Pennsbury (Twp.)	784	139
Phoenixville (B)	3,006	558
Pocopson (Twp.)	882	157
Sadsbury (Twp.)	1,012	183
Schuylkill (Twp.)	1,907	356
South Coatesville (B)	679	123
South Coventry (Twp.)	707	131
Spring City (B)	793	148
Thornbury (Twp.)	595	105
Tredyffrin (Twp.)	10,352	1,924
Upper Oxford (Twp.)	853	153
Upper Uwchlan (Twp.)	1,346	245
Uwchlan (Twp.)	4,061	746
Valley (Twp.)	1,725	324



Jurisdiction	500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)
Wallace (Twp.)	481	88
Warwick (Twp.)	631	117
West Bradford (Twp.)	1,512	283
West Brandywine (Twp.)	883	168
West Caln (Twp.)	1,256	247
West Chester (B)	4,721	887
West Fallowfield (Twp.)	1,383	250
West Goshen (Twp.)	6,752	1,259
West Grove (B)	253	45
West Marlborough (Twp.)	787	141
West Nantmeal (Twp.)	982	185
West Nottingham (Twp.)	861	163
West Pikeland (Twp.)	504	92
West Sadsbury (Twp.)	1,518	274
West Vincent (Twp.)	935	171
West Whiteland (Twp.)	5,060	939
Westtown (Twp.)	1,645	304
Willistown (Twp.)	2,522	464
Chester County (Total)	120,276	22,175

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: B - Borough; C - City; Twp. - Township

Impact on the Environment

Earthquakes can lead to numerous, widespread, and devastating environmental impacts. These impacts may include but are not limited to:

- Induced flooding or landslides
- Poor water quality
- Damage to vegetation
- Breakage in sewage, wastewater, or toxic material containment

Secondary impacts can include train derailments, roadway damage, spillage of hazardous materials (HazMat), and utility interruption.

Cascading Impacts to Other Hazards

The Global Geoengineering Research Group in USGS has been investigating the relationship earthquakes have with ground deformation, and ground failure (USGS 2019). As mentioned in earlier sections, soft and loose soils are more susceptible to earthquake events. Ground failure can become exacerbated from earthquake events, causing landslides. Areas of steep slopes are at greater risk of ground failure and potential erosion during earthquakes (USGS 2019).



Future Changes that May Impact Vulnerability

Understanding future changes that affect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions, as relevant and appropriate, including the impacts of climate change

Future Growth and Development

Human exposure and vulnerability to earthquake impacts in newly developed areas are anticipated to be similar to those currently within the county. Building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older, existing construction that may have been built to lower construction standards. Any areas of growth could also be impacted by the flood hazard if within identified hazard areas. The tables and hazard maps included in the jurisdictional annexes contain additional information regarding the specific areas of development that would increase county vulnerability to dam inundation areas.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicates that Chester County's population will continue to increase into 2040, with a total population of approximately 603,068 persons (The Center of Rural Pennsylvania 2013). As more persons move into earthquake susceptible areas, an increased amount of the population will be vulnerable to the effects of earthquakes.

Effect of Climate Change on Vulnerability

Impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the Earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. National Aeronautics and Space Administration (NASA) and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes (NASA 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could undergo liquefaction during seismic activity as a result of the increased saturation. Dams storing increased volumes of water, as a result of changes in the hydrograph, could fail during seismic events. No current models are available to estimate these impacts.

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also established using RS Means 2019 building valuations that estimated replacement cost value for each building in the inventory. Additionally, a critical facility dataset was provided from the county. A Level 2 Hazus earthquake analysis was conducted for Chester County.

Additional data is needed to further refine and enhance the county's vulnerability assessment, which includes identifications of unreinforced masonry critical facilities and privately owned buildings (i.e., residences) via



local knowledge and/or pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response/recovery efforts for these properties can be established.

Ground shaking is the primary cause of earthquake damage to man-made structures, and soft soils amplify ground shaking. One contributor to site amplification is velocity at which rock or soil transmits shear waves (S-waves). The NEHRP developed five soil classifications defined by their shear-wave velocity that alter severity of an earthquake. These soil classifications range from A to E, whereby A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses. When this soil information becomes available, it may be incorporated into Hazus to further refine the county's vulnerability assessment.



4.3.4 Environmental Hazards – Hazardous Materials Releases

This section provides a profile and vulnerability assessment of the environmental hazards – hazardous materials releases profile for the Chester County Hazard Mitigation Plan (HMP).

The U.S. Department of Transportation (DOT) categorizes hazardous materials (hazmat) into the following nine classes based on chemical characteristics producing the risk:

- Class 1: Explosives
- Class 2: Gases
- Class 3: Flammable liquids
- Class 4: Flammable solids
- Class 5: Oxidizers and organic pesticides
- Class 6: Poisons and etiologic materials
- Class 7: Radioactive materials
- Class 8: Corrosives
- Class 9: Miscellaneous

Chester County currently has 18 hazardous materials waste Superfund sites that utilize, ship, or house chemicals considered hazardous. 11 of those 18 are listed on the National Priorities List for Superfund Cleanup. A total of 72 Superfund Amendments and Reauthorization Act (SARA) Title III planning facilities are located in Chester County. A total of 437 chemicals are contained at 166 other reporting facilities in the county (Chester County 2015).

Product release into the local environment can derive from a fixed facility or occur at any location along a route of travel, and may be the result of carelessness, technical failure, external incidents, or an intentional act against the facility or container. Volatility of products stored or transported, along with potential impact on a local community, may increase the risk of intentional acts against a facility or transport vehicle. Release of certain products considered “hazardous materials” can immediately and adversely impact the general population, ranging from the inconvenience of evacuations to personal injury and even death. Moreover, any release can compromise the local environment through contamination of soil, groundwater, or local flora and fauna.

4.3.4.1 Location and Extent

Based on past occurrences, hazmat releases within Chester County have been accidental and have not been considered terrorist or criminal acts. While past occurrences have not been deemed intentional, an intentional release of any of these products in large quantity would pose a threat to the local population, economy, and environment resulting in lost revenue, injuries, and deaths.

Chester County is home 3,662 miles of roadways, including 26 miles of turnpike, 1,160 miles of state and federal highways, and 2,476 miles of secondary and tertiary roads. With nearly 4,500 miles of roadways linking more-populated areas with rural communities, the grid work of roadways facilitates free movement of hazmats throughout the region. The county’s large agricultural area includes 1,646 farms, which increases its vulnerability to hazmat accidents.

While permitted, identified hazardous substance travel routes are not maintained by the county or regional planning entities. The primary roadways in Chester County are listed as follows (and illustrated on Figure 4.3.4-1):

- Pennsylvania Turnpike (I-76)
- U.S. Highway 1 (US-1)
- U.S. Highway 30 (US-30)
- U.S. Highway 202 (US-202)
- U.S. Highway 322 (US-322)



Section 4.3.4: Risk Assessment – Environmental Hazards – Hazardous Materials Releases

- U.S. Highway 422 (US-422)
- State Highway 3 (PA-3)
- State Highway 10 (PA-10)
- State Highway 272 (PA-272)
- State Highway 282 (PA-282)
- State Highway 372 (PA-372)
- State Highway 401 (PA-401)

Rail lines that transport hazardous materials are shown in Figure 4.3.4-1. In addition to the major routes of transportation, each fixed facility identified within Chester County poses a potential threat to the surrounding community. The U.S. Environmental Protection Agency (EPA) tracks management of over 650 toxic chemicals that pose a threat to human health and the environment through the Toxic Release Inventory (TRI). Facilities in certain industries that use or house these chemicals in amounts exceeding specified levels must submit annual reports on how each chemical is managed through recycling, energy recovery, treatment, and releases to the environment. A “release” of a chemical means emission to the air or water, or placement in some type of land disposal. EPA publishes all TRI data in a publicly accessible database in Envirofacts. In 2018, 29 TRI facilities in Chester County reported to EPA (EPA 2020). Figure 4.3.4-2 shows the SARA sites with buffers in the county.

Figure 4.3.4-1. Major Transportation Routes and Railways with Buffer in Chester County, Pennsylvania

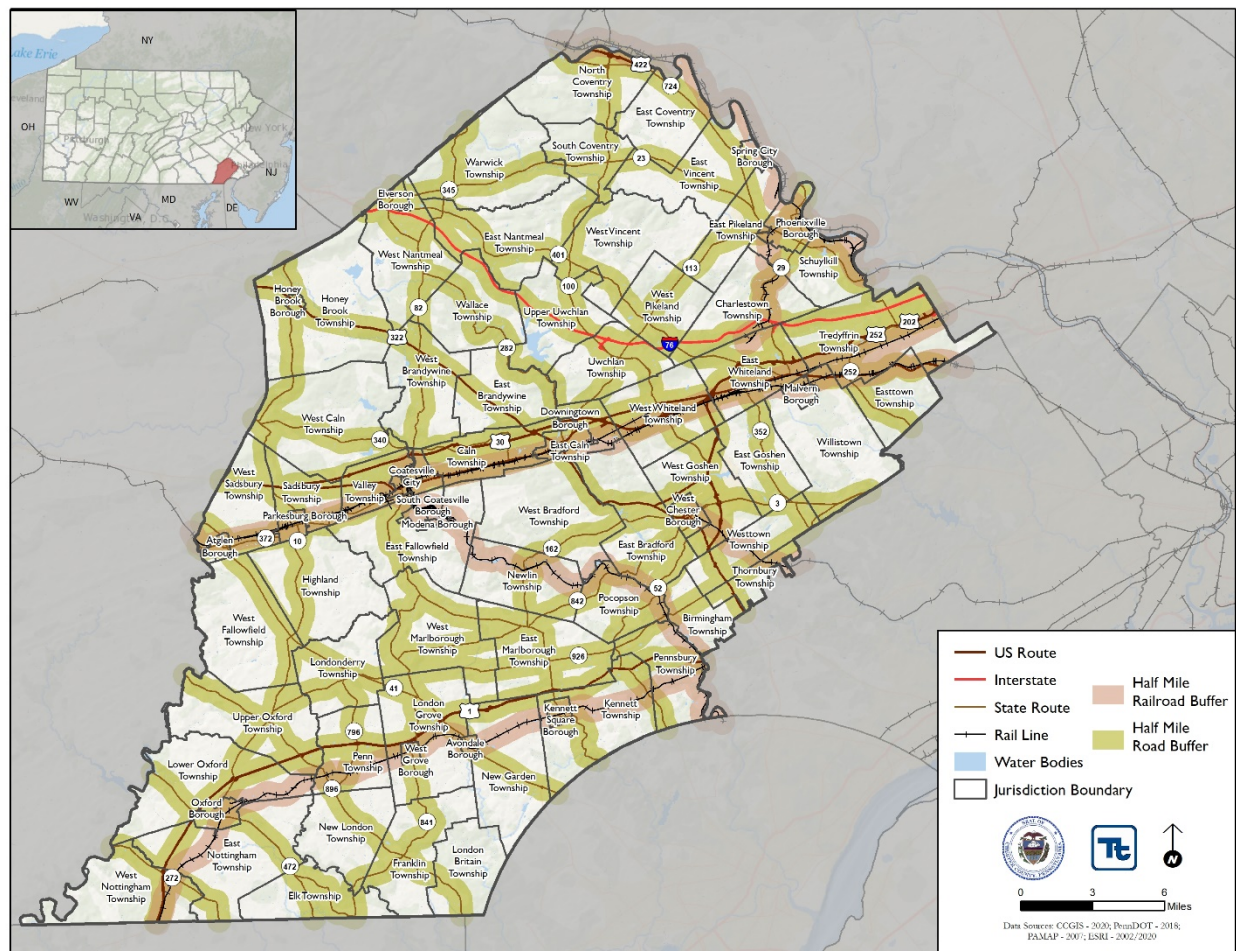
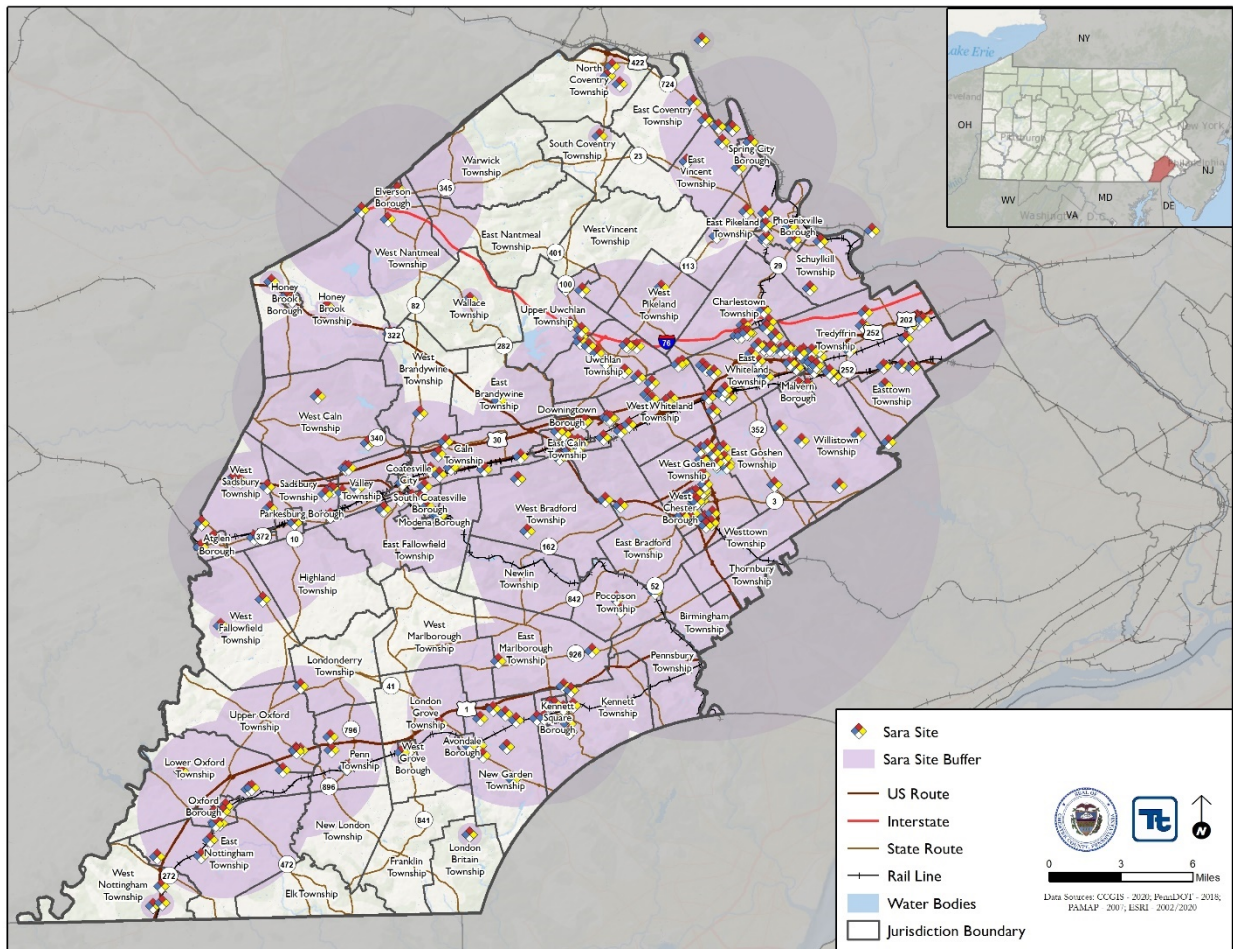




Figure 4.3.4-2. SARA Sites with Buffer in Chester County, Pennsylvania



4.3.4.2 Range of Magnitude

Environmental hazard incidents within Chester County could range from minor petroleum spills to large, facility-based incidents that could lead to loss of life and damage to property, environment, and economy. Severity of an incident varies with type of material released, and distance and related response time for emergency response teams. Areas within closest proximity to the releases are generally at the greatest risk; however, depending on the material, a release can travel great distances or persist over a long time (e.g., nuclear radiation), resulting in far-reaching effects on people and the environment.

A hazmat release, whether accidental or intentional, can be exacerbated or mitigated by specific circumstances surrounding the event. Exacerbating conditions are characteristics that can enhance or magnify effects of a hazard and mitigating conditions are characteristics of the target and its physical environment that can reduce effects of a hazard. These conditions are described below:

- Non-compliance with applicable codes (e.g., fire and building codes) and maintenance failures (e.g., fire protection and containment features) – can substantially increase damage to a facility and to surrounding buildings.
- Geographic location of hazmat site – if occurring within a Special Flood Hazard Area (SFHA), a materials release could cause large-scale water contamination during a flood incident, or a flood incident could compromise production and storage of hazardous chemicals. Stormwaters and floodwaters can also move toxic chemicals swiftly across great distances.
- Weather conditions – affect how the hazard develops.



- Micro-meteorological effects of buildings and terrain – alter dispersion of materials.
- Shielding in the form of sheltering-in-place – protects people and property from harmful effects.

The worst-case scenario event would be a large, uncontrolled release of a toxic gas within a major urban area. In Chester County, this could take the form of an accident and major rupture of a tanker hauling a toxic or flammable gas in or near West Chester. While little physical property damage is likely from this type of event, the potential for injury and death to people up to 0.25 mile from the scene is significant. This event would likely overwhelm the medical care capacity within the county, and possibly the region. The population vulnerable to such a release includes the 19,888 people in West Chester alone. In addition, an event such as this would likely close county offices, causing a major disruption to government operations. The most likely scenario would be a transportation accident resulting in a rupture of a truck’s fuel tank, spilling a small quantity of diesel fuel onto the roadway.

4.3.4.3 Past Occurrence

The county has experienced hazmat release accidents at facilities and along roadways. For most incidents, the County Hazmat Team’s representative is contacted by the on-scene fire department for technical advice about addressing the hazardous material. Since 2017, 683 incidents have occurred in which the County Hazmat Team was contacted for technical advice. Of these, the County Hazmat Team provided on-scene response in 383 hazmat fuel spill incidents. Treddyfrin Township had the most cases, with 27 total incidents.

One significant incident occurred in West Nottingham Township on July 10, 2017, where several people were hospitalized after a hazmat leak. At least eight people had to be treated after a hazmat situation occurred at a home on Red Oak Drive in the Nottingham Manor section of the township. Seven responders were sent through decontamination protocol and transported to Lancaster General Hospital in addition to one resident. Chester County Hazmat crews donned full suits before thoroughly checking the home. No hazards were found, and neither the type of leaked hazardous material or the extent of the contamination was able to be clearly determined (Heinze 2017). Table 4.3.4-1 shows hazardous material and nuclear/radiological incidents by municipality that have occurred from 2014 to 2019.



Table 4.3.4-1. Past Hazardous Materials Incidents 2014-2019

Municipality	2014		2015		2016		2017		2018		2019	
	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.
Avondale Borough	0	0	0	0	0	0	0	0	3	0	0	0
Caln Township	1	0	0	1	1	0	0	0	0	0	0	0
Charlestown Township	0	0	0	0	0	0	0	0	0	0	1	0
Coatesville City	2	0	0	0	0	0	2	0	0	0	1	0
Downingtown Borough	0	0	0	0	0	0	2	0	1	0	0	0
East Bradford Township	0	0	1	0	0	0	0	0	0	0	0	0
East Brandywine Township	1	0	0	0	1	0	0	0	0	0	0	0
East Caln Township	0	0	0	0	1	0	1	0	0	0	0	0
East Fallowfield Township	0	0	2	0	0	0	0	0	0	0	0	0
East Goshen Township	0	0	1	0	1	0	0	0	2	0	0	0
East Marlborough Township	0	0	1	0	0	0	0	0	1	0	0	0
East Pikeland Township	2	0	0	0	0	0	0	1	0	0	0	0
East Vincent Township	1	0	0	0	2	0	1	0	1	0	0	0
East Whiteland Township	0	0	0	0	1	0	2	0	2	0	1	0
Eastown Township	0	0	0	0	0	0	0	0	2	0	0	0
Elk Township	0	0	0	0	0	0	0	0	1	0	0	0
Franklin Township	0	0	0	0	0	0	1	0	0	0	0	0
Honey Brook Borough	1	0	0	0	0	0	0	0	0	0	0	0
Honey Brook Township	0	0	0	0	0	0	0	0	1	0	0	0
Kennett Township	0	0	0	0	0	0	1	0	0	0	0	0
Londonderry Township	1	0	0	0	0	0	0	0	0	0	0	0
Lower Oxford Township	0	0	0	0	4	0	0	0	0	0	0	0
Malvern Borough	2	0	0	0	0	0	0	0	0	0	0	0
New Garden Township	0	0	1	0	0	0	3	0	0	0	0	0
Newlin Township	0	0	0	0	0	0	0	0	0	0	1	0
North Coventry Township	0	0	0	0	1	0	1	0	0	0	0	0
Oxford Borough	0	0	0	0	1	0	0	0	2	0	0	0
Parkesburg Borough	1	0	0	0	0	0	0	0	0	0	0	0
Penn Township	0	0	0	0	0	0	0	0	0	0	1	0
Pennsbury Township	0	0	0	0	0	0	0	0	1	0	1	0



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Municipality	2014		2015		2016		2017		2018		2019	
	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.	HM	Nuclear/ Rad.
Phoenixville Borough	2	0	0	0	0	0	0	0	0	0	0	0
Pocopson Township	0	0	0	0	2	0	0	0	0	0	0	0
Sadsbury Township	1	0	0	0	0	0	0	0	1	0	0	0
Schuylkill Township	0	0	0	0	0	0	0	1	0	0	1	0
Spring City Borough	0	0	1	0	0	0	1	0	0	0	0	0
Tredyffrin Township	1	0	1	0	2	0	1	0	7	0	0	0
Upper Uwchlan Township	1	0	2	0	0	0	0	1	0	0	0	0
Uwchlan Township	0	0	0	0	0	0	2	0	2	0	0	0
Wallace Township	0	0	0	0	0	0	0	0	1	0	0	0
Warwick Township	0	0	0	2	0	0	0	1	0	0	0	0
West Bradford Township	1	0	2	0	0	0	1	0	0	0	0	0
West Brandywine Township	0	0	0	0	0	0	0	0	1	0	0	0
West Caln Township	0	0	0	0	1	0	0	0	1	0	0	0
West Chester Borough	4	0	2	0	2	0	1	0	2	0	0	0
West Fallowfield Township	0	0	0	0	1	0	0	0	1	0	0	0
West Goshen Township	0	0	3	0	1	0	1	0	1	0	0	0
West Grove Borough	0	0	0	0	2	0	0	0	0	0	0	0
West Marlborough Township	1	0	0	0	0	0	0	0	0	0	0	0
West Nottingham Township	0	0	0	0	0	0	1	0	0	0	0	0
West Pikeland Township	2	0	0	0	1	0	0	0	0	0	0	0
West Sadsbury Township	0	0	0	0	0	0	0	0	1	0	0	0
West Vincent Township	0	0	0	0	0	0	0	0	2	0	0	0
West Whiteland Township	0	0	0	0	0	0	1	0	1	0	0	0
Westtown Township	0	0	0	0	1	0	0	0	0	0	0	0
Willistown Township	0	0	0	0	0	0	0	0	0	0	1	0
Total	27	2	18	3	27	1	25	5	40	1	9	0

Source: Chester County DES, 2020

Notes: HM: Hazmat

Rad.: Radiological





4.3.4.4 Future Occurrence

Because of the wide scope of the definition of environmental hazards, ranging from a small spill to a large release of a highly volatile or toxic hazardous material, incidents can and will happen at any time. Probability of future occurrence in Chester County is compounded by the fact that the county is home to 293 SARA facilities. Although these facilities follow applicable safety and health regulations and best practices, proximity of facilities to population centers is a concern for the county.

Hazardous materials are also transported via rail and along roadways such as I-76, US-30, US-202, US-322, PA-3, PA-272, PA-282, PA-372, and PA-501. Transportation of hazmats on highways involves tanker trucks or trailers; not surprisingly, trucks are responsible for the greatest number of hazmat incidents. At several points, these transportation routes cross streams within the watersheds that are part of the county's domestic water supply.

While hazmat release incidents in Chester County have occurred in the past, they are generally considered difficult to predict. Smaller incidents, such as fuel spills, will affect the county many times each year, most likely along I-76 or during refilling of home heating oil tanks, and may not be reported. Although the county does not anticipate severe releases on any regular basis, the possibility of a significant release should not be discounted. Based on Risk Factor Methodology Probability Criteria, likelihood of future occurrences within Chester County remains *highly likely*.

4.3.4.5 Vulnerability Assessment

To understand risk, a community must evaluate the assets exposed and vulnerable in the identified hazard area. The following sections evaluate and estimate potential impacts in Chester County:

- Overview of vulnerability
- Impacts on (1) life, health, and safety; (2) general building stock; (3) critical facilities, (4) the economy, and (5) the environment
- Cascading effect on other hazards
- Future growth and development

A spatial analysis was conducted using various lengths of buffer radii around hazardous material facilities and transportation networks. If a hazardous material incident occurred in or on the facility, pipeline, or transportation network, these buffers would represent the toxin or radiation release area.

Overview of Vulnerability

For the purposes of the assessment, an asset (population, structures, critical facilities, and lifelines) is considered exposed and potentially vulnerable to the hazmat hazard if it is located within these hazardous material buffer areas. The analysis looked at three different hazardous material buffer areas:

1. 0.5 mile from a major highway
2. 0.5 mile from a rail line
3. Unique radius for each SARA Type II facility

Facilities that produce, use, or ship hazmats within the Commonwealth of Pennsylvania are required to comply with regulations set forth within the federal SARA and the Emergency Planning and Community Right to Know Act (EPCRA), and the Commonwealth of Pennsylvania reporting requirements under the Hazardous Materials Emergency Planning and Response Act (Act 165). The county has 293 SARA Title III facilities.

As stated above, hazardous materials are transported via rail, and along major roadways in the county, including one interstate (I-76), three U.S. highways (US-30, US-202, US-322) and five state highways (PA-3, PA-272, PA-282, PA-372, and PA-501). Accidents on these routes can result in hazmat spills that can contaminate and impact surrounding populations and environment.



Impact on Life, Health, and Safety

Much of the population in Chester County is exposed to some kind of environmental hazard (Table 4.3.4-2). Several incidents reported in the county are related to petroleum spills, which may have resulted from motor vehicle incidents. First responders’ safety may also be at risk during on-scene operations and may have difficulty traveling to incidents due to limited access to roads. First responder resources may be exhausted during environmental hazard events due to a lack of personnel and a higher than normal call volume/demand.

Table 4.3.4-2. Estimated Chester County Population Vulnerable to Environmental Hazards

Jurisdiction	Total Population	Within 0.5 Mile of a Highway		Within 0.5 Mile of a Railroad		Within the SARA Site Radius Area	
		Number of People	Percent of Total	Number of People	Percent of Total	Number of People	Percent of Total
Atglen (B)	1,459	1,440	98.7%	1,334	91.4%	1,459	100.0%
Avondale (B)	1,295	1,295	100.0%	1,295	100.0%	1,295	100.0%
Birmingham (Twp)	4,207	2,349	55.8%	504	12.0%	4,207	100.0%
Caln (Twp)	14,198	14,146	99.6%	7,414	52.2%	13,035	91.8%
Charlestown (Twp)	5,813	3,712	63.9%	1,703	29.3%	5,813	100.0%
Coatesville (C)	13,147	13,147	100.0%	13,098	99.6%	13,147	100.0%
Downingtown (B)	7,929	7,929	100.0%	6,471	81.6%	7,929	100.0%
East Bradford (Twp)	9,959	7,366	74.0%	895	9.0%	9,959	100.0%
East Brandywine (Twp)	8,416	5,145	61.1%	0	0.0%	3,344	39.7%
East Caln (Twp)	4,876	4,179	85.7%	1,018	20.9%	4,876	100.0%
East Coventry (Twp)	6,770	2,708	40.0%	188	2.8%	1,869	27.6%
East Fallowfield (Twp)	7,567	2,996	39.6%	1,056	14.0%	7,350	97.1%
East Goshen (Twp)	18,199	11,758	64.6%	3	<0.1%	18,199	100.0%
East Marlborough (Twp)	7,326	6,186	84.4%	0	0.0%	6,479	88.4%
East Nantmeal (Twp)	1,723	998	57.9%	0	0.0%	334	19.4%
East Nottingham (Twp)	8,929	2,819	31.6%	2,733	30.6%	8,074	90.4%
East Pikeland (Twp)	7,331	4,978	67.9%	344	4.7%	5,392	73.6%
East Vincent (Twp)	10,603	6,800	64.1%	0	0.0%	7,153	67.5%
East Whiteland (Twp)	7,062	6,183	87.6%	3,490	49.4%	7,062	100.0%
Easttown (Twp)	11,415	7,972	69.8%	4,592	40.2%	11,253	98.6%
Elk (Twp)	1,786	1,461	81.8%	0	0.0%	2	0.1%
Elverson (B)	1,405	1,405	100.0%	0	0.0%	1,405	100.0%
Franklin (Twp)	4,506	2,545	56.5%	0	0.0%	19	0.4%
Highland (Twp)	1,370	546	39.9%	2	0.1%	841	61.4%
Honey Brook (B)	1,865	1,865	100.0%	0	0.0%	1,825	97.9%
Honey Brook (Twp)	8,205	4,483	54.6%	0	0.0%	4,822	58.8%
Kennett (Twp)	8,177	4,568	55.9%	2,551	31.2%	7,739	94.6%
Kennett Square (B)	6,159	6,041	98.1%	5,645	91.7%	6,159	100.0%
London Britain (Twp)	3,241	883	27.2%	0	0.0%	345	10.6%
London Grove (Twp)	2,450	1,294	52.8%	594	24.2%	817	33.3%
Londonderry (Twp)	8,615	6,537	75.9%	0	0.0%	3,028	35.1%



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Population	Within 0.5 Mile of a Highway		Within 0.5 Mile of a Railroad		Within the SARA Site Radius Area	
		Number of People	Percent of Total	Number of People	Percent of Total	Number of People	Percent of Total
Lower Oxford (Twp)	5,058	2,167	42.8%	1,438	28.4%	4,453	88.0%
Malvern (B)	3,440	1,228	35.7%	3,272	95.1%	3,440	100.0%
Modena (B)	873	0	0.0%	873	100.0%	873	100.0%
New Garden (Twp)	12,111	3,499	28.9%	1,695	14.0%	8,912	73.6%
New London (Twp)	1,312	501	38.2%	0	0.0%	315	24.0%
Newlin (Twp)	5,921	3,168	53.5%	3,539	59.8%	3,394	57.3%
North Coventry (Twp)	7,996	4,300	53.8%	969	12.1%	1,315	16.4%
Oxford (B)	5,420	5,261	97.1%	4,308	79.5%	5,420	100.0%
Parkesburg (B)	3,781	3,781	100.0%	3,580	94.7%	3,781	100.0%
Penn (Twp)	5,511	4,030	73.1%	2,857	51.8%	3,617	65.6%
Pennsbury (Twp)	3,649	2,932	80.4%	1,263	34.6%	3,649	100.0%
Phoenixville (B)	16,815	16,305	97.0%	12,149	72.3%	16,528	98.3%
Pocopson (Twp)	4,838	3,519	72.7%	1,485	30.7%	4,838	100.0%
Sadsbury (Twp)	3,919	3,559	90.8%	1,400	35.7%	3,868	98.7%
Schuylkill (Twp)	8,639	5,484	63.5%	3,655	42.3%	8,404	97.3%
South Coatesville (B)	1,276	214	16.8%	1,151	90.2%	1,276	100.0%
South Coventry (Twp)	2,631	1,740	66.1%	0	0.0%	351	13.3%
Spring City (B)	3,320	1,066	32.1%	1,603	48.3%	3,320	100.0%
Thornbury (Twp)	3,181	2,326	73.1%	447	14.1%	3,181	100.0%
Tredyffrin (Twp)	29,481	20,366	69.1%	14,861	50.4%	29,312	99.4%
Upper Oxford (Twp)	2,518	1,954	77.6%	84	3.3%	1,895	75.3%
Upper Uwchlan (Twp)	11,509	6,464	56.2%	0	0.0%	4,650	40.4%
Uwchlan (Twp)	18,869	10,864	57.6%	0	0.0%	18,869	100.0%
Valley (Twp)	7,661	7,651	99.9%	4,570	59.7%	7,661	100.0%
Wallace (Twp)	3,678	2,118	57.6%	0	0.0%	364	9.9%
Warwick (Twp)	2,543	1,259	49.5%	0	0.0%	634	24.9%
West Bradford (Twp)	12,869	1,996	15.5%	206	1.6%	10,591	82.3%
West Brandywine (Twp)	7,482	4,381	58.6%	0	0.0%	3,418	45.7%
West Caln (Twp)	9,080	3,972	43.7%	0	0.0%	8,718	96.0%
West Chester (B)	19,888	19,888	100.0%	9,904	49.8%	19,888	100.0%
West Fallowfield (Twp)	2,596	1,341	51.7%	0	0.0%	865	33.3%
West Goshen (Twp)	23,021	16,342	71.0%	1,161	5.0%	23,021	100.0%
West Grove (B)	2,846	2,846	100.0%	2,736	96.1%	1,837	64.5%
West Marlborough (Twp)	771	566	73.4%	0	0.0%	292	37.9%
West Nantmeal (Twp)	1,999	1,005	50.3%	0	0.0%	1,436	71.8%
West Nottingham (Twp)	2,718	1,200	44.2%	631	23.2%	459	16.9%
West Pikeland (Twp)	4,069	2,558	62.9%	0	0.0%	4,056	99.7%
West Sadsbury (Twp)	2,393	1,459	61.0%	770	32.2%	2,126	88.8%
West Vincent (Twp)	5,257	2,213	42.1%	0	0.0%	1,394	26.5%





**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Population	Within 0.5 Mile of a Highway		Within 0.5 Mile of a Railroad		Within the SARA Site Radius Area	
		Number of People	Percent of Total	Number of People	Percent of Total	Number of People	Percent of Total
West Whiteland (Twp)	18,403	12,391	67.3%	5,711	31.0%	18,403	100.0%
Westtown (Twp)	10,916	7,513	68.8%	2,429	22.3%	10,916	100.0%
Willistown (Twp)	10,895	5,105	46.9%	2,629	24.1%	10,895	100.0%
Chester County (Total)	517,156	346,267	67.0%	146,307	28.3%	427,866	82.7%

Sources: U.S. Census 2018; Chester County Geographic Information System (GIS) 2020; Pennsylvania Department of Transportation (PennDOT) 2018

Notes: % = Percent; B = Borough; C = City; SARA = Superfund Amendments and Reauthorization Act; Twp = Township

Impacts on General Building Stock

Potential losses to the general building stock caused by a hazmat incident is difficult to quantify. The degree of damages to the general building stock depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. The closure of waterways, railroads, airports and highways as a result of a hazmat incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may have local, regional, or statewide effects depending on the magnitude of the event and level of service disruptions.

To estimate the buildings exposed to a hazardous material event, the hazmat buffer areas were overlaid upon the building level. The replacement cost value of the structures with their center in the buffer areas were totaled (Table 4.3.4-3 and Table 4.3.4-4). The area with the largest exposure to replacement cost value are those buffer areas that extend out along highways. However, if a hazmat release were to occur, the incident would not be located along all highways in the county, but instead only a section of the total hazmat exposure area. Similarly, a railway or SARA site hazardous material incident would not occur in all areas of the structure, but instead only along one section or within one site. Therefore, the total exposure does not represent a complete vulnerability, should a hazard event occur.



Table 4.3.4-3. Total Building Exposed to a Highway or Railroad Hazardous Material Incident

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within 0.5 Mile of a Highway				Within 0.5 Mile of a Railroad			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Atglen (B)	583	\$300,171,233	576	98.8%	\$297,198,629	99.0%	536	91.9%	\$280,356,328	93.4%
Avondale (B)	436	\$275,491,131	436	100.0%	\$275,491,131	100.0%	436	100.0%	\$275,491,131	100.0%
Birmingham (Twp)	1,774	\$1,521,752,088	973	54.8%	\$845,267,463	55.5%	227	12.8%	\$171,953,873	11.3%
Caln (Twp)	5,696	\$4,389,258,174	5,677	99.7%	\$4,380,380,212	99.8%	3,040	53.4%	\$2,625,403,864	59.8%
Charlestown (Twp)	2,655	\$2,334,124,537	1,613	60.8%	\$1,498,699,890	64.2%	809	30.5%	\$963,373,978	41.3%
Coatesville (C)	3,545	\$2,658,702,748	3,545	100.0%	\$2,658,702,748	100.0%	3,525	99.4%	\$2,647,342,168	99.6%
Downingtown (B)	2,619	\$2,678,308,815	2,602	99.4%	\$2,311,481,739	86.3%	2,108	80.5%	\$1,892,838,748	70.7%
East Bradford (Twp)	4,033	\$3,166,888,223	2,963	73.5%	\$2,545,079,007	80.4%	379	9.4%	\$249,825,606	7.9%
East Brandywine (Twp)	4,201	\$2,499,920,165	2,556	60.8%	\$1,456,458,000	58.3%	0	0.0%	\$0	0.0%
East Caln (Twp)	1,509	\$1,864,909,402	1,283	85.0%	\$1,616,909,063	86.7%	402	26.6%	\$654,854,901	35.1%
East Coventry (Twp)	3,832	\$2,200,926,728	1,602	41.8%	\$1,076,358,460	48.9%	121	3.2%	\$157,359,507	7.1%
East Fallowfield (Twp)	4,025	\$1,984,687,476	1,549	38.5%	\$731,951,166	36.9%	583	14.5%	\$299,575,231	15.1%
East Goshen (Twp)	6,498	\$5,680,635,001	4,104	63.2%	\$3,173,423,220	55.9%	1	<0.1%	\$322,154	<0.1%
East Marlborough (Twp)	3,888	\$3,646,563,821	3,307	85.1%	\$3,230,830,087	88.6%	0	0.0%	\$0	0.0%
East Nantmeal (Twp)	1,509	\$1,131,945,456	854	56.6%	\$642,221,101	56.7%	0	0.0%	\$0	0.0%
East Nottingham (Twp)	4,960	\$3,185,167,607	1,632	32.9%	\$1,130,445,220	35.5%	1,438	29.0%	\$826,504,007	25.9%
East Pikeland (Twp)	3,959	\$2,751,413,608	2,735	69.1%	\$2,033,961,708	73.9%	215	5.4%	\$240,265,904	8.7%



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within 0.5 Mile of a Highway				Within 0.5 Mile of a Railroad			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
East Vincent (Twp)	3,872	\$2,764,012,516	2,374	61.3%	\$1,455,742,616	52.7%	39	1.0%	\$73,119,105	2.6%
East Whiteland (Twp)	5,002	\$8,143,686,632	4,408	88.1%	\$7,375,168,175	90.6%	2,595	51.9%	\$3,984,140,708	48.9%
Easttown (Twp)	4,583	\$3,998,338,009	3,240	70.7%	\$2,855,778,150	71.4%	1,933	42.2%	\$1,761,897,829	44.1%
Elk (Twp)	1,361	\$754,193,647	1,023	75.2%	\$520,399,133	69.0%	0	0.0%	\$0	0.0%
Elverson (B)	716	\$516,332,051	716	100.0%	\$516,332,051	100.0%	0	0.0%	\$0	0.0%
Franklin (Twp)	2,468	\$1,537,535,450	1,438	58.3%	\$898,180,943	58.4%	0	0.0%	\$0	0.0%
Highland (Twp)	1,304	\$1,067,555,265	475	36.4%	\$385,996,499	36.2%	1	0.1%	\$184,660	<0.1%
Honey Brook (B)	771	\$446,825,932	771	100.0%	\$446,825,932	100.0%	0	0.0%	\$0	0.0%
Honey Brook (Twp)	4,871	\$3,389,705,910	2,527	51.9%	\$1,693,619,012	50.0%	0	0.0%	\$0	0.0%
Kennett (Twp)	4,166	\$4,134,894,338	2,333	56.0%	\$2,231,542,277	54.0%	1,440	34.6%	\$1,713,189,431	41.4%
Kennett Square (B)	1,956	\$1,600,982,472	1,922	98.3%	\$1,586,724,910	99.1%	1,809	92.5%	\$1,520,332,968	95.0%
London Britain (Twp)	1,782	\$1,064,040,035	484	27.2%	\$265,266,597	24.9%	0	0.0%	\$0	0.0%
London Grove (Twp)	4,233	\$3,148,102,405	2,353	55.6%	\$1,694,808,647	53.8%	1,085	25.6%	\$950,737,204	30.2%
Londonderry (Twp)	1,755	\$1,034,199,367	1,299	74.0%	\$734,243,469	71.0%	0	0.0%	\$0	0.0%
Lower Oxford (Twp)	2,585	\$2,325,017,464	1,061	41.0%	\$873,918,607	37.6%	610	23.6%	\$549,682,683	23.6%
Malvern (B)	1,149	\$1,256,307,741	435	37.9%	\$512,459,622	40.8%	1,074	93.5%	\$1,049,729,066	83.6%
Modena (B)	226	\$143,886,459	0	0.0%	\$0	0.0%	226	100.0%	\$143,886,459	100.0%
New Garden (Twp)	5,418	\$5,996,313,471	1,689	31.2%	\$1,976,885,519	33.0%	1,062	19.6%	\$1,755,167,314	29.3%
New London (Twp)	2,955	\$1,850,994,293	1,057	35.8%	\$679,056,083	36.7%	0	0.0%	\$0	0.0%
Newlin (Twp)	1,188	\$767,919,221	611	51.4%	\$417,778,319	54.4%	630	53.0%	\$326,641,279	42.5%
North Coventry (Twp)	4,367	\$2,814,129,243	2,435	55.8%	\$1,896,023,275	67.4%	565	12.9%	\$300,753,644	10.7%





**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within 0.5 Mile of a Highway				Within 0.5 Mile of a Railroad			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Oxford (B)	1,795	\$1,620,222,123	1,738	96.8%	\$1,582,948,763	97.7%	1,454	81.0%	\$1,395,042,150	86.1%
Parkesburg (B)	1,478	\$791,790,495	1,478	100.0%	\$791,790,495	100.0%	1,403	94.9%	\$755,751,642	95.4%
Penn (Twp)	2,962	\$3,335,917,017	2,254	76.1%	\$2,992,647,209	89.7%	1,361	45.9%	\$1,035,381,912	31.0%
Pennsbury (Twp)	1,793	\$1,741,030,601	1,400	78.1%	\$1,402,346,104	80.5%	658	36.7%	\$541,233,227	31.1%
Phoenixville (B)	6,031	\$4,404,373,172	5,843	96.9%	\$4,187,425,761	95.1%	4,395	72.9%	\$3,371,816,016	76.6%
Pocopson (Twp)	1,781	\$1,616,048,060	1,272	71.4%	\$1,146,115,553	70.9%	551	30.9%	\$564,705,368	34.9%
Sadsbury (Twp)	2,244	\$1,514,078,865	2,030	90.5%	\$1,389,447,462	91.8%	783	34.9%	\$404,400,905	26.7%
Schuylkill (Twp)	4,116	\$3,296,773,180	2,597	63.1%	\$1,860,943,953	56.4%	1,803	43.8%	\$1,458,652,387	44.2%
South Coatesville (B)	669	\$656,482,254	124	18.5%	\$195,946,455	29.8%	612	91.5%	\$613,462,466	93.4%
South Coventry (Twp)	1,655	\$1,175,837,157	1,135	68.6%	\$927,917,968	78.9%	0	0.0%	\$0	0.0%
Spring City (B)	1,282	\$913,935,869	376	29.3%	\$158,561,543	17.3%	672	52.4%	\$637,633,561	69.8%
Thornbury (Twp)	1,222	\$1,249,939,720	901	73.7%	\$938,769,065	75.1%	198	16.2%	\$310,147,833	24.8%
Tredyffrin (Twp)	10,751	\$13,427,976,905	7,580	70.5%	\$11,192,971,382	83.4%	5,533	51.5%	\$7,878,048,180	58.7%
Upper Oxford (Twp)	2,098	\$1,327,197,078	1,535	73.2%	\$954,588,591	71.9%	54	2.6%	\$26,322,279	2.0%
Upper Uwchlan (Twp)	4,459	\$3,757,709,779	2,591	58.1%	\$2,515,581,482	66.9%	0	0.0%	\$0	0.0%
Uwchlan (Twp)	6,633	\$7,025,589,763	3,955	59.6%	\$5,112,197,385	72.8%	0	0.0%	\$0	0.0%
Valley (Twp)	3,430	\$2,597,377,442	3,420	99.7%	\$2,529,749,701	97.4%	2,034	59.3%	\$1,516,244,033	58.4%
Wallace (Twp)	2,069	\$1,322,743,721	1,204	58.2%	\$760,100,238	57.5%	0	0.0%	\$0	0.0%
Warwick (Twp)	2,175	\$1,133,542,100	1,077	49.5%	\$555,937,188	49.0%	0	0.0%	\$0	0.0%
West Bradford (Twp)	6,163	\$3,995,074,181	1,060	17.2%	\$1,155,426,477	28.9%	138	2.2%	\$106,972,629	2.7%



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within 0.5 Mile of a Highway				Within 0.5 Mile of a Railroad			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
West Brandywine (Twp)	4,149	\$2,231,906,820	2,460	59.3%	\$1,365,213,198	61.2%	0	0.0%	\$0	0.0%
West Caln (Twp)	6,021	\$2,765,167,902	2,685	44.6%	\$1,367,140,100	49.4%	0	0.0%	\$0	0.0%
West Chester (B)	4,156	\$5,374,643,016	4,156	100.0%	\$5,374,643,016	100.0%	2,285	55.0%	\$3,646,702,380	67.9%
West Fallowfield (Twp)	2,171	\$1,743,066,295	996	45.9%	\$778,140,957	44.6%	0	0.0%	\$0	0.0%
West Goshen (Twp)	8,399	\$9,444,801,871	6,134	73.0%	\$7,688,405,259	81.4%	631	7.5%	\$1,753,943,367	18.6%
West Grove (B)	1,053	\$499,625,186	1,053	100.0%	\$499,625,186	100.0%	1,015	96.4%	\$487,051,010	97.5%
West Marlborough (Twp)	967	\$997,081,475	759	78.5%	\$777,350,477	78.0%	0	0.0%	\$0	0.0%
West Nantmeal (Twp)	1,830	\$1,139,858,316	941	51.4%	\$554,774,554	48.7%	0	0.0%	\$0	0.0%
West Nottingham (Twp)	1,989	\$1,196,217,005	887	44.6%	\$662,484,420	55.4%	479	24.1%	\$442,582,387	37.0%
West Pikeland (Twp)	2,120	\$1,506,034,830	1,350	63.7%	\$971,470,059	64.5%	0	0.0%	\$0	0.0%
West Sadsbury (Twp)	1,876	\$1,651,357,888	1,136	60.6%	\$1,207,110,667	73.1%	531	28.3%	\$630,613,354	38.2%
West Vincent (Twp)	3,532	\$2,587,356,437	1,384	39.2%	\$1,028,394,570	39.7%	0	0.0%	\$0	0.0%
West Whiteland (Twp)	7,022	\$7,660,221,171	4,898	69.8%	\$6,554,235,848	85.6%	2,224	31.7%	\$2,750,401,915	35.9%
Westtown (Twp)	4,175	\$3,282,102,771	2,844	68.1%	\$2,250,235,704	68.6%	925	22.2%	\$799,383,618	24.4%
Willistown (Twp)	6,043	\$4,727,817,226	2,632	43.6%	\$1,749,718,126	37.0%	1,387	23.0%	\$966,382,958	20.4%
Chester County (Total)	232,759	\$194,736,735,824	148,543	63.8%	\$134,101,963,596	68.9%	58,015	24.9%	\$57,507,805,329	29.5%

Sources: U.S. Census 2018; Chester County GIS 2020; RSMears 2019; PennDOT 2018
Notes: % = Percent; B = Borough; C = City; Twp = Township





*Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases*

Table 4.3.4-4. Total Building Exposed to a SARA Site Hazardous Material Incident

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within the SARA Site Radius Area			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Atglen (B)	583	\$300,171,233	583	100.0%	\$300,171,233	100.0%
Avondale (B)	436	\$275,491,131	436	100.0%	\$275,491,131	100.0%
Birmingham (Twp)	1,774	\$1,521,752,088	1,774	100.0%	\$1,521,752,088	100.0%
Caln (Twp)	5,696	\$4,389,258,174	5,239	92.0%	\$4,106,192,334	93.6%
Charlestown (Twp)	2,655	\$2,334,124,537	2,655	100.0%	\$2,334,124,537	100.0%
Coatesville (C)	3,545	\$2,658,702,748	3,545	100.0%	\$2,658,702,748	100.0%
Downingtown (B)	2,619	\$2,678,308,815	2,619	100.0%	\$2,678,308,815	100.0%
East Bradford (Twp)	4,033	\$3,166,888,223	4,033	100.0%	\$3,166,888,223	100.0%
East Brandywine (Twp)	4,201	\$2,499,920,165	1,675	39.9%	\$953,895,245	38.2%
East Caln (Twp)	1,509	\$1,864,909,402	1,509	100.0%	\$1,864,909,402	100.0%
East Coventry (Twp)	3,832	\$2,200,926,728	1,112	29.0%	\$688,790,255	31.3%
East Fallowfield (Twp)	4,025	\$1,984,687,476	3,902	96.9%	\$1,923,706,890	96.9%
East Goshen (Twp)	6,498	\$5,680,635,001	6,498	100.0%	\$5,680,635,001	100.0%
East Marlborough (Twp)	3,888	\$3,646,563,821	3,397	87.4%	\$3,299,865,313	90.5%
East Nantmeal (Twp)	1,509	\$1,131,945,456	261	17.3%	\$192,410,393	17.0%
East Nottingham (Twp)	4,960	\$3,185,167,607	4,437	89.5%	\$2,810,964,304	88.3%
East Pikeland (Twp)	3,959	\$2,751,413,608	2,921	73.8%	\$2,056,224,411	74.7%
East Vincent (Twp)	3,872	\$2,764,012,516	2,567	66.3%	\$1,939,501,265	70.2%
East Whiteland (Twp)	5,002	\$8,143,686,632	5,002	100.0%	\$8,143,686,632	100.0%
Easttown (Twp)	4,583	\$3,998,338,009	4,522	98.7%	\$3,951,028,816	98.8%
Elk (Twp)	1,361	\$754,193,647	1	0.1%	\$209,682	<0.1%
Elverson (B)	716	\$516,332,051	716	100.0%	\$516,332,051	100.0%
Franklin (Twp)	2,468	\$1,537,535,450	9	0.4%	\$4,754,171	0.3%
Highland (Twp)	1,304	\$1,067,555,265	738	56.6%	\$592,951,425	55.5%
Honey Brook (B)	771	\$446,825,932	754	97.8%	\$424,143,487	94.9%
Honey Brook (Twp)	4,871	\$3,389,705,910	2,950	60.6%	\$2,296,239,577	67.7%
Kennett (Twp)	4,166	\$4,134,894,338	3,962	95.1%	\$3,973,396,780	96.1%
Kennett Square (B)	1,956	\$1,600,982,472	1,956	100.0%	\$1,600,982,472	100.0%
London Britain (Twp)	1,782	\$1,064,040,035	180	10.1%	\$84,912,338	8.0%
London Grove (Twp)	4,233	\$3,148,102,405	1,468	34.7%	\$1,314,333,278	41.8%
Londonderry (Twp)	1,755	\$1,034,199,367	592	33.7%	\$356,871,169	34.5%
Lower Oxford (Twp)	2,585	\$2,325,017,464	2,223	86.0%	\$2,100,448,044	90.3%
Malvern (B)	1,149	\$1,256,307,741	1,149	100.0%	\$1,256,307,741	100.0%



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within the SARA Site Radius Area			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Modena (B)	226	\$143,886,459	226	100.0%	\$143,886,459	100.0%
New Garden (Twp)	5,418	\$5,996,313,471	4,268	78.8%	\$5,146,256,198	85.8%
New London (Twp)	2,955	\$1,850,994,293	756	25.6%	\$544,002,479	29.4%
Newlin (Twp)	1,188	\$767,919,221	609	51.3%	\$429,793,072	56.0%
North Coventry (Twp)	4,367	\$2,814,129,243	766	17.5%	\$648,665,884	23.1%
Oxford (B)	1,795	\$1,620,222,123	1,795	100.0%	\$1,620,222,123	100.0%
Parkesburg (B)	1,478	\$791,790,495	1,478	100.0%	\$791,790,495	100.0%
Penn (Twp)	2,962	\$3,335,917,017	2,062	69.6%	\$2,907,606,749	87.2%
Pennsbury (Twp)	1,793	\$1,741,030,601	1,793	100.0%	\$1,741,030,601	100.0%
Phoenixville (B)	6,031	\$4,404,373,172	5,931	98.3%	\$4,350,789,331	98.8%
Pocopson (Twp)	1,781	\$1,616,048,060	1,781	100.0%	\$1,616,048,060	100.0%
Sadsbury (Twp)	2,244	\$1,514,078,865	2,217	98.8%	\$1,506,272,469	99.5%
Schuylkill (Twp)	4,116	\$3,296,773,180	3,998	97.1%	\$3,250,655,803	98.6%
South Coatesville (B)	669	\$656,482,254	669	100.0%	\$656,482,254	100.0%
South Coventry (Twp)	1,655	\$1,175,837,157	202	12.2%	\$98,822,110	8.4%
Spring City (B)	1,282	\$913,935,869	1,282	100.0%	\$913,935,869	100.0%
Thornbury (Twp)	1,222	\$1,249,939,720	1,222	100.0%	\$1,249,939,720	100.0%
Tredyffrin (Twp)	10,751	\$13,427,976,905	10,694	99.5%	\$13,390,372,251	99.7%
Upper Oxford (Twp)	2,098	\$1,327,197,078	1,497	71.4%	\$963,036,672	72.6%
Upper Uwchlan (Twp)	4,459	\$3,757,709,779	1,897	42.5%	\$2,234,923,716	59.5%
Uwchlan (Twp)	6,633	\$7,025,589,763	6,633	100.0%	\$7,025,589,763	100.0%
Valley (Twp)	3,430	\$2,597,377,442	3,430	100.0%	\$2,597,377,442	100.0%
Wallace (Twp)	2,069	\$1,322,743,721	209	10.1%	\$140,491,428	10.6%
Warwick (Twp)	2,175	\$1,133,542,100	509	23.4%	\$235,949,082	20.8%
West Bradford (Twp)	6,163	\$3,995,074,181	5,115	83.0%	\$3,373,707,595	84.4%
West Brandywine (Twp)	4,149	\$2,231,906,820	1,847	44.5%	\$1,085,163,843	48.6%
West Caln (Twp)	6,021	\$2,765,167,902	5,768	95.8%	\$2,663,858,313	96.3%
West Chester (B)	4,156	\$5,374,643,016	4,156	100.0%	\$5,374,643,016	100.0%
West Fallowfield (Twp)	2,171	\$1,743,066,295	826	38.0%	\$778,643,912	44.7%
West Goshen (Twp)	8,399	\$9,444,801,871	8,399	100.0%	\$9,444,801,871	100.0%
West Grove (B)	1,053	\$499,625,186	695	66.0%	\$360,341,476	72.1%
West Marlborough (Twp)	967	\$997,081,475	340	35.2%	\$366,812,230	36.8%
West Nantmeal (Twp)	1,830	\$1,139,858,316	1,337	73.1%	\$872,745,725	76.6%
West Nottingham (Twp)	1,989	\$1,196,217,005	298	15.0%	\$152,195,761	12.7%





**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Within the SARA Site Radius Area			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
West Pikeland (Twp)	2,120	\$1,506,034,830	2,110	99.5%	\$1,493,591,951	99.2%
West Sadsbury (Twp)	1,876	\$1,651,357,888	1,699	90.6%	\$1,578,771,606	95.6%
West Vincent (Twp)	3,532	\$2,587,356,437	863	24.4%	\$701,070,865	27.1%
West Whiteland (Twp)	7,022	\$7,660,221,171	7,022	100.0%	\$7,660,221,171	100.0%
Westtown (Twp)	4,175	\$3,282,102,771	4,175	100.0%	\$3,282,102,771	100.0%
Willistown (Twp)	6,043	\$4,727,817,226	6,043	100.0%	\$4,727,817,226	100.0%
Chester County (Total)	232,759	\$194,736,735,824	182,002	78.2%	\$163,189,560,612	83.8%

Sources: Chester County GIS 2020; RSMeans 2019

Notes: % = Percent; B = Borough; C = City; SARA = Superfund Amendments and Reauthorization Act; Twp = Township

Impacts on Critical Facilities

Potential losses of critical facilities caused by a hazmat incident are difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs. Table 4.3.4-5 summarizes critical facilities and lifelines located within the hazmat buffer area. A total of 4,202 critical facilities are located in Chester County. Overall, 3,164 critical facilities are exposed to a roadway hazardous material event, 1,481 critical facilities are exposed to a rail line hazardous material event, and 3,511 critical facilities are exposed to a SARA site hazardous material facility event.

Table 4.3.4-5. Critical Facility Exposure to the Hazardous Material Buffer Areas

Jurisdictions	Number of Critical Facilities and Lifeline Facilities in Each Hazard Area (Lifelines in parentheses)		
	Railway Incident Exposure	Highway Incident Exposure	SARA Site Incident Exposure
Atglen (B)	19 (16)	20 (17)	20 (17)
Avondale (B)	19 (15)	19 (15)	19 (15)
Birmingham (Twp)	8 (8)	22 (17)	34 (26)
Caln (Twp)	57 (31)	101 (70)	95 (67)
Charlestown (Twp)	37 (21)	43 (26)	64 (45)
Coatesville (C)	75 (42)	79 (45)	79 (45)
Downingtown (B)	69 (40)	74 (49)	86 (53)
East Bradford (Twp)	8 (7)	62 (52)	73 (61)
East Brandywine (Twp)	0 (0)	33 (27)	15 (13)
East Caln (Twp)	28 (15)	48 (19)	64 (29)
East Coventry (Twp)	4 (4)	28 (17)	16 (13)
East Fallowfield (Twp)	14 (11)	31 (22)	70 (53)
East Goshen (Twp)	0 (0)	39 (25)	76 (43)
East Marlborough (Twp)	0 (0)	50 (32)	44 (28)
East Nantmeal (Twp)	0 (0)	18 (16)	4 (4)
East Nottingham (Twp)	13 (7)	20 (19)	42 (33)



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdictions	Number of Critical Facilities and Lifeline Facilities in Each Hazard Area (Lifelines in parentheses)		
	Railway Incident Exposure	Highway Incident Exposure	SARA Site Incident Exposure
East Pikeland (Twp)	3 (3)	35 (23)	40 (29)
East Vincent (Twp)	1 (1)	37 (20)	41 (27)
East Whiteland (Twp)	77 (39)	176 (94)	185 (100)
Easttown (Twp)	34 (19)	44 (24)	69 (37)
Elk (Twp)	0 (0)	9 (8)	0 (0)
Elverson (B)	0 (0)	13 (5)	13 (5)
Franklin (Twp)	0 (0)	17 (13)	1 (1)
Highland (Twp)	0 (0)	7 (4)	11 (9)
Honey Brook (B)	0 (0)	17 (11)	16 (11)
Honey Brook (Twp)	0 (0)	27 (12)	24 (12)
Kennett (Twp)	23 (16)	54 (35)	77 (52)
Kennett Square (B)	42 (25)	42 (25)	42 (25)
London Britain (Twp)	0 (0)	4 (3)	2 (2)
London Grove (Twp)	30 (22)	57 (45)	31 (24)
Londonderry (Twp)	0 (0)	14 (12)	7 (4)
Lower Oxford (Twp)	14 (8)	28 (23)	46 (37)
Malvern (B)	26 (17)	13 (10)	29 (18)
Modena (B)	11 (8)	0 (0)	11 (8)
New Garden (Twp)	24 (9)	49 (31)	83 (43)
New London (Twp)	0 (0)	13 (10)	2 (1)
Newlin (Twp)	25 (24)	18 (17)	15 (15)
North Coventry (Twp)	17 (16)	51 (36)	18 (12)
Oxford (B)	46 (20)	51 (23)	52 (24)
Parkesburg (B)	35 (22)	36 (23)	36 (23)
Penn (Twp)	13 (8)	39 (23)	40 (25)
Pennsbury (Twp)	20 (15)	32 (23)	46 (34)
Phoenixville (B)	67 (42)	88 (54)	88 (54)
Pocopson (Twp)	13 (10)	30 (25)	40 (35)
Sadsbury (Twp)	16 (12)	45 (27)	46 (28)
Schuylkill (Twp)	40 (24)	38 (21)	72 (42)
South Coatesville (B)	21 (11)	6 (3)	22 (12)
South Coventry (Twp)	0 (0)	33 (28)	3 (2)
Spring City (B)	17 (10)	0 (0)	17 (10)
Thornbury (Twp)	13 (12)	18 (15)	21 (18)
Tredyffrin (Twp)	181 (112)	279 (171)	303 (186)
Upper Oxford (Twp)	1 (1)	23 (15)	20 (13)



**Section 4.3.4: Risk Assessment –
Environmental Hazards – Hazardous Materials Releases**

Jurisdictions	Number of Critical Facilities and Lifeline Facilities in Each Hazard Area (Lifelines in parentheses)		
	Railway Incident Exposure	Highway Incident Exposure	SARA Site Incident Exposure
Upper Uwchlan (Twp)	0 (0)	53 (37)	44 (28)
Uwchlan (Twp)	0 (0)	96 (36)	110 (47)
Valley (Twp)	34 (26)	59 (43)	60 (43)
Wallace (Twp)	0 (0)	28 (27)	9 (8)
Warwick (Twp)	0 (0)	27 (22)	5 (2)
West Bradford (Twp)	7 (7)	27 (21)	58 (42)
West Brandywine (Twp)	0 (0)	29 (25)	25 (18)
West Caln (Twp)	0 (0)	27 (17)	37 (26)
West Chester (B)	81 (47)	100 (59)	100 (59)
West Fallowfield (Twp)	0 (0)	19 (16)	17 (12)
West Goshen (Twp)	41 (25)	160 (85)	178 (99)
West Grove (B)	18 (10)	18 (10)	16 (10)
West Marlborough (Twp)	0 (0)	25 (22)	6 (5)
West Nantmeal (Twp)	0 (0)	17 (14)	25 (16)
West Nottingham (Twp)	15 (6)	20 (9)	5 (0)
West Pikeland (Twp)	0 (0)	29 (27)	44 (39)
West Sadsbury (Twp)	15 (6)	31 (13)	37 (19)
West Vincent (Twp)	0 (0)	15 (12)	12 (10)
West Whiteland (Twp)	82 (56)	192 (129)	217 (149)
Westtown (Twp)	10 (9)	31 (21)	46 (31)
Willistown (Twp)	17 (9)	31 (20)	90 (49)
Chester County (Total)	1,481 (924)	3,164 (2,045)	3,511 (2,235)

Sources: Chester County GIS 2020; PennDOT 2018

Notes: % = Percent; B = Borough; C = City; SARA = Superfund Amendments and Reauthorization Act; Twp = Township

Impact on the Economy

If a significant hazmat incident occurs, not only would life, safety, and building stock be at risk, but the economy of Chester County would also be affected. A significant incident within an urban area may force businesses to close for an extended period of time because of contamination or because of direct damage caused by an explosion. Exact impacts on the economy are difficult to predict, given the uncertainty of the size and scope of potential incidents.

Hazmat incidents can lead to closures of major transportation routes in Chester County. Closures of waterways, railroads, airports, and highways as a result of these incidents can hinder delivery of goods and services. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and the extent of disruptions to services. In 2019, the United States experienced nearly \$1 billion in damages from hazmat transportation incidents (DOT 2019).

Impact on the Environment

Hazardous material sites near bodies of water are at high risk in the event of an extreme storm or if high-water levels approach. Such events could release toxins, waste, and other pollutants into the water and greatly impact





surrounding habitats. Many of these sites were intentionally constructed in locations believed to be removed from potential contamination or exposure-increasing factors, but floodplain boundary change increases the likelihood that water may reach hazardous material and waste sites.

Cascading Impacts to Other Hazards

Hazardous substance events can cause utility failure. If a spill or other release occurred, water quality and supply could stop or drastically decrease while the facility restored service. Hazardous material events can also occur along transportation networks. In 2019, the United States experienced over 250 incidents of derailments and accidents from hazardous material spills (DOT 2019). While hazmat transportation along railroads has traditionally been reliable, a hazardous material spill along any transportation network could result in disruption and accidents (Barkan and Kawprasert 2008). Section 4.3.17, Transportation Accident, and Section 4.3.18, Utility Interruption, include more information.

Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

An increase in development and population can increase likelihood of a hazmat incident. Future migration to larger jurisdictions may also increase the likelihood of an incident. The tables and hazard maps included in the jurisdictional annexes in this HMP contain additional information regarding the specific areas of development that would increase county vulnerability to the hazardous materials incident hazard.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicate that Chester's population will continue to increase into 2040, increasing total population to approximately 603,068 persons (Center of Rural Pennsylvania 2013). Persons that move into hazmat exposure areas are at greater risk to be impacted in the event of a spill or toxin release.

Climate Change

No immediate climate change impacts are associated with the hazard.

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also established using RSMMeans 2019 valuations that estimated replacement cost value for each building in the inventory. Additionally, a critical facility dataset was provided from the county. Overall, exposure and vulnerability of the entire county to hazardous material incidents will continue.



4.3.5 Environmental Hazards – Oil and Natural Gas Pipelines

This section provides a profile and vulnerability assessment of the oil and natural gas pipelines hazard profile for the Chester County Hazard Mitigation Plan (HMP).

Product release into the local environment can derive from a fixed facility or occur at any location along a pipeline route, and may be the result of carelessness, technical failure, external incidents, or an intentional act against the facility or container. Release of certain products considered hazardous materials (hazmat) can immediately and adversely impact the general population, causing effects ranging from inconvenient evacuations to personal injury and even death. Moreover, any release can compromise the local environment through contamination of soil, groundwater, or local flora and fauna.

4.3.5.1 Location and Extent

Based on past occurrences, pipeline incidents within Chester County have been accidental and have not been considered terrorist or criminal acts. While past occurrences have not been deemed intentional, an intentional release of any of these products in large quantity would pose a threat to the local population, economy, and environment resulting in lost revenue, injuries, and deaths.

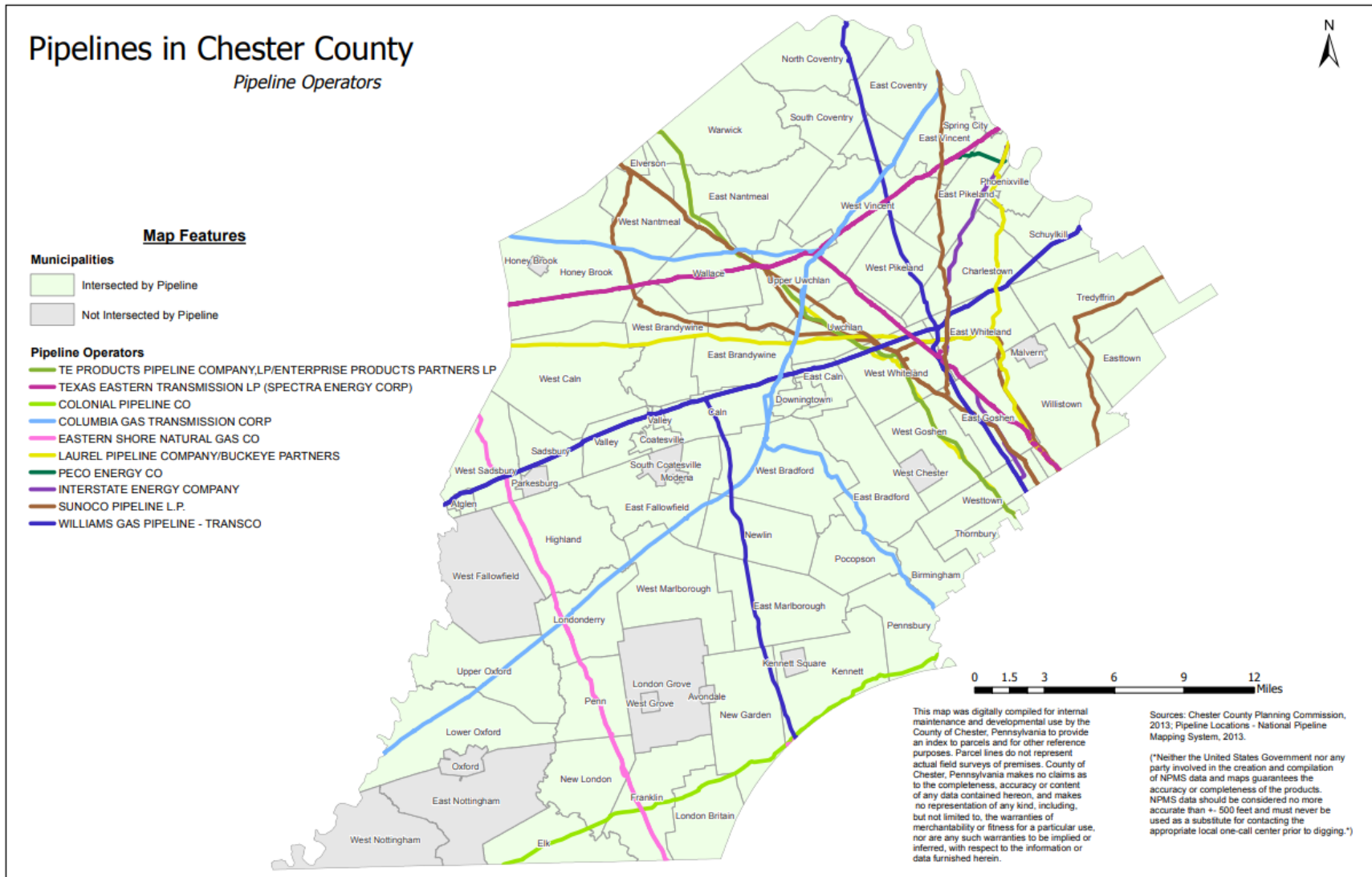
Chester County is home to nearly 600 linear miles of pipelines. Many of the pipelines have been in place for decades; more recently, the construction of new lines and upgrades to existing lines have increased. The county's large agricultural areas increase its vulnerability to pipeline accidents. In 2013, the Chester County Planning Commission created the Pipeline Information Center (PIC) to inform community members of all pipeline issues, pipeline safety, the new pipeline review process, and the latest information on pipeline project activity within the county (Chester County Planning Commission n.d.).

Active pipeline projects in the county include the Mariner East 2 project that carries natural gas, ethane, and propane; 2017 Expansion Project; Northeast Supply Enhancement Project; Greater Philadelphia Expansion Project; and Adelphia Gateway, all of which transport natural gas.

Figure 4.3.5-1 shows pipeline operators in Chester County. Mostly all of the municipalities in Chester County are intersected by pipelines besides Honey Brook Borough, West Fallowfield Township, Oxford Borough, East Nottingham Township, West Nottingham Township, London Grove Township, West Grove Borough, Avondale Borough, Kennett Square Borough, South Coatesville Borough, Modena Borough, West Chester Borough, and Malvern Borough.



Figure 4.3.5-1. Chester County Pipelines



Source: Chester County Planning Commission 2013





4.3.5.2 Range of Magnitude

The Pipeline and Hazardous Materials Safety Administration (PHMSA) classifies pipeline incidents into the following categories: Gas Distribution, Gas Gathering, Gas Transmission, and Liquefied Natural Gas (LNG). Pipeline incidents within Chester County could range from minor leaks to a large explosion that could lead to loss of life and damage to property, environment, and economy. Severity of an incident varies depending on the type of material released, and distance and related response time for emergency response teams. Areas closest to the release sites are generally at the greatest risk; however, depending on the material, a release can travel great distances or persist over a long period of time resulting in far-reaching effects on people and the environment.

The worst-case scenario would be a large, uncontrolled release of a toxic gas or liquid from a pipeline or pump station within a major urban area. Physical property damage to private wells and public water systems is likely from this type of event, the potential for injury and death to people up to 0.25 mile from the scene is significant. This type of event would likely overwhelm the medical care capacity within the county, and possibly the region. Businesses nearby could close, and households could potentially be displaced.

4.3.5.3 Past Occurrence

The county has experienced pipeline accidents. For most incidents, municipal police departments and county emergency dispatchers are contacted for emergency response. The county's Hazardous Materials Response Team is contacted for technical advice about addressing the hazardous material. Between 2000 and 2019, a total of 311 pipeline incidents have occurred, resulting in 20 fatalities, 58 injuries, and \$210,050,876 in damages in the state of Pennsylvania (PHMSA 2020).

One significant incident occurred in West Goshen Township at a pump station on August 5, 2019. Pipeline experts state vapor buildup likely led to an explosion at a Sunoco Pipeline pump station. Independent pipeline experts say the explosion appeared to have been caused by relighting of a pilot in a flare for burning off excess gases at a time when vapor had accumulated. In a report developed for the township, responders concluded that Sunoco exceeded federal safety requirements in the plans for the pumping station. Local residents reported that the explosion shook their house (Hurdle 2019).

Another significant incident took place in West Whiteland and Uwchlan Townships in July 2017, where several households complained about access to their private well water being interrupted or being cloudy. Sunoco Pipeline LP suspended installation of its contentious Mariner East 2 underground pipeline near Exton. Some families had to stay in hotels for the rest of the week and several families were provided bottled water. Local officials suspected that non-toxic bentonite clay used as a lubricant during the horizontal-drilling process may have migrated into private wells (Maykuth 2017).

In June 2018, Sunoco pipeline spilled 33,500 gallons of gas into Darby Creek. Sunoco installed a new 12-inch line that would temporarily carry gas liquids, which was the same line that leaked gasoline in a creek near Philadelphia International Airport. The company said the stretch of pipeline that was converted runs between Wallace and Middletown Townships, a distance of about 25 miles (Hurdle 2018).

4.3.5.4 Future Occurrence

Because of the wide scope of definition of pipeline incidents, ranging from a small spill to a large release of a highly volatile or toxic hazmat, incidents can happen at any time, and will occur in the future. Transportation of hazmats via pipelines cross streams within the watersheds that are part of the county's domestic water supply.

While pipeline incidents in Chester County have occurred in the past, future incidents are generally considered difficult to predict. Although the county does not anticipate severe releases on any regular basis, the possibility of a significant release should not be discounted. Based on Risk Factor Methodology Probability Criteria, the likelihood of future occurrences within Chester County remains *highly likely*.



4.3.5.5 Vulnerability Assessment

To understand risk, a community must evaluate assets exposed or vulnerable within the identified hazard area. Effects of and risk from pipelines are examined. The following sections evaluate and estimate potential impacts in Chester County:

- Overview of vulnerability
- Impacts on (1) life, health, and safety; (2) general building stock; (3) critical facilities, (4) the economy, and (5) the environment
- Cascading effect on other hazards
- Future growth and development

Overview of Vulnerability

Pipelines within the Commonwealth of Pennsylvania are regulated by several different agencies. Although Chester County has no regulatory authority over pipeline operators, the county can be engaged in the environmental review of proposals and coordinating emergency services response. Some of the county-level departments involved include the Planning Commission, Water Resources Authority, Conservation District, Facility and Parks, and Department of Emergency Services. Federal and state agencies involved in pipeline safety and regulations include the following:

- Federal Emergency Regulatory Commission (FERC) is an independent agency of the United States government that regulates the interstate transmission of electricity, natural gas, and oil, and reviews proposals to build LNG terminals and interstate natural gas pipelines.
- U.S. Department of Transportation (USDOT) oversees the safety of pipelines and transportation infrastructure.
- Pipeline and Hazardous Materials Safety Administration (PHMSA) develops and enforces regulations for a safe, reliable, and environmentally sound pipeline transportation system.
- Public Utility Commission (PUC) enforces safety standards for pipeline facilities.
- Pennsylvania Department of Environmental Protection (PADEP) has regulatory authority over any crossing of a wetland or waterway by a pipeline. Pipeline projects located within Delaware River Basin may be subject to regulatory review by the Delaware River Basin Commission (DRBC).
- Many municipal governments are authorized to enact zoning and subdivision regulations to regulate the siting and environmental impact of pipelines (Chester County Planning Commission 2013).

Impact on Life, Health, and Safety

Pipeline hazards exert the greatest impact on the residential population in Chester County (Table 4.3.5-1 summarizes population vulnerable to pipeline hazards). Several incidents reported in the county are related to liquid and gas leaks from pump stations and pipelines. The Township of Uwchlan has the greatest number of residents in the pipeline hazard area, with a total of 17,797 people. First responders are also greatly impacted as well. Their safety may be at risk during on-scene operations and they may need to perform additional responsibilities such as traffic control. There is a potential for a higher than normal call volume/demand for first responders and they may have a difficult time responding to incidents due to limited access to roads and damaged infrastructure.

Table 4.3.5-1. Estimated Chester County Population Vulnerable to Pipeline Hazards

Jurisdiction	Total Population	Within 0.5 Mile of a Pipeline	
		Number	Percent Total
Atglen (B)	1,459	1,074	73.6%
Avondale (B)	1,295	0	0.0%
Birmingham (Twp)	4,207	551	13.1%
Caln (Twp)	14,198	9,069	63.9%



Section 4.3.5: Risk Assessment – Environmental Hazards – Oil and Natural Gas Pipelines

Jurisdiction	Total Population	Within 0.5 Mile of a Pipeline	
		Number	Percent Total
Charlestown (Twp)	5,813	4,209	72.4%
Coatesville (C)	13,147	8	0.1%
Downingtown (B)	7,929	2,012	25.4%
East Bradford (Twp)	9,959	593	6.0%
East Brandywine (Twp)	8,416	4,990	59.3%
East Caln (Twp)	4,876	3,502	71.8%
East Coventry (Twp)	6,770	1,511	22.3%
East Fallowfield (Twp)	7,567	485	6.4%
East Goshen (Twp)	18,199	16,361	89.9%
East Marlborough (Twp)	7,326	455	6.2%
East Nantmeal (Twp)	1,723	444	25.8%
East Nottingham (Twp)	8,929	0	0.0%
East Pikeland (Twp)	7,331	4,933	67.3%
East Vincent (Twp)	10,603	6,570	62.0%
East Whiteland (Twp)	7,062	5,204	73.7%
Easttown (Twp)	11,415	1,675	14.7%
Elk (Twp)	1,786	725	40.6%
Elverson (B)	1,405	1,104	78.6%
Franklin (Twp)	4,506	2,154	47.8%
Highland (Twp)	1,370	264	19.3%
Honey Brook (B)	1,865	0	0.0%
Honey Brook (Twp)	8,205	3,956	48.2%
Kennett (Twp)	8,177	1,929	23.6%
Kennett Square (B)	6,159	0	0.0%
London Britain (Twp)	3,241	1,012	31.2%
London Grove (Twp)	2,450	0	0.0%
Londonderry (Twp)	8,615	5,217	60.6%
Lower Oxford (Twp)	5,058	712	14.1%
Malvern (B)	3,440	218	6.3%
Modena (B)	873	0	0.0%
New Garden (Twp)	12,111	4,661	38.5%
New London (Twp)	1,312	221	16.8%
Newlin (Twp)	5,921	1,224	20.7%
North Coventry (Twp)	7,996	2,844	35.6%
Oxford (B)	5,420	0	0.0%
Parkesburg (B)	3,781	932	24.6%
Penn (Twp)	5,511	1,357	24.6%
Pennsbury (Twp)	3,649	644	17.6%
Phoenixville (B)	16,815	4,018	23.9%
Pocopson (Twp)	4,838	1,351	27.9%
Sadsbury (Twp)	3,919	1,934	49.3%
Schuylkill (Twp)	8,639	3,767	43.6%
South Coatesville (B)	1,276	0	0.0%
South Coventry (Twp)	2,631	255	9.7%
Spring City (B)	3,320	985	29.7%
Thornbury (Twp)	3,181	301	9.5%
Tredyffrin (Twp)	29,481	8,268	28.0%
Upper Oxford (Twp)	2,518	646	25.7%
Upper Uwchlan (Twp)	11,509	10,330	89.8%
Uwchlan (Twp)	18,869	17,797	94.3%
Valley (Twp)	7,661	4,271	55.7%
Wallace (Twp)	3,678	2,664	72.4%
Warwick (Twp)	2,543	203	8.0%
West Bradford (Twp)	12,869	7,847	61.0%
West Brandywine (Twp)	7,482	3,436	45.9%
West Caln (Twp)	9,080	2,722	30.0%



Section 4.3.5: Risk Assessment – Environmental Hazards – Oil and Natural Gas Pipelines

Jurisdiction	Total Population	Within 0.5 Mile of a Pipeline	
		Number	Percent Total
West Chester (B)	19,888	0	0.0%
West Fallowfield (Twp)	2,596	28	1.1%
West Goshen (Twp)	23,021	12,085	52.5%
West Grove (B)	2,846	0	0.0%
West Marlborough (Twp)	771	138	17.9%
West Nantmeal (Twp)	1,999	1,167	58.4%
West Nottingham (Twp)	2,718	0	0.0%
West Pikeland (Twp)	4,069	2,064	50.7%
West Sadsbury (Twp)	2,393	1,548	64.7%
West Vincent (Twp)	5,257	2,577	49.0%
West Whiteland (Twp)	18,403	11,598	63.0%
Westtown (Twp)	10,916	5,170	47.4%
Willistown (Twp)	10,895	4,536	41.6%
Chester County (Total)	517,156	204,525	39.5%

Sources: U.S. Census 2018; Chester County Geographic Information System (GIS) 2020; National Pipeline Mapping System 2017
 Notes: % = Percent; B = Borough; C = City; Twp = Township

Impacts on General Building Stock

While buildings may be present within the hazard area, estimating direct damage to these structures and facilities would be difficult. Potential losses may include contamination and/or potential structural and content losses if an explosion occurs. To estimate the buildings exposed to a pipeline event, the half-mile buffer areas were overlaid upon the building level. The replacement cost value of the structures with their center in the buffer areas were totaled (Table 4.3.5-2). The Township of Uwchlan has the greatest number of buildings and the greatest replacement cost values that would be impacted by a pipeline event. However, if a pipeline release were to occur, the incident would not be located along all pipelines in the county, but instead only a section of the total pipeline exposure area. Therefore, the total exposure does not represent a complete vulnerability, should a hazard event occur.

Table 4.3.5-2. Total Building Exposed to a Pipeline Incident

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	With 0.5 Mile of a Pipeline			
			Number of Buildings	Percent of Total	RCV (Replacement Cost Value)	Percent Total
Atglen (B)	583	\$300,171,233	436	74.8%	\$232,623,618	77.5%
Avondale (B)	436	\$275,491,131	0	0.0%	\$0	0.0%
Birmingham (Twp)	1,774	\$1,521,752,088	235	13.2%	\$176,629,831	11.6%
Caln (Twp)	5,696	\$4,389,258,174	3,580	62.9%	\$2,587,525,346	59.0%
Charlestown (Twp)	2,655	\$2,334,124,537	1,949	73.4%	\$1,824,544,622	78.2%
Coatesville (C)	3,545	\$2,658,702,748	7	0.2%	\$28,492,994	1.1%
Downingtown (B)	2,619	\$2,678,308,815	624	23.8%	\$560,966,034	20.9%
East Bradford (Twp)	4,033	\$3,166,888,223	255	6.3%	\$186,210,606	5.9%
East Brandywine (Twp)	4,201	\$2,499,920,165	2,477	59.0%	\$1,304,802,700	52.2%
East Caln (Twp)	1,509	\$1,864,909,402	970	64.3%	\$659,800,023	35.4%
East Coventry (Twp)	3,832	\$2,200,926,728	935	24.4%	\$601,431,762	27.3%
East Fallowfield (Twp)	4,025	\$1,984,687,476	319	7.9%	\$182,408,390	9.2%
East Goshen (Twp)	6,498	\$5,680,635,001	5,836	89.8%	\$5,005,377,300	88.1%





Section 4.3.5: Risk Assessment – Environmental Hazards – Oil and Natural Gas Pipelines

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	With 0.5 Mile of a Pipeline			
			Number of Buildings	Percent of Total	RCV (Replacement Cost Value)	Percent Total
East Marlborough (Twp)	3,888	\$3,646,563,821	341	8.8%	\$242,133,936	6.6%
East Nantmeal (Twp)	1,509	\$1,131,945,456	341	22.6%	\$227,041,273	20.1%
East Nottingham (Twp)	4,960	\$3,185,167,607	0	0.0%	\$0	0.0%
East Pikeland (Twp)	3,959	\$2,751,413,608	2,671	67.5%	\$1,880,779,690	68.4%
East Vincent (Twp)	3,872	\$2,764,012,516	2,350	60.7%	\$1,482,457,302	53.6%
East Whiteland (Twp)	5,002	\$8,143,686,632	3,704	74.1%	\$5,194,240,730	63.8%
Easttown (Twp)	4,583	\$3,998,338,009	673	14.7%	\$606,903,373	15.2%
Elk (Twp)	1,361	\$754,193,647	559	41.1%	\$295,652,666	39.2%
Elverson (B)	716	\$516,332,051	556	77.7%	\$352,758,850	68.3%
Franklin (Twp)	2,468	\$1,537,535,450	1,156	46.8%	\$709,337,331	46.1%
Highland (Twp)	1,304	\$1,067,555,265	324	24.8%	\$281,585,711	26.4%
Honey Brook (B)	771	\$446,825,932	0	0.0%	\$0	0.0%
Honey Brook (Twp)	4,871	\$3,389,705,910	2,249	46.2%	\$1,379,154,898	40.7%
Kennett (Twp)	4,166	\$4,134,894,338	969	23.3%	\$839,029,482	20.3%
Kennett Square (B)	1,956	\$1,600,982,472	0	0.0%	\$0	0.0%
London Britain (Twp)	1,782	\$1,064,040,035	549	30.8%	\$284,588,930	26.7%
London Grove (Twp)	4,233	\$3,148,102,405	0	0.0%	\$0	0.0%
Londonderry (Twp)	1,755	\$1,034,199,367	1,016	57.9%	\$569,118,143	55.0%
Lower Oxford (Twp)	2,585	\$2,325,017,464	499	19.3%	\$414,593,211	17.8%
Malvern (B)	1,149	\$1,256,307,741	63	5.5%	\$73,382,681	5.8%
Modena (B)	226	\$143,886,459	0	0.0%	\$0	0.0%
New Garden (Twp)	5,418	\$5,996,313,471	1,839	33.9%	\$1,684,593,535	28.1%
New London (Twp)	2,955	\$1,850,994,293	542	18.3%	\$326,251,697	17.6%
Newlin (Twp)	1,188	\$767,919,221	272	22.9%	\$152,780,527	19.9%
North Coventry (Twp)	4,367	\$2,814,129,243	1,614	37.0%	\$1,419,825,344	50.5%
Oxford (B)	1,795	\$1,620,222,123	0	0.0%	\$0	0.0%
Parkesburg (B)	1,478	\$791,790,495	347	23.5%	\$185,561,765	23.4%
Penn (Twp)	2,962	\$3,335,917,017	952	32.1%	\$1,897,144,119	56.9%
Pennsbury (Twp)	1,793	\$1,741,030,601	359	20.0%	\$339,583,349	19.5%
Phoenixville (B)	6,031	\$4,404,373,172	1,383	22.9%	\$1,152,017,493	26.2%
Pocopson (Twp)	1,781	\$1,616,048,060	476	26.7%	\$480,587,472	29.7%
Sadsbury (Twp)	2,244	\$1,514,078,865	1,093	48.7%	\$939,693,219	62.1%
Schuylkill (Twp)	4,116	\$3,296,773,180	1,788	43.4%	\$1,358,411,568	41.2%
South Coatesville (B)	669	\$656,482,254	0	0.0%	\$0	0.0%
South Coventry (Twp)	1,655	\$1,175,837,157	144	8.7%	\$54,672,091	4.6%
Spring City (B)	1,282	\$913,935,869	384	30.0%	\$255,665,291	28.0%
Thornbury (Twp)	1,222	\$1,249,939,720	145	11.9%	\$335,876,666	26.9%



Section 4.3.5: Risk Assessment – Environmental Hazards – Oil and Natural Gas Pipelines

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	With 0.5 Mile of a Pipeline			
			Number of Buildings	Percent of Total	RCV (Replacement Cost Value)	Percent Total
Tredyffrin (Twp)	10,751	\$13,427,976,905	3,118	29.0%	\$5,257,635,098	39.2%
Upper Oxford (Twp)	2,098	\$1,327,197,078	512	24.4%	\$309,718,578	23.3%
Upper Uwchlan (Twp)	4,459	\$3,757,709,779	3,963	88.9%	\$3,282,538,070	87.4%
Uwchlan (Twp)	6,633	\$7,025,589,763	6,230	93.9%	\$6,281,759,021	89.4%
Valley (Twp)	3,430	\$2,597,377,442	1,901	55.4%	\$1,354,281,549	52.1%
Wallace (Twp)	2,069	\$1,322,743,721	1,506	72.8%	\$952,211,809	72.0%
Warwick (Twp)	2,175	\$1,133,542,100	176	8.1%	\$93,238,330	8.2%
West Bradford (Twp)	6,163	\$3,995,074,181	3,705	60.1%	\$2,098,488,191	52.5%
West Brandywine (Twp)	4,149	\$2,231,906,820	1,942	46.8%	\$1,182,598,337	53.0%
West Caln (Twp)	6,021	\$2,765,167,902	1,746	29.0%	\$722,804,248	26.1%
West Chester (B)	4,156	\$5,374,643,016	0	0.0%	\$0	0.0%
West Fallowfield (Twp)	2,171	\$1,743,066,295	32	1.5%	\$26,046,613	1.5%
West Goshen (Twp)	8,399	\$9,444,801,871	4,271	50.9%	\$3,873,467,194	41.0%
West Grove (B)	1,053	\$499,625,186	0	0.0%	\$0	0.0%
West Marlborough (Twp)	967	\$997,081,475	131	13.5%	\$87,099,079	8.7%
West Nantmeal (Twp)	1,830	\$1,139,858,316	1,095	59.8%	\$651,320,164	57.1%
West Nottingham (Twp)	1,989	\$1,196,217,005	0	0.0%	\$0	0.0%
West Pikeland (Twp)	2,120	\$1,506,034,830	1,082	51.0%	\$717,348,285	47.6%
West Sadsbury (Twp)	1,876	\$1,651,357,888	1,134	60.4%	\$854,961,633	51.8%
West Vincent (Twp)	3,532	\$2,587,356,437	1,738	49.2%	\$1,307,741,811	50.5%
West Whiteland (Twp)	7,022	\$7,660,221,171	4,460	63.5%	\$4,956,653,247	64.7%
Westtown (Twp)	4,175	\$3,282,102,771	1,989	47.6%	\$1,553,918,977	47.3%
Willistown (Twp)	6,043	\$4,727,817,226	2,446	40.5%	\$1,829,508,526	38.7%
Chester County (Total)	232,759	\$194,736,735,824	90,158	38.7%	\$76,159,574,329	39.1%

Sources: Chester County GIS 2020; RSMears 2019; National Pipeline Mapping System 2017
 Notes: % = Percent; B = Borough; C = City; Twp = Township

Impacts on Critical Facilities

Potential losses of critical facilities caused by a pipeline incident are difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs. Table 4.3.5-3 summarizes critical facilities and lifelines located within the pipeline buffer area. A total of 4,202 critical facilities are located in Chester County. Overall, 1,564 critical facilities are exposed to a pipeline event, and 1,037 of those facilities are considered lifelines.

Table 4.3.5-3. Number of Critical Facilities in Pipeline Incident Exposure

Jurisdictions	Number of Critical Facilities in Pipeline Incident Exposure (Lifelines)	Jurisdictions	Number of Critical Facilities in Pipeline Incident Exposure (Lifelines)
Atglen (B)	14 (11)	North Coventry (Twp)	33 (19)





Section 4.3.5: Risk Assessment – Environmental Hazards – Oil and Natural Gas Pipelines

Jurisdictions	Number of Critical Facilities in Pipeline Incident Exposure (Lifelines)	Jurisdictions	Number of Critical Facilities in Pipeline Incident Exposure (Lifelines)
Avondale (B)	0 (0)	Oxford (B)	0 (0)
Birmingham (Twp)	8 (8)	Parkesburg (B)	7 (3)
Caln (Twp)	56 (45)	Penn (Twp)	14 (9)
Charlestown (Twp)	53 (38)	Pennsbury (Twp)	12 (7)
Coatesville (C)	6 (6)	Phoenixville (B)	13 (11)
Downingtown (B)	13 (10)	Pocopson (Twp)	12 (9)
East Bradford (Twp)	10 (8)	Sadsbury (Twp)	24 (10)
East Brandywine (Twp)	26 (20)	Schuylkill (Twp)	24 (13)
East Caln (Twp)	8 (5)	South Coatesville (B)	0 (0)
East Coventry (Twp)	16 (13)	South Coventry (Twp)	3 (3)
East Fallowfield (Twp)	13 (11)	Spring City (B)	1 (1)
East Goshen (Twp)	59 (34)	Thornbury (Twp)	8 (7)
East Marlborough (Twp)	6 (5)	Tredyffrin (Twp)	119 (72)
East Nantmeal (Twp)	6 (6)	Upper Oxford (Twp)	4 (2)
East Nottingham (Twp)	0 (0)	Upper Uwchlan (Twp)	56 (42)
East Pikeland (Twp)	29 (20)	Uwchlan (Twp)	98 (43)
East Vincent (Twp)	39 (28)	Valley (Twp)	35 (24)
East Whiteland (Twp)	136 (78)	Wallace (Twp)	24 (21)
Easttown (Twp)	9 (4)	Warwick (Twp)	1 (1)
Elk (Twp)	2 (2)	West Bradford (Twp)	26 (17)
Elverson (B)	8 (4)	West Brandywine (Twp)	28 (24)
Franklin (Twp)	12 (8)	West Caln (Twp)	6 (3)
Highland (Twp)	6 (4)	West Chester (B)	0 (0)
Honey Brook (B)	0 (0)	West Fallowfield (Twp)	1 (1)
Honey Brook (Twp)	21 (11)	West Goshen (Twp)	69 (39)
Kennett (Twp)	21 (17)	West Grove (B)	0 (0)
Kennett Square (B)	0 (0)	West Marlborough (Twp)	7 (6)
London Britain (Twp)	8 (8)	West Nantmeal (Twp)	17 (12)
London Grove (Twp)	0 (0)	West Nottingham (Twp)	0 (0)
Londonderry (Twp)	16 (11)	West Pikeland (Twp)	28 (25)
Lower Oxford (Twp)	10 (9)	West Sadsbury (Twp)	24 (11)
Malvern (B)	0 (0)	West Vincent (Twp)	30 (26)
Modena (B)	0 (0)	West Whiteland (Twp)	145 (99)
New Garden (Twp)	19 (10)	Westtown (Twp)	14 (8)
New London (Twp)	9 (9)	Willistown (Twp)	33 (17)
Newlin (Twp)	9 (9)	Chester County (Total)	1,564 (1,037)



Sources: *Chester County GIS 2020; National Pipeline Mapping 2017*
Notes: % = Percent; B = Borough; C = City; Twp = Township

Impact on the Economy

Economic loss from pipeline incidents and explosion incidents ranges from non-recordable to losses exceeding millions of dollars. Impact on the local economy from a single incident is almost impossible to measure because of complexities of predicting losses of work, revenue, and future business. However, it is certain that a significant incident within an urban area would cause various economic losses. Pipeline incidents can lead to closures of major transportation routes. Waterway, railroad, airport, and highway closures caused by these incidents can hinder delivery of goods and services. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and the extent of disruptions to services. In 2019, Pennsylvania experienced 19 pipeline incidents, causing \$13.4 million in damages (PHMSA 2019).

Impact on the Environment

As discussed above, pipeline incidents and explosion incidents can profoundly affect the surrounding environment. Contamination of soil, surface water, and groundwater can result in many direct impacts on surrounding populations and ecosystems. When a large volume of product is released, much of it remains unrecovered as product disperses into the environment (Belvederesi, et al 2018). This can have an immense and lasting impact on the local flora and fauna.

Cascading Impacts to Other Hazards

Pipeline events can cause utility failure. If a spill or other release occurred, water quality and supply could stop or drastically decrease while the facility restored service. Pipeline incidents also have the potential to start fires. For instance, in 2019, there were 66 fires in the United States that resulted from a gas distribution pipeline incident (PHMSA 2019). These fires could potentially spread, causing other structural fires. Section 4.3.14, Structural Fires, and Section 4.3.18, Utility Interruption, provide additional information.

Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors when examining potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Any areas of growth could be impacted by pipeline hazards if located within identified hazard areas. Additionally, an increase in development and population can increase the likelihood of a pipeline incident. The tables and hazard maps included in the jurisdictional annexes in this HMP contain additional information regarding the specific areas of development that would increase county vulnerability to the hazmat incident hazard.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicates that Chester's population will continue to increase into 2040, increasing total population to approximately 603,068 persons (Center of Rural Pennsylvania 2013). Persons that move into pipeline exposure areas are at greater risk to be impacted in the event of a gas or oil release.



Climate Change

No immediate climate change impacts are associated with the hazard.

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also established using RSMeans 2020 building valuations that estimated replacement cost value for each building in the inventory. Additionally, a critical facility dataset was provided from the county. Overall, exposure and vulnerability of the entire county to pipeline incidents will continue.



4.3.6 Extreme Temperature

This section provides a profile and vulnerability assessment of the extreme temperature hazard in Chester County. Extreme temperature includes both heat and cold events, which can have a significant impact to human health, commercial/agricultural businesses and primary and secondary effects on infrastructure (e.g., burst pipes and power failure). What constitutes “extreme cold” or “extreme heat” can vary across different areas of the country based on the conditions the population is accustomed to.

Extreme cold events are when temperatures drop well below normal in an area. In regions relatively unaccustomed to winter weather, near-freezing temperatures are considered “extreme cold.” Extreme cold temperatures are generally characterized in temperate zones by the ambient air temperature dropping to approximately 0°F or below (Centers for Disease Control and Prevention [CDC] 2013). Extremely cold temperatures often accompany a winter storm, which can cause power failures and icy roads. Although staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, individuals may also face indoor hazards. Many homes will be too cold—either due to a power failure or because the heating system is not adequate for the weather. The use of space heaters and fireplaces to keep warm increases the risk of household fires and carbon monoxide poisoning (CDC 2007).

Conditions of extreme heat are defined as summertime temperatures that are substantially hotter and/or more humid than average for a location at that time of year (CDC 2009). An extended period of extreme heat of three or more consecutive days is typically called a heat wave and is often accompanied by high humidity (National Weather Service [NWS] 2005). “Heat wave” has no universal definition because the term is relative to the usual weather in a particular area. The term heat wave is applied both to routine weather variations and to extraordinary spells of heat that may occur only once per century (Meehl and Tebaldi 2004). A basic definition of a heat wave implies that it is an extended period of unusually high atmosphere-related heat stress, which causes temporary modifications in lifestyle and which may have adverse health consequences for the affected population (Robinson 2013). A heat wave is defined as three consecutive days of temperatures $\geq 90^{\circ}\text{F}$.

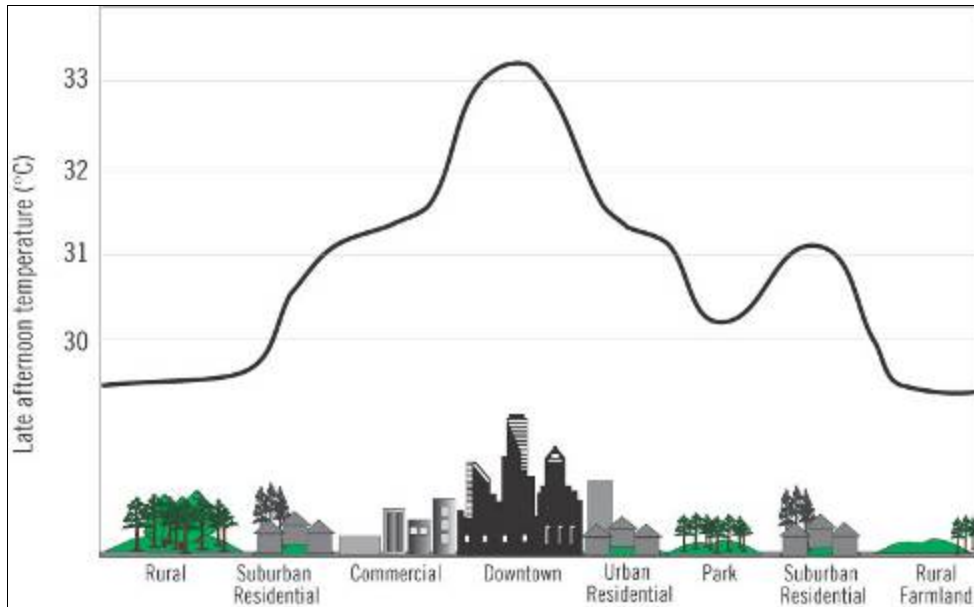
Extreme heat is the number one weather-related cause of death in the United States. In a 30-year average of weather fatalities across the nation from 1988 to 2017, excessive heat claimed more lives each year than floods, lightning, tornadoes, and hurricanes. In 2017, heat claimed 107 lives nationally, with no fatalities occurring in Pennsylvania (NWS 2018).

The term “heat island” describes built-up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with more than 1 million people can be between 1.8 °F and 5.4°F warmer than its surrounding areas. In the evening, the difference in air temperatures can be as high as 22°F. Heat islands occur on the surface and in the atmosphere. On a hot, sunny day, the sun can heat dry, exposed urban surfaces to temperatures 50°F to 90°F hotter than the air. Heat islands can affect communities by increasing peak energy demand during the summer, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and death, and water quality degradation (EPA 2010 and 2011).

Figure 4.3.6-1 below illustrates an urban heat island profile. The graphic demonstrates that heat islands are typically most intense over dense urban areas. Further, vegetation and parks within a downtown area may help reduce heat islands (U.S. EPA 2019).



Figure 4.3.6-1. Urban Heat Island Profile



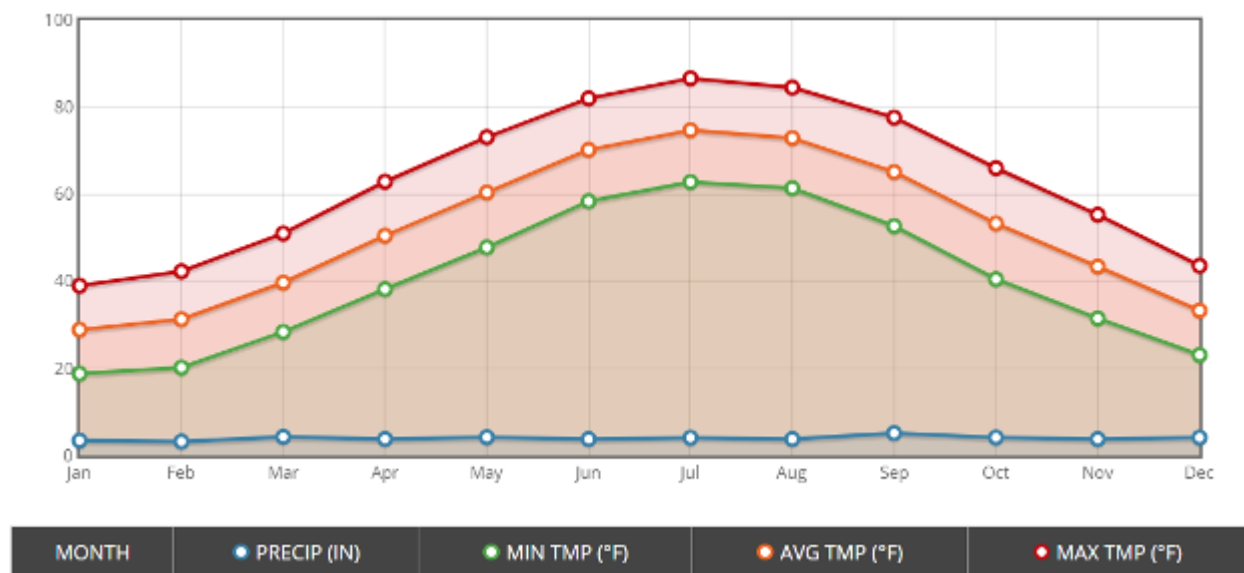
Source: EPA 2019
°C degrees Celsius

4.3.6.1 Location and Extent

Location

Chester County is susceptible to extreme temperatures in the summer and winter seasons, and they can occur anywhere in the county. The average low temperature in January is 17°F, and the average high temperature in July is 84°F (U.S. Climate Data 2020). Average minimum temperatures in Chester County ranged from 40°F to 45°F, and average maximum temperatures range from 60°F to 65°F (Figure 4.3.6-2) (NOAA-NCEI, 2020).

Figure 4.3.6-2. Average Temperatures at West Chester 2 NW PA, US



Source: NOAA-NCEI 2020



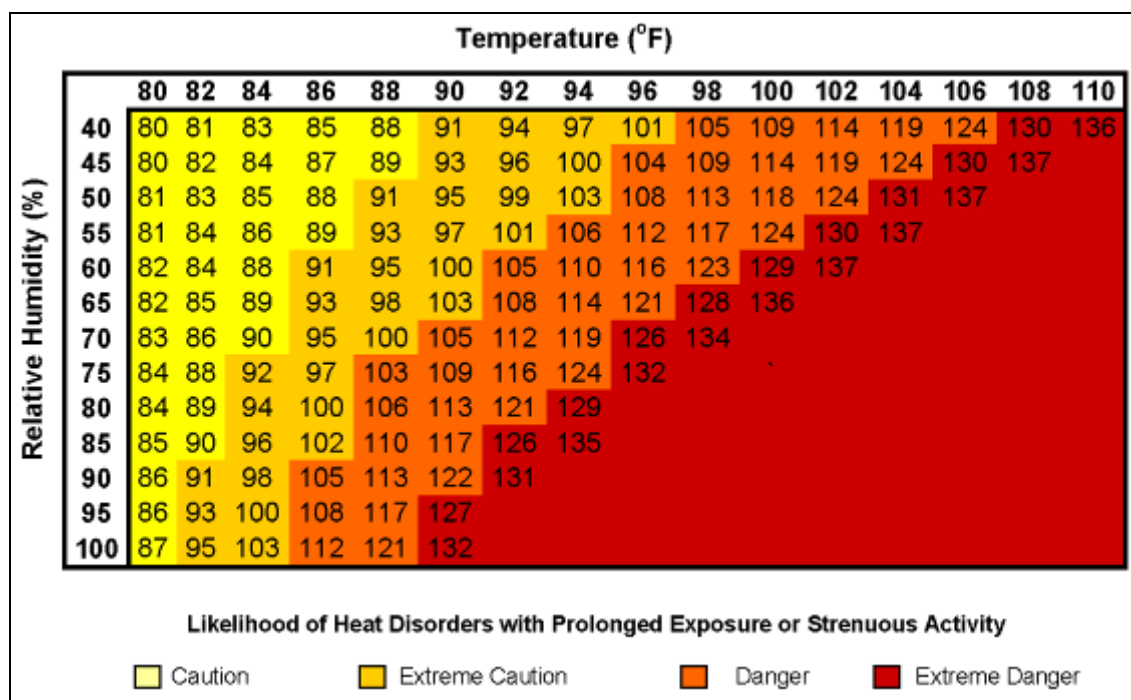


Extent

Extreme Heat

NOAA’s heat alert procedures are based mainly on heat index values. The heat index is given in degrees Fahrenheit. The heat index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. To find the heat index temperature, the temperature and relative humidity need to be known. Once both values are known, the heat index will be the corresponding number with both values (Figure 4.3.6-3). The heat index indicates the temperature the body feels. It is important to know that the heat index values are devised for shady, light wind conditions. Exposure to full sunshine can increase heat index values by up to 15°F. Strong winds, particularly with very hot dry air, can also be extremely hazardous (NWS 2013).

Figure 4.3.6-3. NWS Heat Index Chart



Source: NWS 2015
 °F degrees Fahrenheit
 % percent

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures is generally measured through the wind chill temperature (WCT) index. Wind chill temperature is the temperature that people and animals feel when outside, and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin’s temperature to drop (NWS, n.d.).

On November 1, 2001, the NWS implemented a new WCT index. It was designed to calculate how cold air feels on human skin more accurately. The table below shows the new WCT index. The WCT index includes a frostbite indicator, showing points where temperature, wind speed, and exposure time will produce frostbite to humans. Figure 4.3.6-4 shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops (NWS, n.d.).



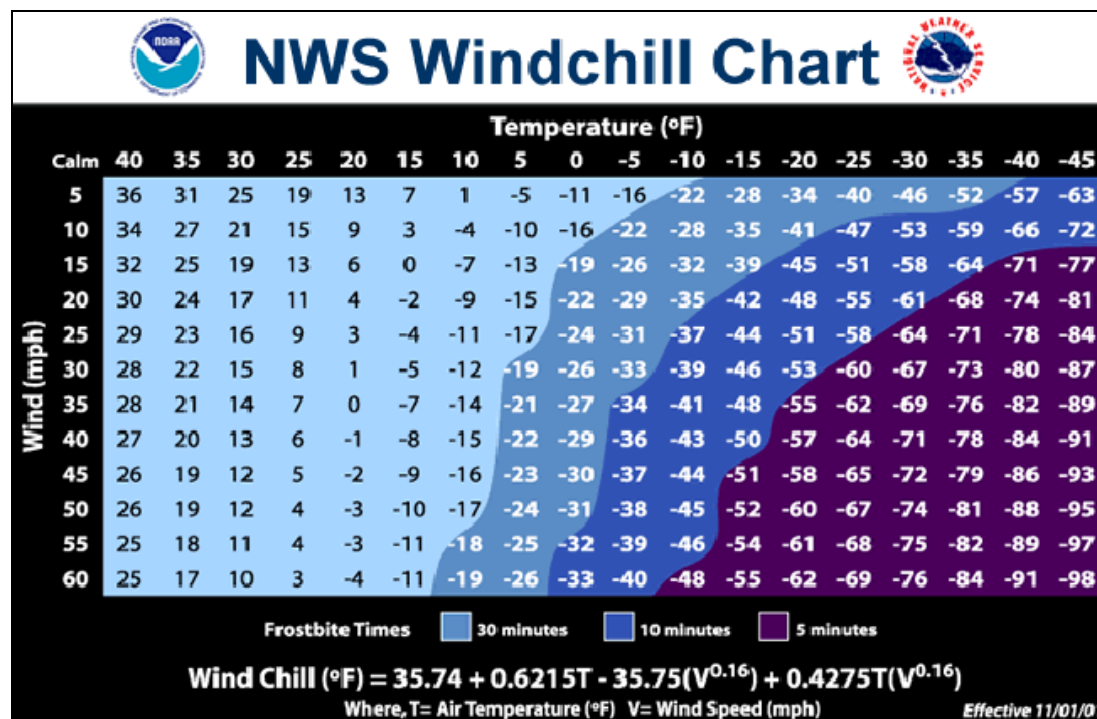


In Pennsylvania, wind chill warnings are issued when wind chills drop to -25°F or lower. While this threshold applies to the entire state, the threshold for advisories vary based on regions. Wind chill advisories are issued in the southeast and western sections of Pennsylvania when wind chill values drop to -10°F. South-central to northern sections of the Commonwealth when wind chills drop to -15°F (Pennsylvania Emergency Management Agency [PEMA] 2018).

The NWS issues the nation’s Freeze Watch, Warning, and Frost Advisory:

- Hard Freeze Warning: NWS issues a hard freeze warning when temperatures are expected to drop below 28°F for an extended period of time, killing most types of commercial crops and residential plants.
- Freeze Warning: When temperatures are forecasted to go below 32°F for a long period of time, NWS issues a freeze warning. This temperature threshold kills some types of commercial crops and residential plants.
- Freeze Watch: NWS issues a freeze watch when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours. A freeze watch is issued in the autumn until the end of the growing season and in the spring at the start of the growing season.
- Frost Advisory: A frost advisory means areas of frost are expected or occurring, posing a threat to sensitive vegetation (NWS 2019).

Figure 4.3.6-4. NWS Wind Chill Index



Source: NWS, n.d.
°F degrees Fahrenheit
mph miles per hour



4.3.6.2 Range of Magnitude

Extreme temperatures can cause a range of impacts to communities that include health impacts, transportation, agriculture, and energy. Meteorologists can accurately forecast extreme temperature event development and the severity of the associated conditions with several days lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations.

For heat events, the NWS issues excessive heat outlooks when the potential exists for an excessive heat event in the next 3 to 7 days. Watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. Excessive heat warning/advisories are issued when an excessive heat event is expected in the next 36 hours (NWS 2013). Winter temperatures may fall to extreme cold readings with no wind occurring. Currently, the only way to headline very cold temperatures is with the use of the NWS-designated wind chill advisory or warning products. When actual temperatures reach wind chill warning criteria with little to no wind, extreme cold warnings may be issued (NWS, n.d.).

Cold temperatures can be extremely dangerous to humans and animals exposed to the elements. Without heat and shelter, cold temperatures can cause hypothermia, frost bite, and death. Wind chill temperatures are often used in place of raw temperature values because of wind can have in drawing heat from the body under cold temperatures. These values represent what temperatures actually feel like to humans and animals under cold, windy conditions. Similar to high temperatures, the effect of cold temperatures will vary by individual (PEMA 2018).

Extremely high temperatures cause heat stress, which can be divided into four categories (Table 4.3.6-1). Each category is defined by apparent temperature, which is associated with a heat index value that captures the combined effects of dry air temperature and relative humidity on humans and animals. Major human risks for these temperatures include heat cramps, heat syncope, heat exhaustion, heatstroke, and death. Although the figure below serves as a guide for various danger categories, the impacts of high temperatures will vary from person to person based on age, health, and other factors. The elderly and very young are most vulnerable to health-related impacts of extreme temperatures (PEMA 2018).

Table 4.3.6-1. Adverse Effects of Prolonged Exposure to Heat on Individuals

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heatstroke/sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Heatstroke/sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Heatstroke/sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

Source: NWS 2009

4.3.6.3 Past Occurrence

Many sources provided historical information regarding previous occurrences and losses associated with extreme temperature events throughout Chester County. With so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.



Based on data from the Midwestern Regional Climate Center (MRCC), Table 4.3.6-2 presents the number of extreme cold (minimum) and hot (maximum) temperature records for the weather stations located in Chester County between 1950 and June 2020.

Table 4.3.6-2. Number of Days with a Recorded Extreme Temperature (1950-2020)

NWS Station	# Days Above 90°F (Hot)	# Days Below 0°F (Cold)
Charleroi Lock 4	126	25
Derry 4 SW	483	229
Donegal 2 NW	165	499
Irwin	185	12
Laurel Mountain	24	215
Mount Pleasant	91	36
Murrysville 2 SW	168	39
New Stanton 1 SW	389	93
Rector 3 SSW	294	312
Salina 3 W	606	422
Average	253.1	188.2

Source: MRCC 2019

Note: There may be some potential problems with the data collected at the stations. The values of the all-time records for stations with brief histories are limited in accuracy and could vary from nearby stations with longer records. Although the data sets have been through quality control, there is still a need for more resources to quality control extremes. The record sets are for single stations in the cooperative observer network and are limited to the time of operation of each station under one coop number. The records for a place may need to be constructed from several individual station histories. Some of the data may vary from NWS records due to NWS using multiple stations and additional sources like record books (MRCC, n.d.).

Between 1954 and 2019, Pennsylvania has not been included in major disaster (DR) or emergency (EM) declarations as a result of extreme temperatures (FEMA 2019). Agriculture-related disaster declarations are quite common. One-half to two-thirds of the counties in the United States have been designated as disaster areas in each of the past several years. The U.S. Department of Agriculture (USDA) Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2012 and 2018, Pennsylvania has been included in 26 USDA declarations related to extreme temperatures. Chester County has not been included in these declarations.

Table 4.3.6-3 summarizes extreme temperature events that occurred in Chester County. Between 1950 and 2019, Chester County has experienced 19 extreme temperature events (National Oceanic and Atmospheric Administration National Centers for Environmental Information [NOAA-NCEI] 2020). However, details for all events were not readily available. As stated above, many sources were researched for historical information regarding extreme temperature events; however, the table below is not inclusive of every extreme temperature event that has impacted Chester County.

Table 4.3.6-3. Extreme Temperature Events in Chester County, 2015 to 2020

Date(s) of Event	Event Type	Description
January 7-8, 2015	Cold/Wind Chill	An arctic air mass crossed into most of eastern Pennsylvania, bringing record-low morning temperatures and extreme wind chills. In Chester County, a low temperature of -5°F with a wind chill of -25°F was recorded.
February 13, 2015	Cold/Wind Chill	A strong arctic air mass-produced wind chill factors as low as -25°F in the Poconos and -10-15°F in eastern Pennsylvania. Many counties declared Code Blues. Temperatures were reported in Chester County -12°F.
February 15, 2015	Cold/Wind Chill	A combination of strong to high winds and an arctic air mass-produced wind chill factors as low as -25°F in the Poconos and -15-20°F in eastern Pennsylvania during



Date(s) of Event	Event Type	Description
		the morning of February 15. Many municipalities declared Code Blues. Pipes froze, shelters were full, and some oil lines were freezing. Temperatures were recorded in Chester County as low as 7°F.
February 19-20, 2015	Cold/Wind Chill	An arctic air mass and wind chills caused temperatures to drop to -35°F in the Poconos and -20°F elsewhere in Pennsylvania during the morning. Code Blue emergencies were declared throughout the Philadelphia Metropolitan area. In Chester County, temperatures were reported as low as -22°F.
February 24, 2015	Cold/Wind Chill	A high-pressure system arrived the morning of February 24. Temperatures were recorded in the Poconos at -25°F in the morning and 2°F in Chester County.
June 23, 2015	Heat	Unseasonably hot and humid weather occurred across southeast Pennsylvania on June 23 with high temperatures reaching into the lower 90s and afternoon indices of around 100°F. Temperatures in Chester County was recorded at 93°F.
July 19–20 2015	Excessive Heat	Unseasonably hot and humid weather affected most of eastern Pennsylvania. High temperatures both days reached into the lower 90s. July 19 was slightly hotter and had some of the highest heat indices of the summer. Many counties opened cooling centers to combat the heat. Temperatures were as high as 94°F in Chester County.
February 14, 2016	Cold/Wind Chill	Bitter cold temperatures and strong northwest winds associated with an arctic outbreak combined to create dangerous wind chill temperatures across the entire northeast quadrant of the county beginning on February 13 and lasting into the afternoon of February 14. Temperatures were recorded as low as 2°F.
July 1-3, 2018	Excessive Heat	Temperatures in the middle to upper 90s and dew points in the upper 60s to lower 70s led to excessive heat across portions of southeastern Pennsylvania. Heat indices reached 105 °F at the Chester County Airport ASOS on July 3.

Sources: NOAA-NCEI 2020

4.3.6.4 Future Occurrence

Extreme temperature events occur each year throughout Chester County. It is estimated that the county will continue to experience temperature extremes annually that may induce secondary hazards such as potential snow, hail, ice or windstorms, thunderstorms, drought, human health impacts, utility failures, and transportation accidents.

For the 2020 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of extreme temperature events for Chester County. Information from NOAA-NCEI storm events database and MRCC were used to identify the number of extreme temperature events that occurred between 1950 and 2020. Using these sources ensures the most accurate probability estimates possible. Table 4.3.6-4 shows these statistics as well as the annual average number of events and the estimate percent chance of an incident occurring in a given year. Based on these statistics, there is an estimated 27 percent chance of an extreme temperature event occurring in any given year in Chester County.

Table 4.3.6-4. Probability of Future Extreme Temperature Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Extreme Temperature	19	0.28	3.68	0.27	27%

Sources: NOAA-NCEI 2020; MRCC 2020

Based on available historical data, the future occurrence of extreme temperatures can be considered *possible* as defined by the Risk Factor Methodology probability criteria (Section 4.4).



4.3.6.5 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the extreme temperature events, the entire county has been identified as the hazard area. Therefore, all assets in the county (population, structures, critical facilities, and lifelines), as described in the County Profile (Section 2), are vulnerable. The following text evaluates and estimates the potential impact of extreme temperatures on Chester County including:

- Overview of vulnerability
- Impact on (1) life, health, and safety of residents; (2) general building stock; (3) critical facilities; (4) economy; (5) the environment; and (6) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding of this hazard over time

Overview of Vulnerability

Extreme temperatures generally occur for a short period of time but can cause a range of impacts, particularly to vulnerable populations that may not have access to adequate cooling or heating. This natural hazard can also cause impacts to agriculture (crops and animals), infrastructure (for example, through pipe bursts associated with freezing or power failure), and the economy.

Impact on Life, Health, and Safety

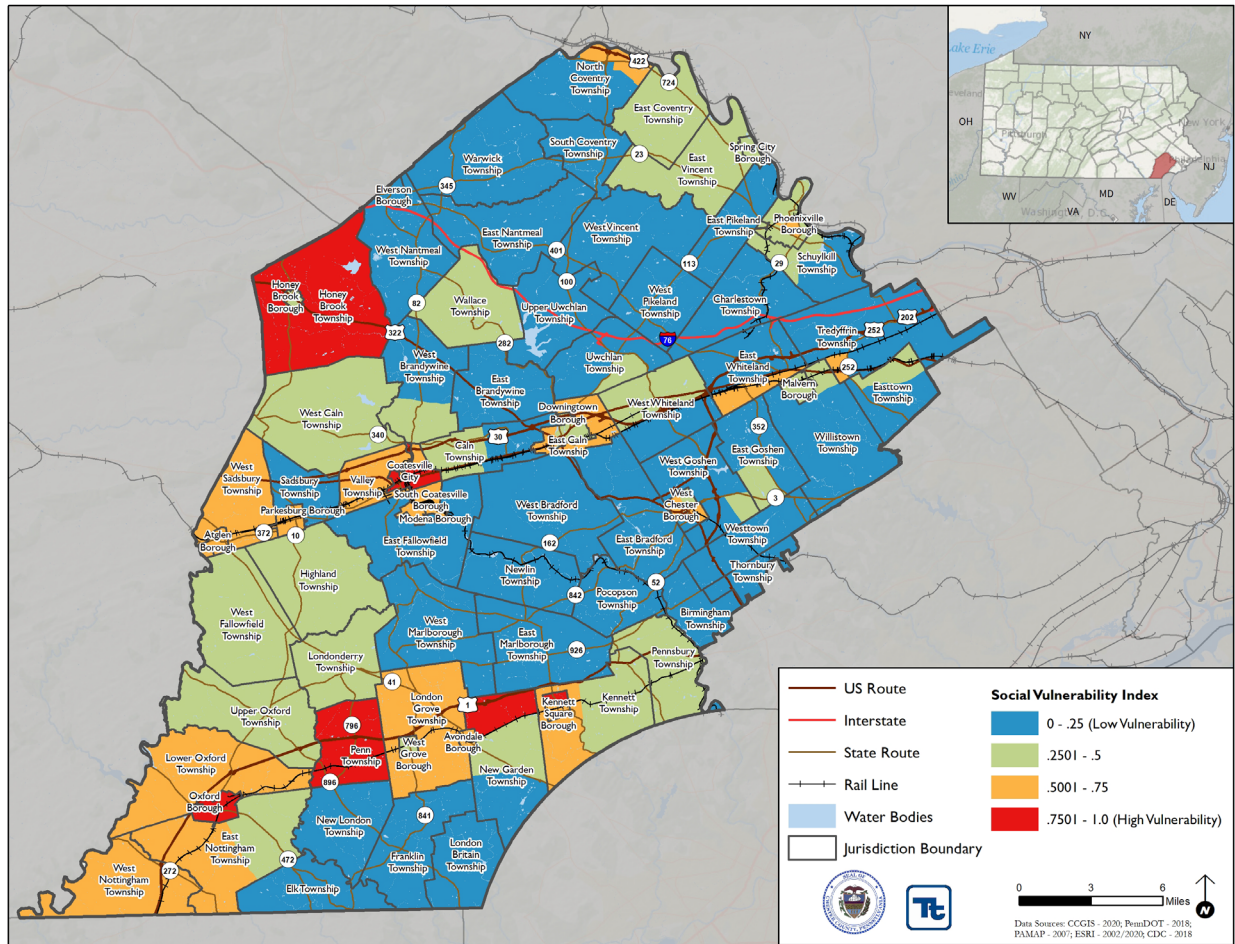
For the purposes of this HMP, the entire population of Chester County is considered exposed to extreme temperature events. The County Profile (Section 2) of this HMP provides population statistics regarding each participating municipality and a summary of the more vulnerable populations (over the age of 65 and individuals living below the U.S. Census poverty threshold). According to the CDC, populations most at risk to extreme cold and heat events include the following: (1) the elderly, who are less able to withstand temperature extremes due to their age, health conditions, and limited mobility to access shelters; (2) infants and children up to 4 years of age; (3) individuals with chronic medical conditions (e.g., heart disease, high blood pressure); (4) low-income persons that cannot afford proper heating and cooling; and (5) the general public who may overexert during work or exercise during extreme heat events or experience hypothermia during extreme cold events (CDC 2017a).

According to the 2018 ACS 5-Year Population Estimate, 15.4 percent of the population in Chester County is 65 and over. In Chester County, the boroughs and cities have the highest concentration of elderly population with densities decreasing outward into the surrounding townships. Section 2 (County Profile) displays the densities of populations over 65 in Chester County. People experiencing homelessness and residents with low incomes may not have access to housing or their housing may be less able to withstand extreme temperatures (e.g., homes with poor insulation and heating supply or poor cooling systems). Section 2 (County Profile) also displays the densities of low-income populations in Chester County.

According to CDC’s 2016 Social Vulnerability Index, the most vulnerable populations are located within the following municipalities: Honey Brook Borough, Honey Brook Township, Oxford Borough, South Coatesville Borough, and Kennett Square Borough. The vulnerable population located in these municipalities may be more susceptible to impacts from extreme temperatures. Figure 4.3.6-5 below displays the CDC 2018 Social Vulnerability Index by Census Tract for Chester County.



Figure 4.3.6-5. CDC’s Social Vulnerability Index by Tract, 2018



Meteorologists can accurately forecast extreme heat event development and the severity of the associated conditions with several days of lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations, implement short-term emergency response actions and focus on surveillance and relief efforts on those at greatest risk. Adhering to extreme temperature warnings can significantly reduce the risk of temperature-related deaths.

Impact on General Building Stock

All the building stock in the county is exposed to the extreme temperature hazard. Refer to Section 2, which summarizes the building inventory in Chester County. Extreme heat generally does not impact buildings. Losses may be associated with the overheating of heating, ventilation, and air conditioning (HVAC) systems. Extreme cold temperature events can damage buildings through freezing/bursting pipes and freeze/thaw cycles. Additionally, manufactured homes (mobile homes) and antiquated or poorly constructed facilities may have inadequate capabilities to withstand extreme temperatures.

Impact on Critical Facilities

All critical facilities in the county are exposed to the extreme temperature hazard. Impacts to critical facilities are the same as described for general building stock. Additionally, it is essential that critical facilities remain operational during natural hazard events. Extreme heat events can sometimes cause short periods of utility





failures, commonly referred to as “brown-outs,” due to increased usage from air conditioners and other appliances. Similarly, heavy snowfall and ice storms associated with extreme cold temperature events can cause power interruption as well. Backup power is recommended for critical facilities and infrastructure.

Impact on the Economy

Extreme temperature events also have impacts on the economy, including loss of business function and damage/loss of inventory. Business owners may be faced with increased financial burdens due to unexpected repairs caused to the building (e.g., pipes bursting), higher than normal utility bills or business interruption due to power failure (i.e., loss of electricity, telecommunications).

The agricultural industry is most at risk in terms of economic impact and damage due to extreme temperature events. Extreme heat events can result in drought and dry conditions and directly impact livestock and crop production. Based on the 2017 Census of Agriculture, 1,646 farms were operating in Chester County, with a total of 150,514 acres of farmland. The average farm size was between 32 acres. Chester County’s farms had a total market value of products sold of over \$712,468,000.

An extreme heat event could result in drought conditions and have a serious impact on a community. During an extreme temperature event, water and electricity will likely be in increased demand, which may lead to shortages and a higher cost for these resources.

Impact on the Environment

Temporary periods of extreme hot or cold temperatures typically do not have significant environmental impacts but have serious health impacts, especially in urban areas experiencing the heat island effect. However, prolonged periods of hot temperatures could be associated with drought conditions and can damage or destroy vegetation, dry up rivers and streams, and reduce water quality. Prolonged exposure to extremely cold temperatures can kill wildlife and vegetation (PEMA 2018).

Extreme temperature events are also known to have an impact on utilities. In times of extreme heat, increased use of air conditioners can overload existing utility grids and spur localized or regionalized brownouts. Extreme cold events, especially when coupled with severe winter weather, can cause utility pipes to burst and interrupt the distribution of utilities. Prolonged extreme temperature events can also spur fuel shortages. The impact of extreme temperatures on utilities will depend on the overall use and duration of the event (PEMA 2018).

Future Growth and Development

Areas targeted for potential future growth and development within the next 5 years have been identified across Chester County and are discussed in Section 4.4 of this HMP. Any areas of growth could be potentially impacted by the extreme temperature hazard because the entire county is exposed and potentially vulnerable.

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by the type, frequency, and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such as extreme temperature events. While predicting changes of extreme temperature events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment (U.S. Environmental Protection Agency [EPA] 2006).



Additional Data and Next Steps

For future plan updates, the county can track data on extreme temperature events and obtain additional information on past and future events, particularly in terms of any injuries, deaths, shelter needs, pipe freeze, agricultural losses, and other impacts. This will help to identify any concerns or trends for which mitigation measures should be developed or refined. In time, quantitative modeling of estimated extreme heat and cold events may be feasible as data are gathered and improved.



4.3.7 Flood, Flash Flood, Ice Jam

This section provides a profile and vulnerability assessment of the flood, flash flood, ice jam hazard in Chester County. Floods are one of the most common natural hazards in the United States and are the most prevalent type of natural disaster occurring in Pennsylvania. Over 94 percent of the Commonwealth’s municipalities have been designated as flood-prone areas. Both seasonal and flash floods have been causes of millions of dollars in annual property damage, loss of lives, and disruption of economic activities (Pennsylvania Emergency Management Agency [PEMA] 2018).

The Federal Emergency Management Agency (FEMA) definition of flooding is “a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from the overflow of inland or tidal waters or the rapid accumulation of runoff of surface waters from any source” (FEMA 2015a).

Most floods fall into three categories: riverine, coastal, and shallow (FEMA 2015a). Other types of floods may include ice jam floods, flash floods, stormwater floods, alluvial fan floods, dam failure floods, and floods associated with local drainage or high groundwater (as indicated in the previous flood definition). For the purpose of this plan and as deemed appropriate by the Planning Team, riverine, flash, ice jam, and stormwater flooding are the main flood types of concern for Chester County. These types of floods are further discussed below. Flooding caused by dam failure is addressed in Section 4.3.1 of this plan.

Riverine Floods

Riverine floods are the most common flood type and occur along a channel. Channels are defined features on the ground that carry water through and out of a watershed. They may also be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas. These floods usually occur after heavy rains, heavy thunderstorms, or snowmelt, and can be slow or fast-rising, and generally develop over a period of hours to days (FEMA 2015a, Illinois Association for Floodplain and Stormwater Management 2006).

Flash Floods

According to the National Weather Service (NWS), flash floods are a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within 6 hours of the causative event (e.g., intense rainfall, dam failure, or ice jam) (NWS 2015).

Flash floods can occur very quickly and with very little warning. This type of flood can be deadly because it produces rapid rises in water levels and has devastating flow velocities. Urban areas are more susceptible to flash floods because a high percentage of the surface area is impervious (Pennsylvania Emergency Management Agency [PEMA] 2018). The elapsed time before flash flooding occurs may vary in different parts of the country. Ongoing flooding can intensify to flash flooding where intense rainfall results in a rapid surge of rising flood waters (NWS 2015). A flash flood can have a dangerous wall of roaring water that carries rocks, mud, and other debris, and can sweep away most things in its path. Flash floods usually result from intense storms dropping large amounts of rain within a brief period with little or no warning and can reach their peak within only a few minutes. They normally occur in the summer during the thunderstorm season. The most severe flooding conditions usually occur when direct rainfall is augmented by snowmelt. If the soil is saturated or frozen, stream flow may increase because of inability of the soil to absorb additional precipitation (FEMA 2008).



Ice Jam Floods

An ice jam is an accumulation of ice that acts as a natural dam and restricts flow of a body of water. Ice jams occur when warm temperatures and heavy rains cause rapid snow melt. The melting snow, combined with the heavy rain, causes frozen rivers to swell. The rising water breaks the ice layers into large chunks, which float downstream and often pile up near narrow passages and obstructions (bridges and dams). Ice jams may build up to a thickness great enough to raise the water level and cause flooding (Northeast States Emergency Consortium [NESEC] Date Unknown, U.S. Army Corps of Engineers [USACE] 2002).

Ice jams are of two different types: freeze-up and breakup. Freeze-up jams occur in the early to mid-winter when floating ice may slow or stop due to a change in water slope as it reaches an obstruction to movement. Breakup jams occur during periods of thaw, generally in late winter and early spring. The ice cover breakup is usually associated with a rapid increase in runoff and corresponding river discharge caused by a heavy rainfall, snowmelt, or warmer temperatures (USACE 2002).

Stormwater and Shallow Flooding

Stormwater flooding described below is caused by local drainage issues and high groundwater levels. Heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable channels. According to PEMA, since 1993, 96 percent of flooding reported to the NWS in Pennsylvania occurred outside of the 100-year floodplain.

If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems. During winter and spring, frozen ground and snow accumulations may contribute to inadequate drainage and localized ponding. Flooding issues of this nature generally occur in areas with flat gradients and generally increase with urbanization, which speeds the accumulation of floodwaters because of impervious areas. Shallow street flooding can occur unless channels have been improved to account for increased flows (FEMA 1997).

High groundwater levels can be a concern and cause problems even without surface flooding. Basements are susceptible to high groundwater levels. Seasonally high groundwater is common in many areas, while elsewhere high groundwater occurs only after long periods of above-average precipitation (FEMA 1997).

Urban drainage flooding is caused by increased water runoff due to urban development and drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and other urban areas. They make use of a closed conveyance system that channels water away from an urban area to surrounding streams. This bypasses the natural processes of water filtration through the ground, containment, and evaporation of excess water. Since drainage systems reduce the amount of time the surface water takes to reach surrounding streams, flooding in those streams can occur more quickly and reach greater depths than those prior to development in that area (FEMA 2007).

4.3.7.1 Location and Extent

Flooding in Pennsylvania is typically associated with abnormally high and intense rainfall amounts. It can also be caused by sudden snowmelt, landslides, or dam failures. In Pennsylvania, flooding usually occurs in the summer; however, it has occurred during the winter months as well.

Floodplains are found in lowland areas adjacent to rivers, streams, creeks, lakes, or other bodies of water that become inundated during a flood. The size of a floodplain depends on the recurrence interval of a given flood. A 1 percent annual chance floodplain is smaller than the floodplain associated with a flood that has a 0.2 percent annual chance of occurring (PEMA 2018). Floodplain maps of each Chester County jurisdiction are available



at the end of this profile. These maps show locations of both the 1 percent chance annual floodplain and the 0.2 percent chance annual floodplain.

Chester County’s greatest flooding threat is along the Schuylkill and Brandywine Rivers. Other major waterways within the county include the White Clay, French, Octorara, Red Clay, and Elk.

All municipalities in Chester County contain flood-prone areas because they are located along streams, creeks, or lakes. In addition, community development of the floodplain has resulted in frequent flooding. For inland areas, excess water from snowmelt or rainfall accumulates and overflows onto stream banks and adjacent floodplains. According to Chester County Water Resources Authority, Chester County has experienced the most precipitation in 2019, that was 17 percent above the county average. From January through July, the county received 37.4 inches of rain, which was 10.5 inches, (39 percent) above the normal value for this time period (Chester County Water Resources Authority 2019).

Table 4.3.7-1 lists total land areas within the 1 percent and 0.2 percent annual chance flood zones calculated via a spatial analysis referencing the 2017 Digital Flood Insurance Rate Map (DFIRM).

Table 4.3.7-1. Total Land Areas in the 1 Percent and 0.2 Percent Annual Chance Flood Zones (Acres)

Jurisdiction	NFIP-Participating Community	Total Area (acres)	1% Flood Event Hazard Area		0.2% Flood Event Hazard Area	
			Area (acres)	% of Total	Area (acres)	% of Total
Atglen Borough	X	565	86	15.2%	90	15.9%
Avondale Borough	X	315	105	33.4%	118	37.3%
Birmingham Township	X	4,174	646	15.5%	662	15.9%
Caln Township	X	5,705	480	8.4%	599	10.5%
Charlestown Township	X	8,016	316	3.9%	324	4.0%
Coatesville City	X	1,170	108	9.2%	140	11.9%
Downingtown Borough	X	1,423	270	19.0%	307	21.6%
East Bradford Township	X	9,700	1,310	13.5%	1,336	13.8%
East Brandywine Township	X	7,203	414	5.7%	443	6.2%
East Caln Township	X	2,356	133	5.6%	140	6.0%
East Coventry Township	X	6,982	967	13.8%	1,121	16.0%
East Fallowfield Township	X	9,995	554	5.5%	625	6.3%
East Goshen Township	X	6,504	727	11.2%	777	11.9%
East Marlborough Township	X	9,948	563	5.7%	580	5.8%
East Nantmeal Township	X	10,484	845	8.1%	843	8.0%
East Nottingham Township	X	12,893	648	5.0%	649	5.0%
East Pikeland Township	X	5,691	499	8.8%	666	11.7%
East Vincent Township	X	8,737	931	10.7%	963	11.0%
East Whiteland Township	X	7,042	327	4.6%	327	4.6%
Easttown Township	X	5,292	226	4.3%	285	5.4%
Elk Township	X	6,481	419	6.5%	417	6.4%
Elverson Borough	X	643	16	2.5%	16	2.5%



Table 4.3.7-1. Total Land Areas in the 1 Percent and 0.2 Percent Annual Chance Flood Zones (Acres)

Jurisdiction	NFIP- Participating Community	Total Area (acres)	1% Flood Event Hazard Area		0.2% Flood Event Hazard Area	
			Area (acres)	% of Total	Area (acres)	% of Total
Franklin Township	X	8,408	606	7.2%	607	7.2%
Highland Township	X	11,001	329	3.0%	341	3.1%
Honey Brook Borough	X	307	0	0.0%	0	0.0%
Honey Brook Township	X	16,116	1,501	9.3%	1,528	9.5%
Kennett Square Borough	X	9,887	749	7.6%	862	8.7%
Kennett Township	X	686	46	6.8%	58	8.4%
London Britain Township	X	6,283	552	8.8%	552	8.8%
London Grove Township	X	11,044	798	7.2%	873	7.9%
Londonderry Township	X	7,270	416	5.7%	419	5.8%
Lower Oxford Township	X	11,833	907	7.7%	906	7.7%
Malvern Borough	X	811	22	2.7%	22	2.7%
Modena Borough	X	226	59	26.0%	63	28.1%
New Garden Township	X	10,425	480	4.6%	489	4.7%
New London Township	X	7,515	531	7.1%	531	7.1%
Newlin Township	X	7,756	977	12.6%	1,026	13.2%
North Coventry Township	X	8,639	683	7.9%	732	8.5%
Oxford Borough	X	1,258	35	2.8%	35	2.8%
Parkesburg Borough	X	815	34	4.1%	43	5.3%
Penn Township	X	6,176	236	3.8%	237	3.8%
Pennsbury Township	X	6,443	500	7.8%	530	8.2%
Phoenixville Borough	X	2,378	358	15.1%	405	17.0%
Pocopson Township	X	5,328	772	14.5%	797	15.0%
Sadsbury Township	X	3,966	346	8.7%	349	8.8%
Schuylkill Township	X	5,702	648	11.4%	704	12.3%
South Coatesville Borough	X	1,128	76	6.7%	104	9.2%
South Coventry Township	X	4,862	312	6.4%	316	6.5%
Spring City Borough	X	525	102	19.3%	130	24.7%
Thornbury Township	X	2,471	286	11.6%	296	12.0%
Tredyffrin Township	X	12,703	414	3.3%	451	3.6%
Upper Oxford Township	X	10,700	563	5.3%	564	5.3%
Upper Uwchlan Township	X	7,502	1,050	14.0%	1,064	14.2%
Uwchlan Township	X	6,691	76	1.1%	86	1.3%
Valley Township	X	3,818	145	3.8%	172	4.5%
Wallace Township	X	7,755	500	6.5%	551	7.1%
Warwick Township	X	12,093	983	8.1%	1,000	8.3%



Table 4.3.7-1. Total Land Areas in the 1 Percent and 0.2 Percent Annual Chance Flood Zones (Acres)

Jurisdiction	NFIP- Participating Community	Total Area (acres)	1% Flood Event Hazard Area		0.2% Flood Event Hazard Area	
			Area (acres)	% of Total	Area (acres)	% of Total
West Bradford Township	X	11,902	490	4.1%	1,126	9.5%
West Brandywine Township	X	8,490	484	5.7%	493	5.8%
West Caln Township	X	14,028	792	5.6%	856	6.1%
West Chester Borough	X	1,182	48	4.1%	56	4.8%
West Fallowfield Township	X	11,672	414	3.5%	414	3.5%
West Goshen Township	X	7,680	587	7.6%	624	8.1%
West Grove Borough	-	417	0	0.0%	0	0.0%
West Marlborough Township	X	10,930	904	8.3%	927	8.5%
West Nantmeal Township	X	8,648	705	8.2%	733	8.5%
West Nottingham Township	X	8,936	724	8.1%	723	8.1%
West Pikeland Township	X	6,374	575	9.0%	598	9.4%
West Sadsbury Township	X	6,814	543	8.0%	559	8.2%
West Vincent Township	X	11,415	477	4.2%	480	4.2%
West Whiteland Township	X	8,272	807	9.8%	880	10.6%
Westtown Township	X	5,533	312	5.6%	476	8.6%
Willistown Township	X	11,689	901	7.7%	956	8.2%
Chester County	X	485,822	35,443	7.3%	38,168	7.9%

Source: FEMA 2017

Note: Areas listed also include inland waterways

In accordance with the 1978 Pennsylvania Stormwater Management Act (Act 167), counties are required to prepare stormwater management plans on a watershed-by-watershed basis; these plans provide for improved management of stormwater impacts associated with land development. In 2013, Chester County developed and implemented “Watersheds, an Integrated Water Resources Management Plan for Chester County,” which promotes watershed-based planning and management. The plan also serves as the county’s stormwater management plan in accordance with Act 167. The main seven goals of the plan are as follows:

- Engage and educate individuals, communities, and governments in watershed stewardship
- Enhance water-based recreational and cultural resources
- Preserve natural resources
- Improve water quality
- Reduce stormwater runoff and flooding
- Protect watershed water balances
- Integrate utility and municipal planning to meet future water supply and wastewater needs

Figure 4.3.7-1 shows PADEP-designated watersheds in Chester County.

The 2017 FEMA Flood Insurance Study (FIS) for Chester County also documents the major flooding problems in the county. According to the report, flooding is not a widespread problem for the county; this may be



attributable to the physical features of the watersheds and stream channels. In addition, local residents have limited development in low-lying stream banks and floodplains (FEMA 2016).

The following lists specific problem areas in the county identified through municipal surveys for “Blueprints,” or identified by municipal emergency management coordinators or other staff:

- Atglen Borough
 - Creek running under the Main Street Bridge crossing Fallowfield Road overflows and floods road and prevents people from accessing homes.
 - Green Street underpass repetitively floods.
 - Southwest of 41, Whitehorse Road prone to flooding
- City of Coatesville
 - Coatesville’s existing stormwater infrastructure in the downtown business district is aging and inadequate for existing needs. The system is in need of upgrades in order to ensure reliability and prevent flooding issues. As a portion of the district runs along the West Branch of the Brandywine Creek, which is the drainage point for much of the City, it is imperative that the systems functionality and capabilities are maintained to prevent flooding issues.
 - Several of the underpasses which travel underneath Amtrak’s Keystone Corridor experiences some level of flooding due to drainage issues during most storm events. Depending upon the severity of the storm, emergency services may need to perform rescues for stranded motorists. Additionally, due to the flooding response times to portions of the City north of the Keystone Corridor may be significantly delayed due to the need to find alternate routes. Additionally due to the flooding there are some areas of soil erosion which need to be repaired.
 - The existing stormwater infrastructure in the area of 5th Ave. and Olive St. is inadequate for the flow of water they receive. There are 3 inlets located in the valley of 5th Avenue which receive drainage from 5th Avenue and intersecting streets between Lincoln Highway and Walnut Street. Improvements and redundancy in the stormwater system are necessary to prevent flooding in this area.
 - The existing grocery store on the corner of Olive St. and S 5th Ave. experiences flooding during some storm events. Flood protection is necessary to prevent further flood damage.
 - Floodwaters pose a threat for travelers during/after storm events at Ash Park.
 - The Gibbons Runs culvert conveys Gibbons Run through the City of Coatesville and conveys most of the stormwater flow from the eastern end of the City to the West Branch of the Brandywine Creek. Due to the age of the structure, rehabilitation, repairs, and/or replacement are necessary in addition to an evaluation of the culverts capacity to convey stormwater and prevent flooding.
- Downingtown Township
 - Worsening flooding issues, including vehicles damaged and roads closed.
 - The newer land development is exacerbating the flooding issue, causing retention basins to overflow. During large rain events, the stormwater infrastructure is overwhelmed and roads flood. After the rain, the water flows into the waterways and floods other roads.
- East Vincent Township
 - French Creek area floods during heavy rain events
- Franklin Township
 - North Clay Creek and Churchill Road flooding
 - There is flooding at Green Bridge on Strickersville and Appleton Road
 - Blocked inlets from debris at 896 between Goodhope Road and Gypsy Hill



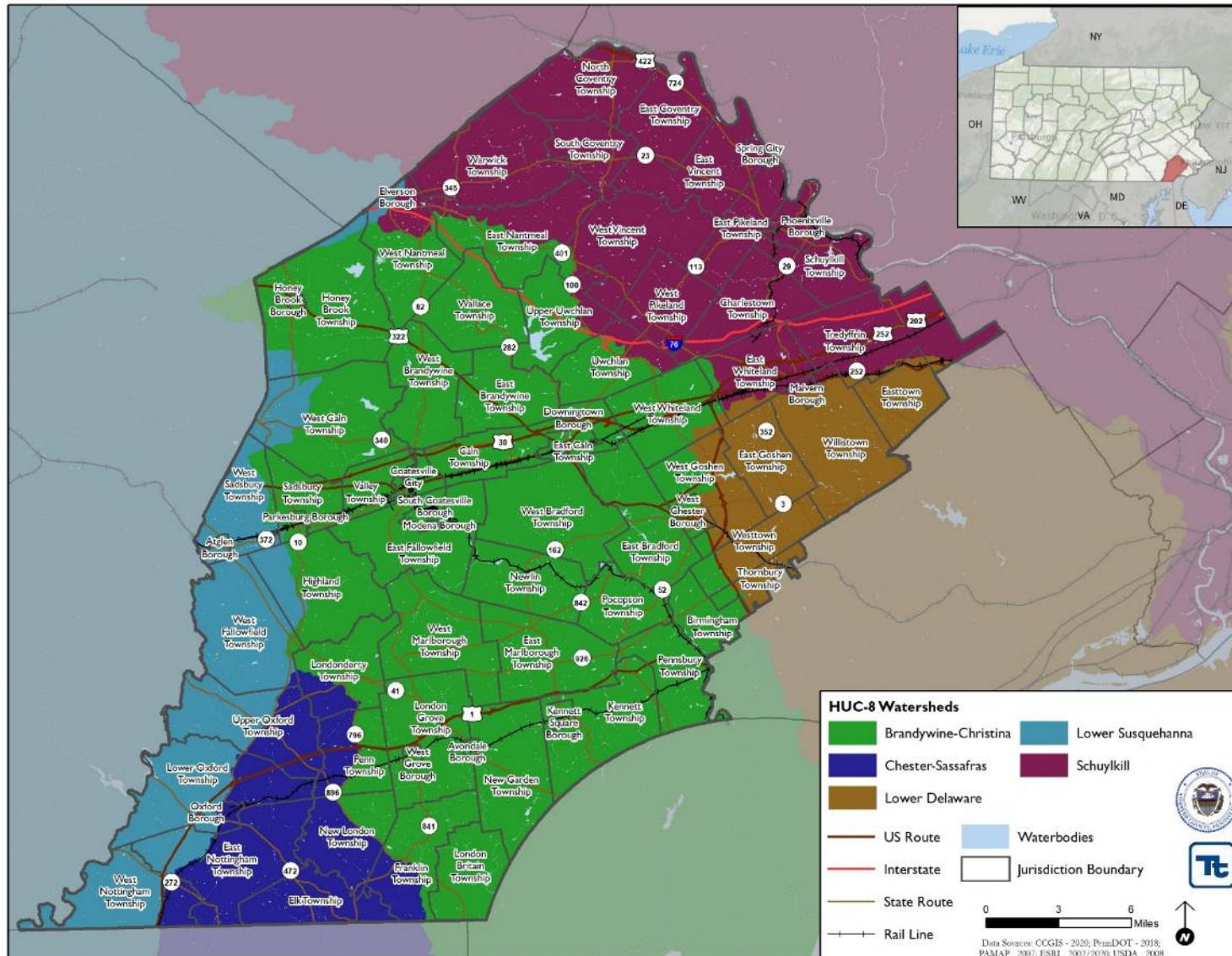
- Honey Brook Township
 - Along the West Branch of the Brandywine, the intersection of Birdell and Beaver Dam Roads often floods, which closes the road during heavy rain events.
- Kennett Township
 - A hurricane came though followed by a high-water event a few days later. Streets were underwater and the stormwater system was overwhelmed, especially near the east and west branches of the Brandywine Creek.
 - Five to six Pennsylvania Department of Transportation (PennDOT) and township roads following the stream (north-south) seem to flood, closing the roads during heavy rain events and causing considerable shoulder damage.
- Pocopson Township
 - Flooding around Brandywine Creek on Northbrook Road where there is a one lane historical bridge
- Sadsbury Township
 - There is a culvert on Greenbelt Drive that regularly floods
- Schuylkill Township – Storm water from N Forge Manor Drive affects Powling Woods neighborhood.
 - Water streams from open storm water drains coming from neighboring N Forge Manor Drive.
 - Water flows downstream to houses during very heavy rainfalls and causes flooding and damage to homes as well as to Pawlings Road.
- Thorndale Township
 - Business routes and the Route 30 railroad underpass flood four to five times during the year. Locations include Bailey Road near the train station and Wawa, and North and South Calen Road.
- Valley Township
 - Wagontown Road is substantially impacted by severe storms and flooding. In one specific area that closely borders the West Branch of Brandywine Creek, significant rainfalls can wash out and damage this important road. This road protects critical infrastructure below, namely sewer lines and PA American water lines that supply the Coatesville area.
 - Intense rainfall has caused stormwater flooding of Sucker Run near South Park Avenue and PA-372.
- Warwick Township
 - County Park Road, off Route 23 near Warwick Park, floods. Mt. Pleasant Road becomes inundated during heavy rain events.
- West Bradford Township
 - Roadway flooding along Broad Run Road between Beacon Hill
- West Goshen Township
 - The culvert near Goose Creek under Montgomery Avenue near Henderson High School clogs with debris and repeatedly floods, causing roads to close.
 - Sinkholes occur in residential backyards resulting from deteriorating stormwater piping constructed of corrugated metal pipe (CMP).



- West Marlborough Township
 - Route 82 from Unionville to Coatesville have a couple of bridges that flood
- Willistown Township
 - Water backs up under the bridge and repeatedly floods into a residential yard on White Horse Road where it crosses Crum Creek. The driveway and garage were inundated more than once, and a vehicle was lost.



Figure 4.3.7-1. Watersheds in Chester County, Pennsylvania





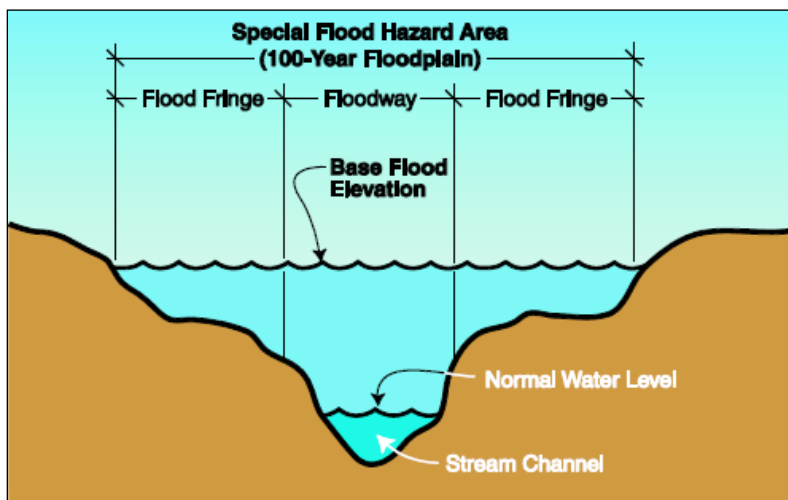
FEMA Regulatory Flood Zones

According to FEMA, flood hazard areas are defined as areas on a map shown to be inundated by a flood of a given magnitude. These areas are determined by statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with the community; floodplain topographic surveys; and hydrologic and hydraulic analyses. Flood hazard areas are delineated on FEMA’s Flood Insurance Rate Maps (FIRM), which are official maps of a community on which the Federal Insurance and Mitigation Administration has delineated both Special Flood Hazard Areas (SFHA) and the risk premium zones applicable to the community. These maps identify SFHAs, location of a specific property in relation to the SFHA, the base flood elevation (BFE) (1 percent annual chance) at a specific site, the magnitude of a flood hazard within a specific area, undeveloped coastal barriers where flood insurance is not available, and regulatory floodways and floodplain boundaries (1 percent and 0.2 percent annual chance floodplain boundaries) (FEMA 2003, 2005, and 2008). Chester County’s FIRMs can be accessed online via the FEMA Flood Map Service Center (<https://msc.fema.gov/portal>).

The SFHA on a FIRM consists of the land area covered by flood waters of the base flood. It is the area where the NFIP’s floodplain management regulations must be enforced, and the area where mandatory purchase of flood insurance applies. This regulatory boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities because many communities have maps showing the extent of the base flood and the depths that could occur.

The 1 percent annual chance flood is referred to as the base flood. As defined by NFIP, the BFE on a FIRM is the elevation of a base flood event, or a flood that has a 1 percent chance of occurring in any given year. The BFE describes the exact elevation of the water that will result from a given discharge level, which is one of the most important factors used in estimating potential damage within a given area. The flood fringe, is described as the remaining portion of the floodplain. A structure within a 1 percent annual chance floodplain has a 26 percent chance of undergoing flood damage during the term of a 30-year mortgage. The 1 percent annual chance flood is a regulatory standard used by federal agencies and most states to administer floodplain management programs. The 1 percent annual chance flood is used by NFIP as the basis for insurance requirements nationwide. FIRMs also depict 0.2 percent annual chance flood designations (FEMA 2016). Figure 4.3.7-2 depicts the SFHA, the BFE, the flood fringe, and the floodway areas of a floodplain for the 1 percent annual chance flood.

Figure 4.3.7-2. Floodplain Illustration



Source: FEMA 2018

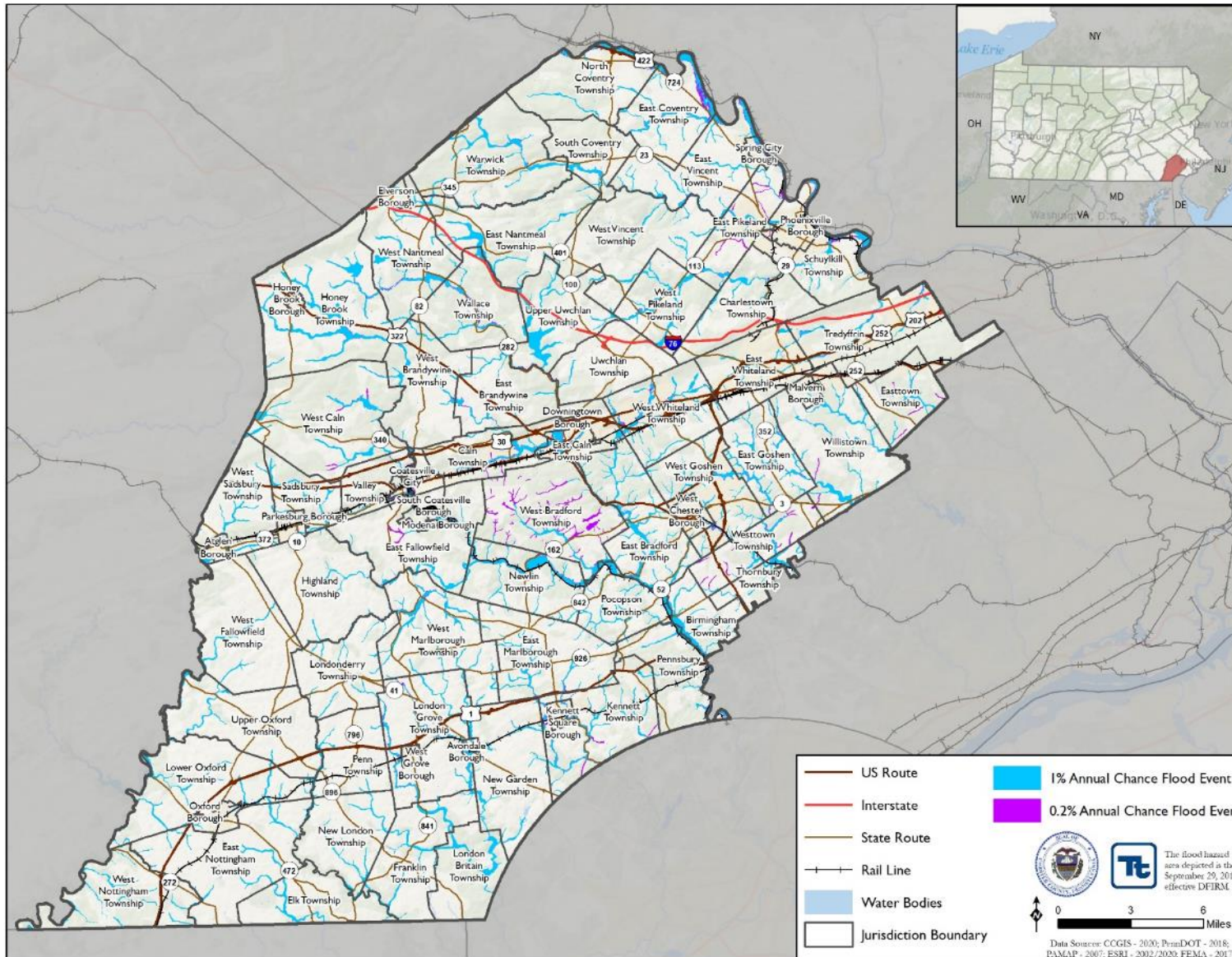


The SFHA serves as the primary regulatory boundary used by FEMA and Pennsylvania. Digitized Flood Insurance Rate Maps (DFIRMs), FIRMs, and other flood hazard information can be referenced to identify the expected spatial extent of flooding from a 1 percent annual chance event and 0.2 percent annual chance event.

At the time this plan was written, the March 2017 DFIRMs were considered the best available and were used for the risk analysis. Figure 4.3.7-3 illustrates NFIP flood zones in Chester County. Maps of each municipality's flood zones are shown at the end of this profile.



Figure 4.3.7-3. FEMA Flood Hazard Areas in Chester County





While the FIRMs provide a creditable source to document extent and location of the flood hazard, accuracy of data reflected on these maps has limitations. Notably, FIRMs are based on existing hydrological conditions at the time of map preparation. FIRMs are not set up to account for possible changes in hydrology over time.

Flood Insurance Study

In addition to FIRMs and DFIRMs, FEMA also provides FIS of entire counties and individual jurisdictions. These studies aid in administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. They are narrative reports of countywide flood hazards, including descriptions of flood areas studied and engineered methods used, principal flood problems, flood protection measures, and graphic profiles of flood sources (FEMA 2016). The countywide FIS for Chester County was last completed in 2017, at the same time as the DFIRM revisions.

Ice Jam Hazard Areas

Ice jams are common in northeastern United States, and the Commonwealth of Pennsylvania is not an exception. The ice jam database, maintained by the Ice Engineering Group at the USACE Cold Regions Research and Engineering Laboratory (CRREL) currently consists of over 19,000 records from across the United States. According to the USACE-CRREL, Chester County underwent or may have been impacted by two historical ice jam incidents between 1784 and 2019 (USACE 2019). Ice jams have formed along the French Creek and East Branch Brandywine Creek. Historical events are further mentioned in the “Previous Occurrences” section of this hazard profile.

4.3.7.2 Range of Magnitude

Both localized and widespread floods are considered hazards when people and property are affected. Injuries and deaths can occur when people are swept away by flood currents, or bacteria and disease are spread by moving or stagnant flood waters. Most property damage results from inundation by sediment-filled water. A large amount of rainfall over a short period of time can result in flash floods. Small amounts of rain can cause flooding in areas with frozen soil or saturated soils from a previous event, or if the rain is concentrated in areas with impervious surfaces (PEMA 2018).

Several factors determine severity of floods, including intensity and duration, topography, ground cover, and rate of snowmelt. Water runoff is greater in areas with steep slopes and little or no vegetative ground cover. Many areas in Pennsylvania have relatively steep slopes that promote quick surface water runoff. Most storms track from west to east; however, some originate in the Great Lakes or the Atlantic Ocean (PEMA 2018).

Rainfall in Pennsylvania is about average for the eastern United States. Amounts of precipitation can be divided into the following six categories:

- Very light rain – precipitation rate of <0.01 inch per hour
- Light rain – precipitation rate between 0.01 inch and 0.04 inch per hour
- Moderate rain – precipitation rate between 0.04 inch and 0.16 inch per hour
- Heavy rain – precipitation rate between 0.16 inch and 0.63 inch per hour
- Very heavy rain – precipitation rate between 0.63 inch and 2 inches per hour
- Extreme rain – precipitation rate greater than 2 inches per hour (PEMA 2018)

Severity of a flood depends not only on the amount of water that accumulates within a period of time, but also on the land's ability to manage this water. One element is the size of rivers and streams in an area, but an equally important factor is the land's absorbency. When it rains, soil acts as a sponge. When the land is saturated or



frozen, infiltration into the ground slows, and any more water that accumulates must flow as runoff (Harris 2008).

In the case of riverine or flash flooding, once a river reaches flood stage, the flood extent or severity categories used by NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding – minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding – some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding – extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary (NWS 2011).

Historically, the most severe flooding incident occurred in June 2006 as a result of heavy rainfall along the Brandywine Creek basin and Schuylkill River. Chester County was declared a disaster area. About 700 homes were damaged by the flooding, nearly 300 suffered major damage and four homes were destroyed, all in North Coventry Township of Chester County. Two sewage treatment plants, one water treatment plant, and one business were also badly damaged. The drinking water plants were shut down in Phoenixville and Downingtown. Dozens of major roads were closed, including Pennsylvania State Route 29 near the Schuylkill River and Pennsylvania State Routes 1 and 100 near the Brandywine Creek. The worst damage was concentrated along North Coventry Township on the Schuylkill River and the East Branch of the Brandywine Creek in Downingtown. Hundreds of people were evacuated from Downingtown, North Coventry, East Bradford, East Vincent, and Pocopson as several shelters were opened in the county. In North Coventry Township, 156 homes were damaged (four more were destroyed) as flood waters from the Schuylkill River reached the first floor. In South Coventry Township, 350 homes and businesses were flooded. In Downingtown, about 200 homes were flooded. Businesses were damaged on West Lincoln Highway. Many vehicles were damaged, and Kerr Park was flooded. In the Lyndell Section of East Brandywine Township, flooding reached the first floor of some homes. Flood damage was also reported in Caln Township, East Caln Township, Upper Uwchlan (where March Lake overflowed) and Uwchlan Township (NOAA NCEI 2020).

4.3.7.3 Past Occurrence

Chester County has a long history of flooding events. While flooding is often localized to streets and small neighborhoods, the county has historically experienced periodic storm events that affect multiple communities over a large area. Past building practices often resulted in homes being constructed in the FEMA-designated floodplains, exacerbating flooding problems within certain communities.

A gauge at Chadds Ford (CDFP1) monitors conditions on the Brandywine Creek and a gauge at Pottstown (PTNP1) monitors conditions on the Schuylkill River. A gauge below Downingtown (DWNP1) monitors conditions on the East Brandywine Creek. The NWS uses flood categories as forecast points that describe the severity of flood impacts in the river/stream reach. Table 4.3.7-2 summarizes the flood categories in feet at each of these gauges. Table 4.3.7-3 summarizes the top historic crests at these locations.



Table 4.3.7-2. Flood Categories at the Brandywine Creek at Chadds Ford (CDFP1), Schuylkill River at Pottstown (PTNP1), and East Brandywine Creek Below Downingtown (DWNP1) Gauges

Flood Category	Flood Category Definition	Brandywine at Chadds Ford (in feet)	Schuylkill River at Pottstown (in feet)	East Brandywine Creek Below Downingtown (in feet)
Major Flood Stage	Life-threatening and extensive inundation of structures and roads; significant evacuations are expected at this stage.	13	22	11
Moderate Flood Stage	Inundation of buildings usually begins at this stage; roads are likely to be closed and some areas cut off (evacuations may be necessary).	11	18	9
Flood Stage	Gauge height above which a rise in water surface level begins to create a hazard to lives, property or commerce; issuance of flood warnings is linked to flood stage.	9	12.5	7
Action Stage	Level where the NWS needs to take some type of mitigation action in preparation for possible significant hydrologic activity.	8	11	6

Source: NWS 2020

Table 4.3.7-3. Historic Crests at the Brandywine Creek at Chadds Ford (CDFP1), Schuylkill River at Pottstown (PTNP1), and East Brandywine Creek Below Downingtown (DWNP1) Gauges

Brandywine at Chadds Ford		Schuylkill at Pottstown		East Branch Brandywine Creek Below Downingtown	
Feet	Date	Feet	Date	Feet	Date
17.15	09/17/1999	29.97	06/23/1972	14.79	09/16/1999
16.56	06/22/1972	21.00	02/28/1902	14.38	06/28/2006
16.05	05/01/2014	20.84	06/29/2006	13.73	08/28/2011
15.23	08/28/2011	20.15	05/23/1942	13.59	08/04/2020
15.00	03/05/1920	19.20	08/24/1933	13.56	09/15/2003
14.80	08/09/1942	18.27	09/09/2011	13.50	05/01/2014
14.70	08/04/1915	18.21	01/25/1979	13.22	06/20/2003
14.64	08/19/1955	17.98	08/19/1955	13.00	10/01/2010
14.35	01/25/1979	17.88	01/27/1976	12.83	09/28/2004
14.32	08/05/2020	16.28	10/08/2005	12.60	10/19/1996

Source: NWS 2020

Water Level Data

A hydrograph shows how a water level changes over time at a specific location to enable a review of historic water levels, which are useful in floodplain management planning. In Chester County, there are three stream gauges. These forecast hydrographs are useful to reference when flooding is expected or to determine the observed water level for the past few days. The hydrographs for Brandywine at Chadds Ford, Schuylkill at Pottstown, and East Brandywine Creek below Downingtown provide water levels for the action, minor flooding, moderate flooding, and major flooding stages. They also display the flood of record (or the highest recorded water level) for the specific gauge. These stages are defined as follows:

- Action Stage - the stage which; when reached by a rising stream, lake, or reservoir represents the level where the NWS or a partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity.
- Minor Flooding - minimal or no property damage, but possibly some public threat.

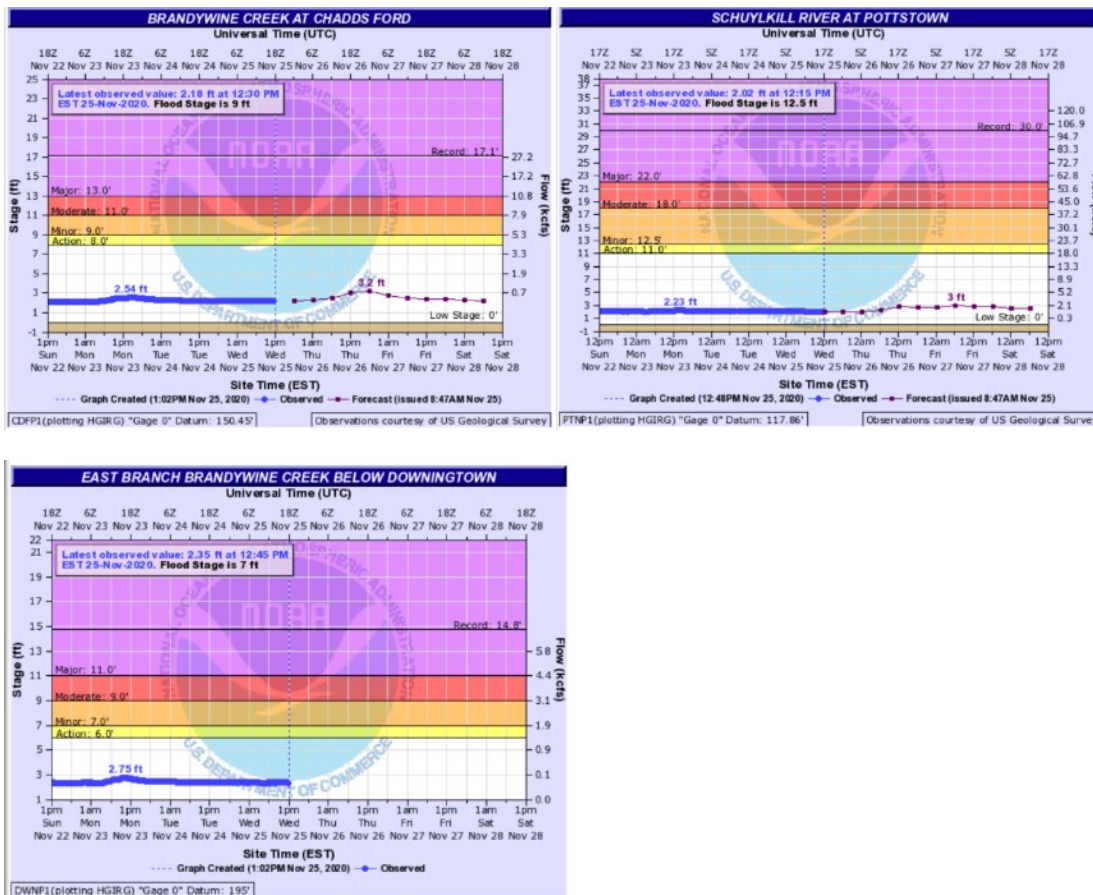




- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- Record Flooding - flooding that equals or exceeds the highest stage or discharge at a given site during the period of record keeping.
- Stage - level of the water surface in a river measured with reference to some datum.
- Flow - volume of water passing a given point per unit of time.
- kcfs - measurement of water flow equivalent to 1000 cubic feet of water passing a given point for an entire second (NWS 2020) (https://water.weather.gov/ahps2/pdf/hydrograph_terminology.pdf).

To illustrate the data available, screenshots of the gauges are provided in Figure 4.3.7-4. The first hydrograph in the figure provides data collected at the *Brandywine Creek at Chadds Ford* gauge, as captured on November 25, 2020. It indicates that high water level of record is 17.1 feet, Action Stage is 8 feet, Minor Stage is 9 feet, Moderate Stage is 11 feet, and Major Stage is 13 feet with the actual water height recorded as 2.18 feet at 12:30 pm on that day. This information is useful for local officials, emergency managers, and citizens to inform preparedness and response planning and activities to reduce potential impacts of flooding.

Figure 4.3.7-4. Flood Hydrographs for the Gauges in Chester County



Source: NWS 2020





According to the National Oceanic and Atmospheric Administration’s National Climatic Data Center (NOAA NCDC) storm event database, Chester County experienced 139 flood events between January 1, 1996, and October 31, 2020 (the date range of data availability). These events resulted in one fatality and over \$16.24 million in property damage.

Between 1954 and 2017, the Commonwealth of Pennsylvania underwent 52 FEMA-declared, flood-related disaster declarations (DR) or emergencies classified as one or a combination of the following disaster types: severe storms, mudslides, flash flooding, tropical storms, tropical depressions, high winds, and rains. Typically, these disasters covered a wide region of Pennsylvania; therefore, they may have impacted many counties. However, not all counties were included in the disaster declarations (FEMA 2017). Chester County was included in six of the declarations, as listed in Table 4.3.7-4.

Based on all sources researched, known flooding events resulting in property damage that affected Chester County and its municipalities since June 1971 are listed in Table 4.3.7-4. One death and one injury caused by flooding have been recorded in Chester County. With flood documentation for the Commonwealth of Pennsylvania so extensive, not all sources have been identified or researched. Therefore, Table 4.3.7-4 may not include all events that have occurred throughout the county.



Table 4.3.7-4. Flooding Events between 1971 and 2020 in Chester County

Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
September 18, 1971	Floods	Countywide	DR-312	Yes	No records were available.
June 23, 1972	Severe Storms, Flooding	Countywide	DR-340	Yes	No records were available.
July 17, 1973	Severe Storms, Flooding	Countywide	DR-400	Yes	No records were available.
January 19, 1996	Flooding	Countywide	DR-1093	Yes	No records were available.
August 17, 1998	Flooding	Countywide	N/A	N/A	Heavy rains caused urban flooding with 2.45 inches in Phoenixville during the afternoon.
September 16, 1999	Severe Storms, Flooding	Countywide	DR-1294	Yes	No records were available.
September 26, 2003	Flooding	Downingtown	N/A	N/A	The combination of snow melt and the precipitation caused minor flooding along a few creeks in Chester County. Precipitation totals included 1.88 inches in West Chester, 1.80 inches in Valley Forge, 1.67 inches in Glenmoore, and 1.41 inches at Honey Brook.
June 24, 2006	Flooding	Central Portion	N/A	N/A	Thunderstorms with torrential rains produced mudslides and flash flooding in and around Downingtown and Caln Township. Doppler Radar storm total estimates reached 6 inches.
June 26-27, 2006	Flooding	Countywide	N/A	N/A	Run-off from heavy rains caused flooding along several streams in Chester County. Roads were closed, 700 homes were damaged and 300 suffered major damage, two sewage treatment plants, one water treatment plant, and one business were damaged. Brandywine Creek and French Creek flooded. Event totals in the county averaged 6-12 inches.
October 28, 2006	Flooding	Downingtown	N/A	N/A	Heavy rains caused poor drainage and stream flooding in southeastern Pennsylvania. Storm totals averaged around 2 inches.
November 8, 2006	Flooding	Downingtown	N/A	N/A	About 2-3 inches of rain caused urban and poor drainage flooding as well as creek and river flooding. Vehicle accidents led to one fatality and seven injuries throughout the county.
November 16, 2006	Flooding	Honey Brook	N/A	N/A	The West Branch of the Brandywine Creek at Honey Brook was about its 7-foot flood stage. Storm totals included 2.24 inches.
January 1, 2007	Heavy Rain, Flooding	Downingtown	N/A	N/A	Heavy rains caused sections of both East and West Branch of the Brandywine Creek to flood. Storm totals within Chester County included 1.94 inches in Honey Brook, 1.78 inches in Glenmoore, 1.75 inches in Coatesville, 1.49 inches in Valley Forge, and 1.46 inches in Exton.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
March 2, 2007	Heavy Rain, Flooding	Aldham	N/A	N/A	The Brandywine Creek overflowed, flooding the intersection of Creek Road in Birmingham Township. Several other roads were closed due to flooding and rivers and creeks were above their flood stage throughout the county.
April 15, 2007	Heavy Rain, Flooding	Elverson	N/A	N/A	Flooding in the county was centered around Brandywine Creek. Many roads were closed, and creeks were above their flood stage. Precipitation totals included 4.97 inches in West Chester, 4.41 inches in Honey Brook, 4.19 inches in Glenmoore, and 3.65 inches in Coatesville. Snow accumulations were 2.0 inches in East Nantmeal Township and 0.5 inch in Coatesville.
April 27, 2007	Heavy Rain, Flooding	Downingtown	N/A	N/A	Runoff from earlier rain caused flooding along the east branch and main stem of the Brandywine Creek. Storm totals included 3.92 inches in Honey Brook, 3.30 inches in Glenmoore and 2.63 inches in East Nantmeal Township.
October 27, 2007	Heavy Rain, Flooding	Valley Forge	N/A	N/A	Valley Creek at Valley Forge was above its 7-foot flood stage. Storm totals within the county included 4.11 inches in West Chester, 4.04 inches in Valley Forge, 4.03 inches in London Grove. 3.88 inches in Longwood Gardens and 3.58 inches in East Nantmeal Township.
February 13, 2008	Heavy Rain, Flooding	Chadds Ford	N/A	N/A	Runoff from heavy rain and melting ice caused flooding along Brandywine Creek. Event precipitation totals included 2.94 inches in West Chester, 2.60 inches in Glenmoore, 2.59 inches in Modena, 2.56 inches in Downingtown, 2.47 inches in Honey Brook and 2.41 inches in Strickersville. The Brandywine Creek at Chadds Ford was above its 9-foot flood stage.
September 6, 2008	Heavy Rain, Flooding	Valley Forge	N/A	N/A	Heavy rain caused flooding along the Valley Creek. The Valley Creek at Valley Forge was above its 7-foot flood stage Storm totals in Chester County included 3.72 inches in Kenneth Square, 3.02 inches in Glenmoore and 2.47 inches in Honey Brook.
December 12, 2008	Heavy Rain, Flooding	Perkiomen	N/A	N/A	The East and West branches of the Brandywine Creek at Downingtown were above the 7-foot flood stage. Event precipitation totals included 2.58 inches in West Chester and 2.53 inches in East Nantmeal.
August 2, 2009	Heavy Rain, Flooding	Countywide	N/A	N/A	Runoff from showers and thunderstorms with heavy rain caused minor flooding along Valley Creek and East Branch of the Brandywine Creek.
August 13, 2009	Heavy Rain, Flooding	Countywide	N/A	N/A	Runoff from heavy rains caused flooding along a section of the East Branch of the Brandywine Creek.
September 11, 2009	Heavy Rain, Flooding	Countywide	N/A	N/A	Runoff from heavy rain caused minor flooding along Valley Creek. Event precipitation totals included 2.75 inches in Valley Forge.
September 20, 2009	Heavy Rain, Flooding	Countywide	N/A	N/A	Runoff from heavy rains caused flooding along sections of the Brandywine Creek near Honey Brook.
December 9, 2009	Heavy Rain, Flooding	Countywide	N/A	N/A	Runoff from melting snow and heavy rain caused poor drainage flooding and several creeks to flood in Chester County. The East and West Branches of the Brandywine Creek were above flood stage.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
December 26, 2009	Heavy Rain, Snow Melt	Manheim	N/A	N/A	The East Branch of the Brandywine Creek at Downingtown was above its flood stage. The main stem at Chadds Ford was above its flood stage as well.
January 25, 2010	Flood, Heavy Rain	Countywide	N/A	N/A	The East Branch of the Brandywine Creek below Downingtown was above its flood stage. Event precipitation totals included 2.44 inches in Kennett Square, 1.88 inches in West Chester, 1.48 inches in Unionville, and 1.41 inches in Nottingham.
March 13, 2010	Heavy Rain, Flooding	Countywide	N/A	N/A	The West and East Branches of the Brandywine Creek at Honey Brook were above the 7-foot flood stage. The French Creek at Phoenixville was above its 8-foot flood stage. The Valley Creek at Valley Forge was above its 7-foot flood stage. Event precipitation totals were 3.47 inches in West Chester, 3.36 inches in Unionville, 3.14 inches in Honey Brook, and 2.50 inches in Kenneth Square.
July 10, 2010	Heavy Rain, Flooding	Countywide	N/A	N/A	Torrential downpours from successive thunderstorms caused flash flooding along the Monocacy Creek as well as urban and poor drainage flooding in the Lehigh Valley. Runoff from the morning heavy rain caused flooding along the East Branch of the Brandywine Creek, which was above its 7-foot flood stage at Downingtown.
September 30-October 1, 2010	Heavy Rain, Flooding	Countywide	N/A	N/A	Heavy rains caused poor drainage and small stream flooding in the western half of Chester County. Roads flooded, and a bridge in Caln Township was inaccessible. Two-day storm totals included 9.79 inches in Kennett Square, 8.25 inches in West Chester, 7.49 inches in Nottingham, 7.36 inches in Unionville, and 7.27 inches in Spring City.
March 10, 2011	Heavy Rain, Flooding	Countywide	N/A	N/A	Flooding occurred along the Brandywine Creek and its branches flooding several roads in the county.
April 16, 2011	Heavy Rain, Flooding	Countywide	N/A	N/A	Heavy rain caused poor drainage flooding as well as moderate flooding along sections of the East Branch of the Brandywine Creek and minor flooding along the main stem of the Brandywine Creek and the Valley, and French Creeks.
August 28, 2011	Heavy Rain, Tropical System, Flood	Countywide	N/A	N/A	Irene produced heavy flooding rain, tropical storm force wind gusts with thousands of outages. The West and East Branches of the Brandywine Creek had moderate flooding. Event rainfall totals included 6.95 inches in Spring City, 6.80 inches in Unionville, 6.46 inches in West Chester, and 5.71 inches in Nottingham1
September 6, 2011	Heavy Rain, Flood	Countywide	N/A	N/A	The remnants of Tropical Storm Lee produced several days of heavy rains causing 4 to 9 inches of rain across Chester County. French Creek and Brandywine Creek had moderate flooding.
September 23, 2011	Heavy Rain, Flood	Countywide	N/A	N/A	Bands of showers and isolated thunderstorms with heavy rain moved through the region causing poor drainage, and creek and river flooding in southeastern Pennsylvania. Brandywine Creek Basin had the most widespread flooding.
November 23, 2011	Heavy Rain, Flood	Countywide	N/A	N/A	Periods of heavy rains caused the East and West Branches of the Brandywine Creek to flood.
December 8, 2011	Heavy Rain, Flood	Countywide	N/A	N/A	Minor flooding was reported in the Brandywine Creek basin and minor flooding occurred along the French and Valley Creeks.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
October 29-30, 2012	Heavy Rain, Flood	Honey Brook	N/A	N/A	Superstorm Sandy caused an initial estimate of \$20 million in damage in Pennsylvania. Many streams in Chester County had moderate flooding. Two roadways were closed along the main stem of the Brandywine Creek due to flooding. The West Branch of the Brandywine Creek at Honey Brook had moderate flooding. Event precipitation totals included 5.90 inches in Landenburg, 5.78 inches in West Chester, 5.59 inches in Exton, 4.75 inches in Glenmoore, 4.61 inches in Honey Brook, and 3.15 inches in Phoenixville
December 21, 2012	Heavy Rain, Flood	Countywide	N/A	N/A	The Valley Creek at Valley Forge was above its flood stage as well as the main stem of Brandywine Creek.
January 31, 2013	Heavy Rain, Flood	Countywide	N/A	N/A	Heavy rains caused poor drainage. The West Branch of the Brandywine Creek and the main stem were above their flood stage. Valley Creek and French Creek were also above their flood stage.
June 7, 2013	Heavy Rain, Flood	Countywide	N/A	N/A	Remnants of Tropical Storm Andrea led waves of heavy rains and thunderstorms causing flooding of streams in Chester County. Event precipitation totals included 4.24 inches in Unionville, 4.18 inches in Landenberg and Chatham, 3.99 inches in West Chester and Franklin, 3.98 inches in New London, and 3.92 inches in Spring City.
June 10, 2013	Flash Flood	Countywide	N/A	N/A	Heavy rain caused flash flooding of roadways and gauged streams and creeks. Several roads were closed in Chester County due to flooding, including PA Route 926 and Westtown Road in Westtown Township. Creek Road was also closed by PennDOT for a time due to flooding. Event precipitation totals included 3.01 inches in Modena, 2.24 inches in West Chester, 2.14 inches in Valley Forge, and 2.12 inches in Northbrook.
June 18, 2013	Flash Flood	Countywide	N/A	N/A	Event precipitation totals included 2.70 inches in East Nantmeal Township and 1.78 inches in Honey Brook.
June 27, 2013	Flood	Countywide	N/A	N/A	Heavy rain caused poor drainage flooding mainly in the western half of Chester County. It also led to flooding along sections of the East and West Branches of the Brandywine Creek. The West Branch of the Brandywine Creek at Honey Brook had moderate flooding. Event precipitation totals included 2.36 inches in Modena, 2.27 inches in West Grove and 2.01 inches in Glenmoore.
June 28, 2013	Flash Flood	Countywide	N/A	N/A	Thunderstorms with very heavy rain caused poor drainage and small stream flash flooding along the southern tier of Chester County.
July 12, 2013	Flash Flood	Countywide	N/A	N/A	Thunderstorms with heavy rain caused poor drainage and small stream flash flooding in southern Chester County. Event precipitation totals included 3.15 inches in West Grove, 2.86 inches in Landenburg, 2.55 inches in Nottingham, and 2.36 inches in Unionville.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
July 23, 2013	Flash Flood	Countywide	N/A	N/A	Heavy rain caused poor drainage and small stream flash flooding. Several roads were reported to be flooded across Chester County. Event precipitation totals included 1.58 inches in West Grove.
July 28, 2013	Flood	Countywide	N/A	N/A	Runoff from heavy rain caused minor flooding along the Valley Creek. Event precipitation totals included 2.32 inches in Kennett Square, 1.34 inches in Valley Forge, and 1.19 inches in West Chester.
August 13, 2013	Flash Flood	Countywide	N/A	N/A	Thunderstorms with torrential downpours caused poor drainage and smaller creek flash flooding in Chester County and then led to flooding along the East Branch and the Main Stem of the Brandywine Creek. About 30 vehicles became stuck in flood waters and five water rescues were performed. A mudslide occurred on the Pennsylvania Turnpike around mile marker 318 near Chester Springs.
October 11, 2013	Flood	Countywide	N/A	N/A	Runoff from heavy rain caused minor flooding along sections of the East Branch and Main Stem of the Brandywine Creek. The heavy rain also caused poor drainage. Event precipitation totals included 4.35 inches in Modena, 4.29 inches in Longwood, 3.76 inches in Northbrook, and 3.59 inches in Downingtown.
April 15, 2015	Flood	Countywide	N/A	N/A	Heavy rain caused poor drainage and creek flooding. Event precipitation totals included 2.50 inches in Spring City, 2.37 inches in West Chester, 2.20 inches in West Grove, 2.10 inches in Nottingham, and 2.00 inches in Chadds Ford
April 30, 2014	Flood	Countywide	N/A	N/A	Very heavy rain caused widespread poor drainage and moderate to major creek and river flooding throughout Chester County. Two apartment complexes had to be evacuated. Over 100 roadways were flooded and closed. More than 65 people were rescued from trapped vehicles. Three people trapped in their homes by flood waters were also rescued. Flooding along the main stem of the Brandywine Creek was the worst since Tropical Storm Floyd. In Avondale Borough, flooding along the East Branch of the White Clay Creek forced the evacuation of 300 residents in the Avondale Apartments on First Street late on the afternoon of the 30th. Residents were able to return on the morning of May 1st. In Modena Borough, flooding along the West Branch of the Brandywine Creek forced the evacuation of 400 residents of the Meredith Court Apartments.
May 16, 2014	Flood	Countywide	N/A	N/A	Event precipitation totals included 2.21 inches in Valley Forge, 2.13 inches in West Chester, 1.99 inches in Northbrook, 1.94 inches in Nottingham, 1.88 inches in Kennett Square, 1.70 inches in Spring City, 1.47 inches in Glenmoore, and 1.32 inches in Downingtown.
June 13, 2014	Flood	Countywide	N/A	N/A	Heavy rain caused minor flooding along the French Creek. Event precipitation totals included 1.75 inches at East Nantmeal, 1.39 inches in Unionville, and 1.30 inches in Spring City.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
July 10, 2014	Flash Flood	Countywide	N/A	N/A	Thunderstorms with heavy rain caused poor drainage flash flooding as well as smaller creek flash flooding in Downingtown. Also in Downingtown, flash flooding occurred along Green Street. One vehicle was stalled in the flood waters. Doppler Radar storm total estimates reached around 3.5 inches in central Chester County.
July 15, 2014	Flash Flood	Countywide	N/A	N/A	Slow moving thunderstorms caused flash flooding in eastern Chester County centered on East and West Whiteland Townships. In the Exton section of West Whiteland Township, flash flooding along the Valley Creek spilled onto parts of South Whitford Road and Commerce Drive. Doppler Radar storm total estimates reached between 1 and 2 inches in the county, most of which fell within 1 hour.
July 27, 2014	Flash Flood	Countywide	N/A	N/A	Thunderstorms with very heavy rain caused flash flooding in and around Elverson. A tributary to the North Branch of the French Creek flooded South Brick Lane. Flooding likely also occurred near the headwaters of the East Branch of the Conestoga River. A Skywarn spotter measured 2.6 inches in 1 hour in Elverson. Other event totals included 3.11 inches in Honey Brook, 2.56 inches in Warwick, and 2.39 inches in Glenmoore.
July 28, 2014	Flood	Countywide	N/A	N/A	The runoff from the thunderstorms with very heavy rain caused minor flooding along the West Branch of the Brandywine Creek. Event precipitation totals included 3.11 inches in Honey Brook, 2.56 inches in Warwick, and 2.39 inches in Glenmoore.
March 10, 2015	Flood	Countywide	N/A	N/A	The combination of rain and snowmelt caused minor flooding along the West Branch of Brandywine Creek. event precipitation totals included 0.73 inch in West Grove, 0.68 inch in Nottingham, and 0.66 inch in Chadds Ford and Unionville.
June 26, 2015	Flash Flood	Countywide	N/A	N/A	Thunderstorms with torrential downpours caused flash flooding in and around Phoenixville. A mesonet site within Phoenixville measured a total of 3.50 inches of rain.
February 16, 2016	Flood	Countywide	N/A	N/A	Heavy rain and snowmelt caused the East Branch of the Brandywine Creek below Downingtown to exceed flood stage for several hours.
February 24, 2016	Flood	Countywide	N/A	N/A	Strong severe thunderstorms, heavy rain, flash flooding and stream flooding.
March 31, 2017	Flood	Countywide	N/A	N/A	The East Branch of the Brandywine Creek rose above flood stage at Downingtown.
July 14, 2017	Flood	Countywide	N/A	N/A	Several roads were closed in lower Oxford Township.
July 22, 2017	Flood	Countywide	N/A	N/A	Flooding was reported on Bridge Street.
May 17, 2018	Flash Flood	Countywide	N/A	N/A	Flash flooding occurred along the East Branch of the Brandywine Creek in West Bradford Township and East Bradford Township. There was moderate flooding around the river gauge below Downingtown.
June 10, 2018	Flash Flood	Countywide	N/A	N/A	Flooding occurred along Clover Mill Road and Pikeland Road in East Pikeland Township and West Pikeland Township.



Date of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Losses/Impacts
July 22, 2018	Flash Flood	Countywide	N/A	N/A	Heavy downpours occurred in the county. One person was rescued from a vehicle trapped in high water in Upper Oxford Township.
August 13, 2018	Flash Flood	Countywide	N/A	N/A	Widespread roadway flooding in New Garden Township. Many roads were impassable, including Penn Green Road and Broad Run Road.
November 2, 2018	Flash Flood	Countywide	N/A	N/A	Moderate flooding occurred along the West Branch of the Brandywine Creek below Honey Brook.
June 13, 2019	Flash Flood	Countywide	N/A	N/A	Fast moving water covered Dilworthtown Road near Westtown Road in Thornbury Township.
June 20, 2019	Flash Flood	Countywide	N/A	N/A	Clover Mill Road was closed near Pike Springs Road in West Pikeland Township due to flash flooding.
July 11, 2019	Flash Flood	Countywide	N/A	N/A	Multiple water rescues took place along Twin County Road in Honey Brook Township.
July 18, 2019	Flash Flood	Countywide	N/A	N/A	Widespread roadway flooding occurred in West Goshen Township and in West Chester. There were water rescues on Gay Street and on Montgomery Avenue.
August 14, 2019	Flash Flood	Countywide	N/A	N/A	Parts of Lancaster Avenue in East Whiteland Township were closed due to flash flooding. Several vehicles became trapped in the flood waters.
November 1, 2019	Flash Flood	Countywide	N/A	N/A	Minor flooding occurred along the East Branch of the Brandywine Creek in West Bradford Township and East Bradford Township.
July 6, 2020	Flash Flood	Countywide	N/A	N/A	Flood waters washed rocks onto Valley Road in Paoli near the intersection with Lancaster Avenue.
August 4, 2020	Flash Flood	Countywide	N/A	N/A	Tropical Storm Isaias brought heavy rain to eastern Pennsylvania. Rainfall totals were as high as 5 to 8.5 inches. Several roads were flooded and closed, stormwater drainage was overwhelmed, some residents had to be rescued.
August 7, 2020	Flash Flood	Countywide	N/A	N/A	Severe thunderstorms and heavy rain. Roads were flooded and closed; some residents had to be rescued.
August 12, 2020	Flash Flood	Countywide	N/A	N/A	Heavy rains caused several roads to flood. A water rescue took place on Lincoln Avenue at Bailey Road in Caln Township. Another water rescue took place on Park Drive at G.O. Carlson Boulevard in Caln Township.

Sources: NOAA NCEI 2020; FEMA 2020

DR Federal Disaster Declaration

EM Emergency Management

EMA Emergency Management Agency

FEMA Federal Emergency Management Agency

NCEI National Centers for Environmental Information

NOAA National Oceanic Atmospheric Administration

N/A Not applicable/not available

SBA Small Business Administration

US United States





Based on review of the CRREL database, Table 4.3.7-5 lists the ice jam events that have occurred in or near the county between 1780 and 2020. Information regarding losses associated with these reported ice jams was limited.

Table 4.3.7-5. Ice Jam Events in Chester County between 1780 and 2017

City (Additional Geographic Identifier)	River	Jam Date	Water Year	Gauge Number	Impact
Downingtown	East Branch Brandywine Creek	December 6, 1969	1970	1480700	An ice jam/freeze up occurred in the East Branch of the Brandywine Creek
Phoenixville	French Creek	February 6, 2004	2004	1472157	Impact unknown

Source: USACE 2019

Notes:

Although events were reported for Chester County, information pertaining to every event was not easily ascertainable; therefore, this table may not list all ice jams in the county.

4.3.7.4 Future Occurrence

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of flood waters) and the related probability of occurrence. The NFIP uses historical records to determine the probability of occurrence for different extents of flooding. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year.

The NFIP recognizes the 1 percent annual chance flood, also known as the *base flood*, as the standard for identifying properties subject to federal flood insurance purchase requirements. A 1 percent annual chance flood is a flood that has a 1 percent chance of occurring over a given year. The DFIRMs identify areas subject to the 1 percent and 0.2 percent annual chance flooding. Areas subject to 2 percent and 10 percent annual chance events are not shown on maps; however, water surface elevations associated with these events are included in the flood source profiles contained in the Flood Insurance Study Report. Table 4.3.7-6 shows a range of flood recurrence intervals and associated probabilities of occurrence.

Table 4.3.7-6. Recurrence intervals and associated probabilities of occurrence

Flood Recurrence Interval	Chance of Occurrence in Any Given Year (%)	Flows
5 year	20	Extreme
10 year	10	Heavy to extreme
25 year	4	Moderate
50 year	2	Light to moderate
100 year	1	Light
500 year	0.2	Mild

Based on the historic and more recent flood events in Chester County, it is clear that the county has a high probability of flooding for the future. The fact that the elements required for flooding exist and that major flooding has occurred throughout the county in the past suggests that many people and properties are at risk from the flood hazard in the future.



For the 2021 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of flooding events for Chester County. Information from NOAA-NCEI storm events database, FEMA, Pennsylvania State Climatologist, and the CRREL ice jam database were used to identify the number of flood events that occurred between 1950 and 2020. Using these sources ensures the most accurate probability estimates possible. The table below shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year.

Table 4.3.7-7. Probability of Future Flooding Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (Average)	Recurrence Interval (in Years) (# Years/Number of Events)	Percent Chance of Occurrence in Any Given Year
Flash Flood	89	1.29	0.79	100%
Flood	58	0.84	1.21	82.86%
Ice Jam	2	0.03	35.00	2.86%

Sources: NOAA-NCEI 2020; FEMA 2020

It is estimated that Chester County will continue to experience direct and indirect impacts of annual flooding events that may induce secondary hazards, such as infrastructure deterioration or failure, utility failures; power outages; water quality and supply concerns; and transportation delays, accidents, and inconveniences. Therefore, the future occurrence of floods in Chester County has been adjusted and characterized as *highly likely*, when taking into consideration flash flooding, as defined by the Risk Factor Methodology probability criteria (see Table 4.4-1).

4.3.7.5 Vulnerability Assessment

The 1 and 0.2 percent annual chance flood events were examined to evaluate Chester County’s flood risk. Polygons representing the 1 and 0.2 percent annual chance events from the FEMA Risk Map products dated September 2017 were used to estimate exposure. Figure 4.3.7-3 presented earlier in this section illustrates the flood boundaries used for the vulnerability assessment. The 1 percent annual chance flood depth grid generated for the FEMA Risk Map program was imported into FEMA’s Hazus model and a riverine analysis was processed to estimate potential losses. The results are summarized below.

Impact on Life, Health, and Safety

Impacts of flooding on life, health, and safety depend on several factors including severity of the event and whether or not adequate warning time is provided to residents. Assumedly, the population living in or near floodplain areas that could be impacted by a flood would be exposed. However, exposure should not be limited only to those who reside within a defined hazard zone, but everyone who may be affected by a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event, as well as the first responders’ safety); the degree of that impact varies and is not strictly measurable.

Based on the spatial analysis, an estimated 5,191 people live in the Special Flood Hazard Area (SFHA, or 1 percent annual chance event floodplain) and an estimated 6,726 people are located in the 0.2percent annual chance flood event floodplain (Table 4.3.7-8). In the event of a flood hazard, these residents could be displaced from their homes, requiring them to seek temporary shelter with friends, family, or emergency shelters. The Borough of Downingtown has the greatest estimated number of individuals residing in the floodplain—approximately 487 people in the 1 percent and 686 people in the 0.2 percent chance flood boundaries, respectively. The Borough of Modena has the highest percentage of population within the 1 percent and 0.2



percent annual chance floodplains (15.6 percent and 17.1 percent, respectively, of its 873 total Borough population). For this project, the potential population exposed is used as a guide for planning purposes.

Table 4.3.7-8 Estimated Chester County Population Exposed to the 1 percent and 0.2 percent Flood Hazard Area

Jurisdiction	Total Population	Population in 1 Percent Flood Event Hazard Area		Population in .2 Percent Flood Event Hazard Area	
		Number	Percent of Total	Number	Percent of Total
Atglen (B)	1,459	8	0.5%	8	0.5%
Avondale (B)	1,295	143	11.0%	178	13.7%
Birmingham (Twp.)	4,207	65	1.5%	73	1.7%
Caln (Twp.)	14,198	159	1.1%	297	2.1%
Charlestown (Twp.)	5,813	18	0.3%	18	0.3%
Coatesville (C)	13,147	49	0.4%	131	1.0%
Downingtown (B)	7,929	487	6.1%	686	8.7%
East Bradford (Twp.)	9,959	109	1.1%	112	1.1%
East Brandywine (Twp.)	8,416	22	0.3%	41	0.0%
East Caln (Twp.)	4,876	4	0.1%	4	0.1%
East Coventry (Twp.)	6,770	113	1.7%	186	2.7%
East Fallowfield (Twp.)	7,567	53	0.7%	59	0.8%
East Goshen (Twp.)	18,199	146	0.8%	187	1.0%
East Marlborough (Twp.)	7,326	58	0.8%	63	0.9%
East Nantmeal (Twp.)	1,723	33	1.9%	33	1.9%
East Nottingham (Twp.)	8,929	57	0.6%	57	0.6%
East Pikeland (Twp.)	7,331	33	0.5%	102	1.4%
East Vincent (Twp.)	10,603	210	2.0%	217	2.0%
East Whiteland (Twp.)	7,062	29	0.4%	29	0.0%
Easttown (Twp.)	11,415	73	0.6%	97	0.8%
Elk (Twp.)	1,786	9	0.5%	9	0.5%
Elverson (B)	1,405	0	0.0%	0	0.0%
Franklin (Twp.)	4,506	63	1.4%	63	1.4%
Highland (Twp.)	1,370	8	0.6%	8	0.6%
Honey Brook (B)	1,865	0	0.0%	0	0.0%
Honey Brook (Twp.)	8,205	90	1.1%	92	1.1%
Kennett (Twp.)	8,177	59	0.7%	80	1.0%
Kennett Square (B)	6,159	30	0.5%	55	0.9%
London Britain (Twp.)	3,241	28	0.9%	28	0.9%
London Grove (Twp.)	2,450	11	0.4%	18	0.7%
Londonderry (Twp.)	8,615	37	0.4%	37	0.4%
Lower Oxford (Twp.)	5,058	44	0.9%	44	0.9%
Malvern (B)	3,440	0	0.0%	0	0.0%
Modena (B)	873	136	15.6%	149	17.1%
New Garden (Twp.)	12,111	74	0.6%	74	0.6%



Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Total Population	Population in 1 Percent Flood Event Hazard Area		Population in .2 Percent Flood Event Hazard Area	
		Number	Percent of Total	Number	Percent of Total
New London (Twp.)	1,312	4	0.3%	4	0.3%
Newlin (Twp.)	5,921	328	5.5%	422	7.1%
North Coventry (Twp.)	7,996	391	4.9%	407	5.1%
Oxford (B)	5,420	3	0.1%	3	0.1%
Parquesburg (B)	3,781	3	0.1%	3	0.1%
Penn (Twp.)	5,511	11	0.2%	11	0.2%
Pennsbury (Twp.)	3,649	31	0.8%	38	1.0%
Phoenixville (B)	16,815	70	0.4%	95	0.0%
Pocopson (Twp.)	4,838	102	2.1%	105	2.2%
Sadsbury (Twp.)	3,919	36	0.9%	36	0.9%
Schuylkill (Twp.)	8,639	35	0.4%	47	0.5%
South Coatesville (B)	1,276	0	0.0%	0	0.0%
South Coventry (Twp.)	2,631	12	0.5%	12	0.5%
Spring City (B)	3,320	6	0.2%	29	0.9%
Thornbury (Twp.)	3,181	23	0.7%	26	0.8%
Tredyffrin (Twp.)	29,481	113	0.4%	149	0.5%
Upper Oxford (Twp.)	2,518	43	1.7%	43	1.7%
Upper Uwchlan (Twp.)	11,509	92	0.8%	92	0.8%
Uwchlan (Twp.)	18,869	36	0.2%	39	0.2%
Valley (Twp.)	7,661	70	0.9%	119	1.6%
Wallace (Twp.)	3,678	10	0.3%	18	0.5%
Warwick (Twp.)	2,543	45	1.8%	49	0.0%
West Bradford (Twp.)	12,869	43	0.3%	240	1.9%
West Brandywine (Twp.)	7,482	22	0.3%	24	0.3%
West Caln (Twp.)	9,080	40	0.4%	48	0.5%
West Chester (B)	19,888	182	0.9%	301	1.5%
West Fallowfield (Twp.)	2,596	9	0.3%	9	0.3%
West Goshen (Twp.)	23,021	199	0.9%	199	0.9%
West Grove (B)	2,846	0	0.0%	0	0.0%
West Marlborough (Twp.)	771	41	5.3%	41	5.3%
West Nantmeal (Twp.)	1,999	19	1.0%	21	1.1%
West Nottingham (Twp.)	2,718	33	1.2%	33	0.0%
West Pikeland (Twp.)	4,069	68	1.7%	77	1.9%
West Sadsbury (Twp.)	2,393	28	1.2%	30	1.3%
West Vincent (Twp.)	5,257	52	1.0%	52	1.0%
West Whiteland (Twp.)	18,403	347	1.9%	391	2.1%
Westtown (Twp.)	10,916	33	0.3%	114	1.0%
Willistown (Twp.)	10,895	151	1.4%	163	1.5%





Jurisdiction	Total Population	Population in 1 Percent Flood Event Hazard Area		Population in .2 Percent Flood Event Hazard Area	
		Number	Percent of Total	Number	Percent of Total
Chester County (Total)	517,156	5,191	1.0%	6,726	1.3%

Sources: American Community Survey 2018 5-year estimates; FEMA 2017

Note: B – Borough; C – City; Twp. – Township

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impact on their families. The population over the age of 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available because of isolation during a flood event, and they may have more difficulty evacuating. They also may need to seek or need medical attention that may not be available due to isolation during a flood event. Within Chester County, approximately 79,856 people are over the age of 65 and 34,217 people are below the poverty level. The Borough of Downingtown, which has the most people in the floodplain, has an elderly population (age over 65 years) of 1,171.

The Centers for Disease Control and Prevention (CDC) 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. Chester County’s overall score is 0.1334, indicating that its communities have low vulnerability (CDC 2016).

Using 2010 U.S. Census data, Hazus estimates the potential sheltering needs as a result of a 1 percent annual chance flood event. For the 1 percent flood event, Hazus estimates 12,703 households will be displaced, and 219 people will seek short-term sheltering. The Borough of Downingtown would have the greatest displaced population (812 people) and the greatest number of persons seeking short-term shelter (31 people). These statistics, by jurisdiction, are presented in Table 4.3.7-9. The estimated displaced population and number of persons seeking short-term sheltering differs from the number of persons exposed to the 1 percent annual chance flood, because the displaced population numbers take into consideration that not all residents will be significantly impacted enough to be displaced or to require short-term sheltering during a flood event.

Table 4.3.7-9 Estimated Population Displaced or Seeking Short-Term Shelter from the 1Percent Annual Chance Flood Event

Jurisdiction	Population (ACS 5-Year 2014 - 2018)	1 Percent Annual Chance Event	
		Displaced Population	Persons Seeking Short-Term Sheltering
Atglen (B)	1,459	58	1
Avondale (B)	1,295	447	22
Birmingham (Twp.)	4,207	151	1
Caln (Twp.)	14,198	635	26
Charlestown (Twp.)	5,813	54	0
Coatesville (C)	13,147	135	2
Downingtown (B)	7,929	812	31
East Bradford (Twp.)	9,959	462	2
East Brandywine (Twp.)	8,416	127	0
East Caln (Twp.)	4,876	11	0
East Coventry (Twp.)	6,770	249	3
East Fallowfield (Twp.)	7,567	54	0



Jurisdiction	Population (ACS 5-Year 2014 - 2018)	1 Percent Annual Chance Event	
		Displaced Population	Persons Seeking Short-Term Sheltering
East Goshen (Twp.)	18,199	630	17
East Marlborough (Twp.)	7,326	168	1
East Nantmeal (Twp.)	1,723	25	0
East Nottingham (Twp.)	8,929	219	1
East Pikeland (Twp.)	7,331	156	2
East Vincent (Twp.)	10,603	253	1
East Whiteland (Twp.)	7,062	105	0
Easttown (Twp.)	11,415	117	0
Elk (Twp.)	1,786	33	0
Elverson (B)	1,405	11	0
Franklin (Twp.)	4,506	99	0
Highland (Twp.)	1,370	15	0
Honey Brook (B)	1,865	0	0
Honey Brook (Twp.)	8,205	258	2
Kennett (Twp.)	8,177	223	0
Kennett Square (B)	6,159	160	2
London Britain (Twp.)	3,241	53	0
London Grove (Twp.)	2,450	240	1
Londonderry (Twp.)	8,615	41	0
Lower Oxford (Twp.)	5,058	157	0
Malvern (B)	3,440	16	0
Modena (B)	873	160	4
New Garden (Twp.)	12,111	241	1
New London (Twp.)	1,312	94	0
Newlin (Twp.)	5,921	92	0
North Coventry (Twp.)	7,996	430	7
Oxford (B)	5,420	18	0
Parkesburg (B)	3,781	44	1
Penn (Twp.)	5,511	114	2
Pennsbury (Twp.)	3,649	63	0
Phoenixville (B)	16,815	205	10
Pocopson (Twp.)	4,838	293	7
Sadsbury (Twp.)	3,919	114	1
Schuylkill (Twp.)	8,639	118	1
South Coatesville (B)	1,276	2	0
South Coventry (Twp.)	2,631	27	0



Jurisdiction	Population (ACS 5-Year 2014 - 2018)	1 Percent Annual Chance Event	
		Displaced Population	Persons Seeking Short-Term Sheltering
Spring City (B)	3,320	79	6
Thornbury (Twp.)	3,181	153	1
Tredyffrin (Twp.)	29,481	368	3
Upper Oxford (Twp.)	2,518	62	0
Upper Uwchlan (Twp.)	11,509	244	2
Uwchlan (Twp.)	18,869	40	0
Valley (Twp.)	7,661	209	4
Wallace (Twp.)	3,678	40	0
Warwick (Twp.)	2,543	73	0
West Bradford (Twp.)	12,869	121	0
West Brandywine (Twp.)	7,482	83	0
West Caln (Twp.)	9,080	199	3
West Chester (B)	19,888	294	13
West Fallowfield (Twp.)	2,596	44	0
West Goshen (Twp.)	23,021	672	9
West Grove (B)	2,846	0	0
West Marlborough (Twp.)	771	53	0
West Nantmeal (Twp.)	1,999	49	0
West Nottingham (Twp.)	2,718	104	0
West Pikeland (Twp.)	4,069	187	0
West Sadsbury (Twp.)	2,393	87	0
West Vincent (Twp.)	5,257	75	0
West Whiteland (Twp.)	18,403	768	22
Westtown (Twp.)	10,916	177	1
Willistown (Twp.)	10,895	333	6
Chester County (Total)	517,156	12,703	219

Sources: Hazusv4.2; FEMA 2017; Chester County GIS 2020

Note: B – Borough; C – City; Twp. – Township

Total number of injuries and casualties resulting from typical riverine flooding is generally limited because of advance weather forecasting, blockades, and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning occurs and precautions are in place. Warning time for flash flooding is often limited. Flash flood events are frequently associated with other natural hazard events, such as earthquakes, landslides, or severe weather, which limits their predictability and compounds the hazard. Populations without adequate warning of the event are highly vulnerable to this hazard. Ongoing mitigation efforts should help to avoid the most likely cause of injury—persons trying to cross flooded roadways or channels. Mitigation action items addressing this issue are included in Section 6 (Mitigation Strategy) of this plan.

Cascading impacts may also include exposure to pathogens such as mold. After flood events, excess moisture and standing water contribute to growth of mold in buildings. Mold may present a health risk to building



occupants, especially those with already compromised immune systems such as infants, children, the elderly, and pregnant women. The degree of impact will vary and is not strictly measurable. Mold can grow in as short a period as 24-48 hours in wet and damaged areas of buildings that have not been properly cleaned. Very small mold spores can easily be inhaled, creating potential for allergic reactions, asthma episodes, and other respiratory problems. Buildings should be properly cleaned and dried out to safely prevent mold growth (Centers for Disease Control and Prevention [CDC] 2015).

Mold and mildew are not the only public health risk associated with flooding. Flood waters can be contaminated by pollutants such as sewage, human and animal feces, pesticides, fertilizers, oil, asbestos, and rusting building materials. Common public health risks associated with flood events also include:

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals
- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Mental stress and fatigue.

Current loss estimation models, such as Hazus, are not equipped to measure public health impacts. The best mitigation measures for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to address these vulnerabilities in responding to flood events.

Impact on General Building Stock

After consideration of the population exposed and vulnerable to the flood hazard, the built environment was evaluated. Exposure to the flood hazard includes those buildings within the flood zone. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content value.

The potential damage caused by flood events is the modeled loss that could occur to the exposed building stock measured by the structural and content replacement cost value. Table 4.3.7-10 summarizes these results. In total, 2,762 structures, or 1.2 percent of the building stock, are within the 1 percent annual chance flood zone; and 3,605 structures, or 1.5 percent of the building stock, are within the 0.2 percent flood zone. Approximately \$2.4 billion of building/contents are within the 1 percent annual chance flood zone in Chester County. This represents approximately 1.2 percent of the county's total general building stock replacement value inventory (\$194.7 billion). Also, an estimated \$3.9 billion of building/contents is within the 0.2 percent annual chance flood zone (2.0 percent of the county's total).

Furthermore, Hazus estimated potential damage to buildings in Chester County for the 1 percent annual chance flood event. Table 4.3.7-11 summarizes these results. In total, Hazus estimates \$432.3 million in potential building damage, which equates to 0.2 percent of the total replacement cost value in the county. Hazus estimates \$144.8 million in residential building loss, which is 0.1 percent of the total potential loss for all occupancy classes.



Table 4.3.7-10 Estimated General Building Stock Exposure to the 1 Percent and 0.2 Percent Annual Chance Flood Event – All Occupancies

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Total (All Occupancies)							
			1 Percent Annual Chance Event				0.2 Percent Annual Chance Event			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
Atglen (B)	583	\$300,171,233	7	1.2%	\$3,075,295	1.0%	7	1.2%	\$3,075,295	1.0%
Avondale (B)	436	\$275,491,131	56	12.8%	\$62,948,758	22.8%	68	15.6%	\$67,964,502	24.7%
Birmingham (Twp.)	1,774	\$1,521,752,088	36	2.0%	\$37,281,516	2.4%	40	2.3%	\$39,186,532	2.6%
Caln (Twp.)	5,696	\$4,389,258,174	65	1.1%	\$24,964,723	0.6%	129	2.3%	\$113,160,076	2.6%
Charlestown (Twp.)	2,655	\$2,334,124,537	10	0.4%	\$5,051,667	0.2%	11	0.4%	\$5,194,028	0.2%
Coatesville (C)	3,545	\$2,658,702,748	26	0.7%	\$172,146,168	6.5%	54	1.5%	\$272,280,675	10.2%
Downingtown (B)	2,619	\$2,678,308,815	181	6.9%	\$105,089,048	3.9%	262	10.0%	\$191,741,552	7.2%
East Bradford (Twp.)	4,033	\$3,166,888,223	64	1.6%	\$39,991,126	1.3%	66	1.6%	\$41,481,184	1.3%
East Brandywine (Twp.)	4,201	\$2,499,920,165	27	0.6%	\$14,843,428	0.6%	36	0.9%	\$18,164,345	0.7%
East Caln (Twp.)	1,509	\$1,864,909,402	4	0.3%	\$2,772,048	0.1%	5	0.3%	\$28,091,310	1.5%
East Coventry (Twp.)	3,832	\$2,200,926,728	72	1.9%	\$28,733,726	1.3%	131	3.4%	\$105,422,812	4.8%
East Fallowfield (Twp.)	4,025	\$1,984,687,476	27	0.7%	\$9,096,206	0.5%	34	0.8%	\$12,283,883	0.6%
East Goshen (Twp.)	6,498	\$5,680,635,001	56	0.9%	\$29,718,378	0.5%	71	1.1%	\$43,856,144	0.8%
East Marlborough (Twp.)	3,888	\$3,646,563,821	34	0.9%	\$16,811,213	0.5%	38	1.0%	\$19,315,108	0.5%
East Nantmeal (Twp.)	1,509	\$1,131,945,456	25	1.7%	\$9,084,980	0.8%	25	1.7%	\$9,084,980	0.8%
East Nottingham (Twp.)	4,960	\$3,185,167,607	30	0.6%	\$9,692,251	0.3%	30	0.6%	\$9,692,251	0.3%
East Pikeland (Twp.)	3,959	\$2,751,413,608	23	0.6%	\$9,660,051	0.4%	77	1.9%	\$157,840,916	5.7%
East Vincent (Twp.)	3,872	\$2,764,012,516	87	2.2%	\$46,305,420	1.7%	91	2.4%	\$48,714,525	1.8%
East Whiteland (Twp.)	5,002	\$8,143,686,632	33	0.7%	\$28,845,830	0.4%	33	0.7%	\$28,845,830	0.4%
Easttown (Twp.)	4,583	\$3,998,338,009	33	0.7%	\$18,428,515	0.5%	42	0.9%	\$23,982,387	0.6%
Elk (Twp.)	1,361	\$754,193,647	13	1.0%	\$5,578,095	0.7%	13	1.0%	\$5,578,095	0.7%
Elverson (B)	716	\$516,332,051	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Franklin (Twp.)	2,468	\$1,537,535,450	34	1.4%	\$19,580,978	1.3%	34	1.4%	\$19,580,978	1.3%





Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Total (All Occupancies)							
			1 Percent Annual Chance Event				0.2 Percent Annual Chance Event			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
Highland (Twp.)	1,304	\$1,067,555,265	11	0.8%	\$6,539,486	0.6%	12	0.9%	\$6,770,809	0.6%
Honey Brook (B)	771	\$446,825,932	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Honey Brook (Twp.)	4,871	\$3,389,705,910	52	1.1%	\$21,114,668	0.6%	53	1.1%	\$21,296,030	0.6%
Kennett (Twp.)	4,166	\$4,134,894,338	31	0.7%	\$21,547,321	0.5%	47	1.1%	\$62,257,866	1.5%
Kennett Square (B)	1,956	\$1,600,982,472	22	1.1%	\$16,814,531	1.1%	39	2.0%	\$43,025,772	2.7%
London Britain (Twp.)	1,782	\$1,064,040,035	19	1.1%	\$10,016,213	0.9%	19	1.1%	\$10,016,213	0.9%
London Grove (Twp.)	4,233	\$3,148,102,405	26	0.6%	\$10,845,081	0.3%	53	1.3%	\$28,359,986	0.9%
Londonderry (Twp.)	1,755	\$1,034,199,367	11	0.6%	\$4,691,992	0.5%	11	0.6%	\$4,691,992	0.5%
Lower Oxford (Twp.)	2,585	\$2,325,017,464	20	0.8%	\$6,905,284	0.3%	20	0.8%	\$6,905,284	0.3%
Malvern (B)	1,149	\$1,256,307,741	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
Modena (B)	226	\$143,886,459	45	19.9%	\$74,560,660	51.8%	48	21.2%	\$75,152,733	52.2%
New Garden (Twp.)	5,418	\$5,996,313,471	50	0.9%	\$57,432,168	1.0%	50	0.9%	\$57,432,168	1.0%
New London (Twp.)	2,955	\$1,850,994,293	8	0.3%	\$3,400,113	0.2%	8	0.3%	\$3,400,113	0.2%
Newlin (Twp.)	1,188	\$767,919,221	61	5.1%	\$25,121,259	3.3%	79	6.6%	\$33,228,612	4.3%
North Coventry (Twp.)	4,367	\$2,814,129,243	244	5.6%	\$137,384,359	4.9%	263	6.0%	\$143,184,674	5.1%
Oxford (B)	1,795	\$1,620,222,123	3	0.2%	\$1,514,451	0.1%	3	0.2%	\$1,514,451	0.1%
Parkesburg (B)	1,478	\$791,790,495	9	0.6%	\$5,231,440	0.7%	17	1.2%	\$24,456,642	3.1%
Penn (Twp.)	2,962	\$3,335,917,017	6	0.2%	\$1,512,456	0.0%	6	0.2%	\$1,512,456	0.0%
Pennsbury (Twp.)	1,793	\$1,741,030,601	15	0.8%	\$7,996,709	0.5%	19	1.1%	\$15,022,608	0.9%
Phoenixville (B)	6,031	\$4,404,373,172	76	1.3%	\$153,426,683	3.5%	95	1.6%	\$345,502,189	7.8%
Pocopson (Twp.)	1,781	\$1,616,048,060	43	2.4%	\$26,600,979	1.6%	50	2.8%	\$45,423,532	2.8%
Sadsbury (Twp.)	2,244	\$1,514,078,865	34	1.5%	\$15,316,532	1.0%	34	1.5%	\$15,316,532	1.0%
Schuylkill (Twp.)	4,116	\$3,296,773,180	44	1.1%	\$75,338,759	2.3%	53	1.3%	\$82,172,480	2.5%



Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Total (All Occupancies)							
			1 Percent Annual Chance Event				0.2 Percent Annual Chance Event			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
South Coatesville (B)	669	\$656,482,254	20	3.0%	\$59,116,649	9.0%	29	4.3%	\$160,051,463	24.4%
South Coventry (Twp.)	1,655	\$1,175,837,157	10	0.6%	\$6,888,942	0.6%	10	0.6%	\$6,888,942	0.6%
Spring City (B)	1,282	\$913,935,869	18	1.4%	\$68,598,755	7.5%	65	5.1%	\$254,083,772	27.8%
Thornbury (Twp.)	1,222	\$1,249,939,720	11	0.9%	\$9,197,478	0.7%	12	1.0%	\$9,590,348	0.8%
Tredyffrin (Twp.)	10,751	\$13,427,976,905	39	0.4%	\$28,773,969	0.2%	51	0.5%	\$34,263,270	0.3%
Upper Oxford (Twp.)	2,098	\$1,327,197,078	32	1.5%	\$11,222,382	0.8%	32	1.5%	\$11,222,382	0.8%
Upper Uwchlan (Twp.)	4,459	\$3,757,709,779	36	0.8%	\$17,626,567	0.5%	36	0.8%	\$17,626,567	0.5%
Uwchlan (Twp.)	6,633	\$7,025,589,763	12	0.2%	\$5,026,812	0.1%	13	0.2%	\$5,253,908	0.1%
Valley (Twp.)	3,430	\$2,597,377,442	40	1.2%	\$184,374,516	7.1%	65	1.9%	\$248,317,248	9.6%
Wallace (Twp.)	2,069	\$1,322,743,721	5	0.2%	\$2,069,125	0.2%	11	0.5%	\$6,341,702	0.5%
Warwick (Twp.)	2,175	\$1,133,542,100	38	1.7%	\$19,682,798	1.7%	44	2.0%	\$23,040,707	2.0%
West Bradford (Twp.)	6,163	\$3,995,074,181	26	0.4%	\$15,495,982	0.4%	134	2.2%	\$77,701,325	1.9%
West Brandywine (Twp.)	4,149	\$2,231,906,820	24	0.6%	\$13,692,860	0.6%	25	0.6%	\$14,682,891	0.7%
West Caln (Twp.)	6,021	\$2,765,167,902	46	0.8%	\$24,856,178	0.9%	54	0.9%	\$28,968,967	1.0%
West Chester (B)	4,156	\$5,374,643,016	57	1.4%	\$100,048,271	1.9%	85	2.0%	\$114,623,650	2.1%
West Fallowfield (Twp.)	2,171	\$1,743,066,295	9	0.4%	\$3,915,212	0.2%	9	0.4%	\$3,915,212	0.2%
West Goshen (Twp.)	8,399	\$9,444,801,871	99	1.2%	\$103,256,992	1.1%	108	1.3%	\$148,448,617	1.6%
West Grove (B)	1,053	\$499,625,186	0	0.0%	\$0	0.0%	0	0.0%	\$0	0.0%
West Marlborough (Twp.)	967	\$997,081,475	31	3.2%	\$14,191,681	1.4%	32	3.3%	\$15,181,157	1.5%
West Nantmeal (Twp.)	1,830	\$1,139,858,316	19	1.0%	\$11,847,329	1.0%	21	1.1%	\$13,085,437	1.1%
West Nottingham (Twp.)	1,989	\$1,196,217,005	36	1.8%	\$17,049,575	1.4%	36	1.8%	\$17,049,575	1.4%
West Pikeland (Twp.)	2,120	\$1,506,034,830	47	2.2%	\$37,635,663	2.5%	55	2.6%	\$48,363,390	3.2%



Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Total (All Occupancies)							
			1 Percent Annual Chance Event				0.2 Percent Annual Chance Event			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
West Sadsbury (Twp.)	1,876	\$1,651,357,888	27	1.4%	\$12,167,117	0.7%	28	1.5%	\$12,530,572	0.8%
West Vincent (Twp.)	3,532	\$2,587,356,437	37	1.0%	\$14,628,339	0.6%	38	1.1%	\$15,894,714	0.6%
West Whiteland (Twp.)	7,022	\$7,660,221,171	159	2.3%	\$168,470,397	2.2%	184	2.6%	\$215,704,537	2.8%
Westtown (Twp.)	4,175	\$3,282,102,771	15	0.4%	\$10,383,747	0.3%	48	1.1%	\$32,441,854	1.0%
Willistown (Twp.)	6,043	\$4,727,817,226	96	1.6%	\$56,767,214	1.2%	104	1.7%	\$61,699,007	1.3%
Chester County (Total)	232,759	\$194,736,735,824	2,762	1.2%	\$2,399,995,112	1.2%	3,605	1.5%	\$3,888,151,762	2.0%

Source: FEMA 2017; Chester County GIS 2020; RS Means 2019
 Note: B – Borough; C – City; Twp. – Township





Table 4.3.7-11 Estimated General Building Stock Potential Loss to the 1 Percent Annual Chance Flood Event

Jurisdiction	Total Replacement Cost Value	All Occupancies		Residential Losses Only		Commercial Losses Only		All Other Occupancies Total Losses	
		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total
Atglen (B)	\$300,171,233	\$184,221	0.1%	\$55,901	<0.1%	\$0	0.0%	\$128,320	<0.1%
Avondale (B)	\$275,491,131	\$7,321,098	2.7%	\$6,108,956	2.2%	\$1,111,282	0.4%	\$100,860	<0.1%
Birmingham (Twp.)	\$1,521,752,088	\$14,591,376	1.0%	\$3,279,055	0.2%	\$11,234,825	0.7%	\$77,497	<0.1%
Caln (Twp.)	\$4,389,258,174	\$3,506,559	0.1%	\$2,746,377	0.1%	\$5,849	<0.1%	\$754,334	<0.1%
Charlestown (Twp.)	\$2,334,124,537	\$1,448,034	0.1%	\$1,335,845	0.1%	\$0	0.0%	\$112,189	<0.1%
Coatesville (C)	\$2,658,702,748	\$31,219,329	1.2%	\$431,479	<0.1%	\$0	0.0%	\$30,787,850	1.2%
Downingtown (B)	\$2,678,308,815	\$11,187,086	0.4%	\$7,018,438	0.3%	\$3,187,757	0.1%	\$980,891	<0.1%
East Bradford (Twp.)	\$3,166,888,223	\$10,533,282	0.3%	\$4,759,927	0.2%	\$4,543,802	0.1%	\$1,229,553	<0.1%
East Brandywine (Twp.)	\$2,499,920,165	\$1,703,813	0.1%	\$955,943	<0.1%	\$747,870	<0.1%	\$0	0.0%
East Caln (Twp.)	\$1,864,909,402	\$339,484	0.0%	\$215,551	<0.1%	\$0	0.0%	\$123,932	<0.1%
East Coventry (Twp.)	\$2,200,926,728	\$4,817,189	0.2%	\$2,263,813	0.1%	\$912,920	<0.1%	\$1,640,456	0.1%
East Fallowfield (Twp.)	\$1,984,687,476	\$1,498,395	0.1%	\$1,494,162	0.1%	\$0	0.0%	\$4,232	<0.1%
East Goshen (Twp.)	\$5,680,635,001	\$2,278,343	0.0%	\$1,884,431	<0.1%	\$44,813	<0.1%	\$349,099	<0.1%
East Marlborough (Twp.)	\$3,646,563,821	\$1,295,141	<0.1%	\$1,110,207	<0.1%	\$96,914	<0.1%	\$88,020	<0.1%
East Nantmeal (Twp.)	\$1,131,945,456	\$1,048,259	0.1%	\$984,140	<0.1%	\$0	0.0%	\$64,119	<0.1%
East Nottingham (Twp.)	\$3,185,167,607	\$2,483,908	0.1%	\$2,322,909	0.1%	\$0	0.0%	\$160,999	<0.1%
East Pikeland (Twp.)	\$2,751,413,608	\$1,086,400	0.0%	\$699,829	<0.1%	\$361,623	<0.1%	\$24,947	<0.1%
East Vincent (Twp.)	\$2,764,012,516	\$8,103,858	0.3%	\$3,752,452	0.1%	\$976,962	<0.1%	\$3,374,443	0.1%
East Whiteland (Twp.)	\$8,143,686,632	\$3,844,386	<0.1%	\$1,100,112	<0.1%	\$1,016,347	<0.1%	\$1,727,926	<0.1%
Easttown (Twp.)	\$3,998,338,009	\$1,780,418	0.0%	\$1,328,735	<0.1%	\$0	0.0%	\$451,683	<0.1%
Elk (Twp.)	\$754,193,647	\$1,832,686	0.2%	\$1,214,546	0.2%	\$0	0.0%	\$618,140	0.1%
Elverson (B)	\$516,332,051	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%



Jurisdiction	Total Replacement Cost Value	All Occupancies		Residential Losses Only		Commercial Losses Only		All Other Occupancies Total Losses	
		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total
Franklin (Twp.)	\$1,537,535,450	\$5,584,193	0.4%	\$4,470,908	0.3%	\$0	0.0%	\$1,113,285	<0.1%
Highland (Twp.)	\$1,067,555,265	\$508,406	0.0%	\$272,760	<0.1%	\$0	0.0%	\$235,645	<0.1%
Honey Brook (B)	\$446,825,932	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Honey Brook (Twp.)	\$3,389,705,910	\$3,513,518	0.1%	\$2,319,710	0.1%	\$294,091	<0.1%	\$899,717	<0.1%
Kennett (Twp.)	\$4,134,894,338	\$2,530,253	0.1%	\$2,446,963	0.1%	\$36,302	<0.1%	\$46,988	<0.1%
Kennett Square (B)	\$1,600,982,472	\$1,497,131	0.1%	\$515,397	<0.1%	\$537,566	<0.1%	\$444,169	<0.1%
London Britain (Twp.)	\$1,064,040,035	\$3,360,479	0.3%	\$2,798,735	0.3%	\$0	0.0%	\$561,744	0.1%
London Grove (Twp.)	\$3,148,102,405	\$1,705,387	0.1%	\$475,484	<0.1%	\$1,186,550	<0.1%	\$43,354	<0.1%
Londonderry (Twp.)	\$1,034,199,367	\$997,246	0.1%	\$407,430	<0.1%	\$0	0.0%	\$589,816	0.1%
Lower Oxford (Twp.)	\$2,325,017,464	\$802,304	<0.1%	\$509,640	<0.1%	\$0	0.0%	\$292,665	0.0%
Malvern (B)	\$1,256,307,741	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Modena (B)	\$143,886,459	\$11,118,533	7.7%	\$3,569,325	2.5%	\$6,459,998	4.5%	\$1,089,211	0.8%
New Garden (Twp.)	\$5,996,313,471	\$7,024,456	0.1%	\$1,591,355	<0.1%	\$192,770	0.0%	\$5,240,331	0.1%
New London (Twp.)	\$1,850,994,293	\$823,643	<0.1%	\$823,643	<0.1%	\$0	0.0%	\$0	0.0%
Newlin (Twp.)	\$767,919,221	\$6,936,064	0.9%	\$3,443,722	0.4%	\$2,074,458	0.3%	\$1,417,884	0.2%
North Coventry (Twp.)	\$2,814,129,243	\$38,594,422	1.4%	\$16,831,324	0.6%	\$7,851,778	0.3%	\$13,911,320	0.5%
Oxford (B)	\$1,620,222,123	\$129,017	<0.1%	\$59,670	<0.1%	\$0	0.0%	\$69,347	0.0%
Parkesburg (B)	\$791,790,495	\$565,609	0.1%	\$52,269	<0.1%	\$513,340	0.1%	\$0	0.0%
Penn (Twp.)	\$3,335,917,017	\$290,685	<0.1%	\$248,171	<0.1%	\$0	0.0%	\$42,514	<0.1%
Pennsbury (Twp.)	\$1,741,030,601	\$1,938,571	0.1%	\$827,193	<0.1%	\$1,111,378	0.1%	\$0	0.0%
Phoenixville (B)	\$4,404,373,172	\$31,837,893	0.7%	\$3,152,910	0.1%	\$23,060,462	0.5%	\$5,624,521	0.1%
Pocopson (Twp.)	\$1,616,048,060	\$6,060,892	0.4%	\$2,736,816	0.2%	\$2,890,171	0.2%	\$433,904	<0.1%
Sadsbury (Twp.)	\$1,514,078,865	\$2,363,791	0.2%	\$675,833	<0.1%	\$1,375,686	0.1%	\$312,272	<0.1%



Jurisdiction	Total Replacement Cost Value	All Occupancies		Residential Losses Only		Commercial Losses Only		All Other Occupancies Total Losses	
		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total
Schuylkill (Twp.)	\$3,296,773,180	\$51,537,664	1.6%	\$909,844	<0.1%	\$2,591,690	0.1%	\$48,036,130	1.5%
South Coatesville (B)	\$656,482,254	\$15,804,413	2.4%	\$0	0.0%	\$11,207,464	1.7%	\$4,596,949	0.7%
South Coventry (Twp.)	\$1,175,837,157	\$2,139,840	0.2%	\$921,414	0.1%	\$1,218,426	0.1%	\$0	0.0%
Spring City (B)	\$913,935,869	\$6,265,545	0.7%	\$128,519	<0.1%	\$5,632,016	0.6%	\$505,009	0.1%
Thornbury (Twp.)	\$1,249,939,720	\$320,334	<0.1%	\$101,712	<0.1%	\$111,543	<0.1%	\$107,078	<0.1%
Tredyffrin (Twp.)	\$13,427,976,905	\$2,249,201	<0.1%	\$2,249,201	<0.1%	\$0	0.0%	\$0	0.0%
Upper Oxford (Twp.)	\$1,327,197,078	\$3,257,670	0.2%	\$2,848,306	0.2%	\$0	0.0%	\$409,365	0.0%
Upper Uwchlan (Twp.)	\$3,757,709,779	\$2,188,480	0.1%	\$2,035,995	0.1%	\$0	0.0%	\$152,485	0.0%
Uwchlan (Twp.)	\$7,025,589,763	\$777,806	0.0%	\$777,806	<0.1%	\$0	0.0%	\$0	0.0%
Valley (Twp.)	\$2,597,377,442	\$26,635,190	1.0%	\$2,171,505	0.1%	\$4,889,691	0.2%	\$19,573,995	0.8%
Wallace (Twp.)	\$1,322,743,721	\$183,737	0.0%	\$183,737	<0.1%	\$0	0.0%	\$0	0.0%
Warwick (Twp.)	\$1,133,542,100	\$2,840,069	0.3%	\$1,468,809	0.1%	\$955,359	0.1%	\$415,900	<0.1%
West Bradford (Twp.)	\$3,995,074,181	\$3,306,934	0.1%	\$2,851,360	0.1%	\$97,298	<0.1%	\$358,276	<0.1%
West Brandywine (Twp.)	\$2,231,906,820	\$3,377,566	0.2%	\$697,597	<0.1%	\$0	0.0%	\$2,679,969	0.1%
West Caln (Twp.)	\$2,765,167,902	\$1,838,635	<0.1%	\$930,094	<0.1%	\$151,782	<0.1%	\$756,759	<0.1%
West Chester (B)	\$5,374,643,016	\$4,302,557	0.1%	\$2,102,579	<0.1%	\$152,330	<0.1%	\$2,047,648	<0.1%
West Fallowfield (Twp.)	\$1,743,066,295	\$726,771	<0.1%	\$509,032	<0.1%	\$0	0.0%	\$217,739	<0.1%
West Goshen (Twp.)	\$9,444,801,871	\$7,512,918	0.1%	\$3,963,908	<0.1%	\$746,694	<0.1%	\$2,802,316	<0.1%
West Grove (B)	\$499,625,186	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
West Marlborough (Twp.)	\$997,081,475	\$2,502,392	0.3%	\$922,589	0.1%	\$1,221,846	0.1%	\$357,958	<0.1%
West Nantmeal (Twp.)	\$1,139,858,316	\$798,397	0.1%	\$451,124	<0.1%	\$70,203	<0.1%	\$277,070	<0.1%
West Nottingham (Twp.)	\$1,196,217,005	\$3,476,671	0.3%	\$1,512,436	0.1%	\$0	0.0%	\$1,964,235	0.2%
West Pikeland (Twp.)	\$1,506,034,830	\$7,616,708	0.5%	\$2,826,071	0.2%	\$230,578	<0.1%	\$4,560,060	0.3%



Jurisdiction	Total Replacement Cost Value	All Occupancies		Residential Losses Only		Commercial Losses Only		All Other Occupancies Total Losses	
		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event		1 Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total
West Sadsbury (Twp.)	\$1,651,357,888	\$672,475	0.0%	\$354,015	<0.1%	\$42,360	<0.1%	\$276,100	<0.1%
West Vincent (Twp.)	\$2,587,356,437	\$3,213,015	0.1%	\$1,987,552	0.1%	\$0	0.0%	\$1,225,463	<0.1%
West Whiteland (Twp.)	\$7,660,221,171	\$16,593,770	0.2%	\$10,720,661	0.1%	\$4,761,534	0.1%	\$1,111,575	<0.1%
Westtown (Twp.)	\$3,282,102,771	\$2,611,051	0.1%	\$125,128	<0.1%	\$0	0.0%	\$2,485,923	0.1%
Willistown (Twp.)	\$4,727,817,226	\$19,240,674	0.4%	\$7,789,172	0.2%	\$211,363	<0.1%	\$11,240,139	0.2%
Chester County (Total)	\$194,736,735,824	\$432,276,241	0.2%	\$144,832,228	0.1%	\$106,117,693	0.1%	\$181,326,320	0.1%

Sources: Hazusv4.2; FEMA 2017; Chester County GIS 2020; RS Means 2019
 Note: B – Borough; C – City; Twp. – Township





NFIP Statistics

In addition to total building stock modeling, individual data on flood policies, claims, and repetitive loss (RL) properties were analyzed. Severe repetitive loss (SRL) properties do not appear in Chester County data. According to Section 1361A of the National Flood Insurance Act (NFIA), as amended, 42 *United States Code* (U.S.C.) 4102a, the definition of a severe repetitive loss (SRL) property is a residential property covered by an NFIP flood insurance policy, and for which at least one of the following sets of claim payments have occurred:

- At least four NFIP claim payments (including building and contents) over \$5,000 each, with the cumulative amount payments for these claims exceeding \$20,000
- At least two separate payments for claims (building payments only), with the cumulative amount of the building portion of these payments exceeding the market value of the building

Moreover, for both above, at least two of the referenced claims must have occurred within any 10-year period and must have been submitted separately on dates more than 10 days apart.

An RL property is defined by FEMA’s Flood Mitigation Assistance (FMA) Program as an NFIP-insured structure that incurred flood-related damage on two occasions, and for which the cost of repair equaled or exceeded 25 percent of the market value of the structure at the time of each such flood.

Chester County has 781 RL properties throughout the county. Table 4.3.7-12 summarizes NFIP policies and claims, and numbers of RL properties, for Chester County’s municipalities.

Table 4.3.7-12 NFIP Policies, Claims, and Repetitive Loss Statistics

Municipality	Number of Policies	Number of Claims (Losses) Since 1978	Number of Repetitive Loss (RL) Properties	Total Loss Payments Since 1978
Atglen (B)	2	1	0	\$0
Avondale (B)	13	33	19	\$1,907,818
Birmingham (Twp.)	11	10	0	\$73,805
Caln (Twp.)	48	31	7	\$170,841
Charlestown (Twp.)	10	6	4	\$32,238
Coatesville (C)	7	15	4	\$58,848
Downingtown (B)	126	280	167	\$2,240,721
East Bradford (Twp.)	17	200	207	\$1,879,445
East Brandywine (Twp.)	16	16	0	\$36,390
East Caln (Twp.)	2	8	10	\$428,294
East Coventry (Twp.)	24	21	13	\$596,584
East Fallowfield (Twp.)	11	7	0	\$24,588
East Goshen (Twp.)	89	14	0	\$34,168
East Marlborough (Twp.)	19	4	0	\$57,212
East Nantmeal (Twp.)	3	2	0	\$15,336
East Nottingham (Twp.)	7	1	0	\$6,996
East Pikeland (Twp.)	16	7	4	\$20,518
East Vincent (Twp.)	20	25	12	\$363,922



Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Municipality	Number of Policies	Number of Claims (Losses) Since 1978	Number of Repetitive Loss (RL) Properties	Total Loss Payments Since 1978
East Whiteland (Twp.)	22	7	0	\$20,462
Easttown (Twp.)	47	7	0	\$14,537
Elk (Twp.)	0	0	0	\$0
Elverson (B)	0	0	0	\$0
Franklin (Twp.)	10	3	0	\$3,308
Highland (Twp.)	0	0	0	\$0
Honey Brook (B)	N/A	N/A	N/A	N/A
Honey Brook (Twp.)	3	2	0	\$20,000
Kennett (Twp.)	24	23	11	\$293,581
Kennett Square (B)	14	14	7	\$276,417
London Britain (Twp.)	4	3	0	\$2,697
London Grove (Twp.)	21	4	0	\$14,723
Londonderry (Twp.)	2	0	0	\$0
Lower Oxford (Twp.)	1	1	0	\$1,712
Malvern (B)	6	1	0	\$5,550
Modena (B)	5	9	0	\$101,708
New Garden (Twp.)	24	6	0	\$2,819
New London (Twp.)	4	2	0	\$0
Newlin (Twp.)	14	10	2	\$37,631
North Coventry (Twp.)	71	208	48	\$2,044,306
Oxford (B)	2	0	0	\$0
Parkesburg (B)	1	4	0	\$0
Penn (Twp.)	10	1	0	\$15,372
Pennsbury (Twp.)	6	9	4	\$185,578
Phoenixville (B)	33	54	16	\$1,061,530
Pocopson (Twp.)	13	137	87	\$2,505,005
Sadsbury (Twp.)	3	3	0	\$9,944
Schuylkill (Twp.)	22	46	2	\$467,169
South Coatesville (B)	0	0	0	\$0
South Coventry (Twp.)	3	2	0	\$11,946
Spring City (B)	10	11	1	\$97,718
Thornbury (Twp.)	9	10	0	\$53,816
Tredyffrin (Twp.)	136	80	35	\$1,548,505
Upper Oxford (Twp.)	1	3	0	\$1,306
Upper Uwchlan (Twp.)	25	8	7	\$153,315
Uwchlan (Twp.)	25	5	0	\$19,720





Municipality	Number of Policies	Number of Claims (Losses) Since 1978	Number of Repetitive Loss (RL) Properties	Total Loss Payments Since 1978
Valley (Twp.)	17	23	4	\$363,998
Wallace (Twp.)	6	2	0	\$1,374
Warwick (Twp.)	8	1	0	\$6,478
West Bradford (Twp.)	10	13	2	\$53,243
West Brandywine (Twp.)	4	2	0	\$5,029
West Caln (Twp.)	5	3	0	\$2,837
West Chester (B)	37	106	62	\$3,513,396
West Fallowfield (Twp.)	4	1	0	\$367
West Goshen (Twp.)	45	29	3	\$247,476
West Grove (B)	N/A	N/A	N/A	N/A
West Marlborough (Twp.)	3	1	0	\$918
West Nantmeal (Twp.)	4	3	0	\$2,204
West Nottingham (Twp.)	1	0	0	\$0
West Pikeland (Twp.)	19	4	0	\$12,244
West Sadsbury (Twp.)	0	8	2	\$42,871
West Vincent (Twp.)	15	12	0	\$50,784
West Whiteland (Twp.)	72	82	37	\$822,733
Westtown (Twp.)	26	6	2	\$16,884
Willistown (Twp.)	45	10	2	\$56,911
Chester County (Total)	1,333	1,660	781	\$22,117,846

Source: FEMA 2020

Note: B – Borough; C – City; Twp. – Township

Impact on Land Uses

An exposure analysis was completed to determine the acres of developed residential land and developed non-residential land use types located in the 1 percent and 0.2 percent flood hazard areas. To estimate exposure for developed residential and non-residential land use types to the 1 percent flood hazard area, the floodplain boundary was overlaid upon land use data. Across Chester County, natural land use has the highest percentage in flood areas. Approximately 11.8 percent and 12.5 percent of natural land use area is in the 1 percent and 0.2 percent annual chance flood zone, respectively. Non-residential land has the greatest area in flood areas. Approximately 32,135 acres of non-residential land area are located in the 1 percent annual chance flood zone and 34,420 acres of non-residential land area are in the 0.2 percent annual chance flood zone. Table 4.3.7-13 provides a summary of this analysis.



Table 4.3.7-13 Developed Residential and Non-Residential Land Use Exposed to 1 Percent and 0.2 Percent Annual Chance Flood Event Hazard Area

Land Use Type	Total Acres for County	1 Percent Annual Chance Event		0.2 Percent Annual Chance Event	
		Acres	Percent of Total	Acres	Percent of Total
Residential Land	43,701	1,440	3.3%	1,866	4.3%
Non-Residential Land	439,725	32,135	7.3%	34,420	7.8%
Natural Land	181,045	21,320	11.8%	22,613	12.5%
Chester County (Total)	483,425	33,575	6.9%	36,286	7.5%

Sources: FEMA 2017, Chester County GIS 2020, NLCD 2016

Note: Land use areas do not include areas of water. Non-residential area = Agriculture, Barren, developed – Open Space, Forest, Wetlands; This analysis does not incorporate areas delineated as water. Residential area = Developed – low intensity, developed – medium intensity, and Developed – high intensity.
 %=Percent

Impact on Critical Facilities

It is important to determine the critical facilities and infrastructure within the county that may be at risk to flooding (riverine, dam failure, flash/stormwater flooding), and that may be impacted should damage occur. Critical services during and after a flood event may not be available if facilities are directly damaged or transportation routes to access these critical facilities are impacted. Roads that are blocked or damaged can isolate residents and can prevent access throughout the planning area to many service providers needing to get to vulnerable populations or to make repairs. Utilities, such as overhead power, cable, and phone lines, could also be vulnerable because of damage to utility poles by standing water or the surge of water from a dam failure event. Loss of these utilities could create additional isolation issues for the inundation zones.

Major roadways that may be impacted by the 1 percent annual chance flood event include I-76, US-30, US-322, US-1, US-422, US-202, PA-3, PA-10, PA-23, PA-29, PA-41, PA-52, PA-82, PA-100, PA-113, PA-162, PA-252, PA-272, PA-282, PA-340, PA-345, PA-352, PA-372, PA-401, PA-472, PA-724, PA-841, PA-842, PA-896, and PA-926. Approximately 3.9 percent of all roadways are in the 1 percent annual chance flood event. Table 4.3.7-14 summarizes the total number of miles of exposed roadways. Several issues are associated with transportation route flooding, including isolation caused by bridges being washed out or blocked by floods or debris, health problems caused by water and sewer systems that are flooded or backed up, drinking water contamination caused by floodwaters carrying pollutants in water supplies, and localized urban flooding caused by culverts blocked with debris.

Table 4.3.7-14 Roadways Located in the 1 Percent Annual Chance Flood Area

Road Type	Total Miles for County	1 Percent Annual Chance Flood Event	
		Miles	Percent of Total
Local and Private Roads	3,794	141	3.7%
State Routes	374	18	4.9%
US Highways	229	11	4.8%
Interstate	58	2	3.7%
Chester County (Total)	4,454	172	3.9%

Sources: FEMA 2017, Chester County GIS 2020, PennDOT 2018

%=Percent





Critical facility exposure to the 1 percent and 0.2 percent annual chance flood hazard event boundary was examined. Table 4.3.7-16 lists critical facilities and utilities within the 1 percent annual change flood boundary. Table 4.3.7-16 lists critical facilities and utilities within the 0.2 percent annual change flood boundary. Section 4.4 (Hazard Vulnerability Summary) provides more information about the critical facilities and lifelines in Chester County. Table 4.3.7-17 and Table 4.3.7-18 summarize the number of critical facilities and lifelines exposed to the 1 percent and 0.2 percent flood inundation areas by jurisdiction. Of the 863 critical facilities located in the 1 percent annual chance flood event boundary, 765 are considered lifelines for the county and out of the 923 critical facilities located in the 0.2 percent annual chance flood event boundary, 806 are considered lifelines for the county.

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Table 4.3.7-15 Critical Facilities within the 1 Percent Annual Chance Flood Boundary

Municipality	Facility Types														
	Bridge	Bus Stop	Child Care Facility	Church	Dam	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Potable Water Treatment	SARA Site	Sewer Plant	Temple
Atglen (B)	5	0	0	0	0	0	0	0	1	0	0	0	1	1	0
Avondale (B)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birmingham (Twp.)	5	0	0	0	3	0	0	0	3	0	0	0	0	0	0
Caln (Twp.)	15	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Charlestown (Twp.)	13	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Coatesville (C)	6	0	0	0	2	0	1	1	0	0	0	0	0	0	0
Downingtown (B)	6	0	0	1	1	1	0	0	1	0	0	0	0	0	0
East Bradford (Twp.)	21	0	0	0	3	0	0	0	6	0	0	0	0	0	0
East Brandywine (Twp.)	13	0	0	0	3	0	0	0	2	0	0	0	0	0	0
East Caln (Twp.)	4	0	0	0	3	0	0	0	0	0	0	0	1	0	0
East Coventry (Twp.)	16	0	0	0	2	1	0	0	1	0	0	0	0	0	0
East Fallowfield (Twp.)	5	0	0	0	2	1	0	0	3	0	0	0	0	0	0
East Goshen (Twp.)	12	0	0	0	3	0	0	0	0	0	0	0	0	0	0
East Marlborough (Twp.)	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0
East Nantmeal (Twp.)	9	0	0	0	3	0	0	0	0	0	0	0	0	0	0
East Nottingham (Twp.)	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Pikeland (Twp.)	11	0	0	0	0	0	0	0	5	0	0	0	0	0	0
East Vincent (Twp.)	12	0	0	0	0	0	0	0	2	0	0	0	2	0	0
East Whiteland (Twp.)	25	0	0	0	3	0	0	0	1	2	0	0	0	0	0
Easttown (Twp.)	3	0	0	0	3	0	0	0	1	0	0	0	0	0	0
Elk (Twp.)	9	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Elverson (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Municipality	Facility Types														
	Bridge	Bus Stop	Child Care Facility	Church	Dam	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Potable Water Treatment	SARA Site	Sewer Plant	Temple
Franklin (Twp.)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highland (Twp.)	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Honey Brook (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Brook (Twp.)	11	0	0	0	3	0	0	0	0	0	0	0	1	0	0
Kennett (Twp.)	15	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Kennett Square (B)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
London Britain (Twp.)	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0
London Grove (Twp.)	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Londonderry (Twp.)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Oxford (Twp.)	18	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Malvern (B)	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0
Modena (B)	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0
New Garden (Twp.)	7	0	1	1	1	0	0	0	0	1	0	0	0	0	0
New London (Twp.)	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newlin (Twp.)	11	0	0	0	1	0	0	0	4	0	0	0	0	1	0
North Coventry (Twp.)	9	0	0	1	2	0	0	0	1	0	0	0	1	1	0
Oxford (B)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkesburg (B)	3	0	0	0	0	1	0	0	0	0	0	0	2	0	0
Penn (Twp.)	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Pennsbury (Twp.)	8	0	0	0	3	0	0	0	1	0	0	0	0	0	0
Phoenixville (B)	7	0	0	0	0	0	0	0	4	1	1	1	1	0	0
Pocopson (Twp.)	14	0	0	0	1	1	0	0	1	0	0	0	0	0	0
Sadsbury (Twp.)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schuylkill (Twp.)	7	0	0	0	1	1	0	0	0	1	0	0	2	0	0





Municipality	Facility Types														
	Bridge	Bus Stop	Child Care Facility	Church	Dam	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Potable Water Treatment	SARA Site	Sewer Plant	Temple
South Coatesville (B)	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
South Coventry (Twp.)	9	0	0	0	0	1	0	0	2	0	0	0	0	0	0
Spring City (B)	1	0	0	0	0	0	0	0	0	2	0	0	1	0	0
Thornbury (Twp.)	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Tredyffrin (Twp.)	27	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Upper Oxford (Twp.)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Uwchlan (Twp.)	7	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Uwchlan (Twp.)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Valley (Twp.)	9	0	1	0	0	0	0	0	2	0	0	0	0	0	0
Wallace (Twp.)	10	0	0	0	1	0	0	0	2	0	0	0	0	0	0
Warwick (Twp.)	8	0	0	0	1	0	0	0	5	0	0	0	0	0	0
West Bradford (Twp.)	11	0	0	0	0	0	0	0	3	0	0	0	0	1	1
West Brandywine (Twp.)	15	0	0	0	1	0	0	0	1	0	0	0	0	0	0
West Caln (Twp.)	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0
West Chester (B)	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
West Fallowfield (Twp.)	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0
West Goshen (Twp.)	13	0	0	1	2	0	0	0	1	0	0	0	3	0	0
West Grove (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Marlborough (Twp.)	11	0	0	0	1	0	0	0	3	0	0	0	0	0	0
West Nantmeal (Twp.)	10	0	0	0	1	0	0	0	1	0	0	0	0	0	0
West Nottingham (Twp.)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Pikeland (Twp.)	13	0	0	0	1	0	0	0	2	0	0	0	0	0	0
West Sadsbury (Twp.)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Vincent (Twp.)	10	0	0	0	1	0	0	0	3	0	0	0	0	0	0





Municipality	Facility Types														
	Bridge	Bus Stop	Child Care Facility	Church	Dam	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Potable Water Treatment	SARA Site	Sewer Plant	Temple
West Whiteland (Twp.)	26	1	0	0	4	1	0	0	5	0	0	0	0	0	0
Westtown (Twp.)	7	0	0	0	1	0	0	0	1	0	0	0	0	1	0
Willistown (Twp.)	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0
Chester County (Total)	646	1	2	4	81	10	1	1	81	9	1	1	18	6	1

Source: Chester County GIS 2020, FEMA 2017

Note: B – Borough; C – City; Twp. – Township; SARA – Superfund Amendments and Reauthorization Act





Table 4.3.7-16. Critical Facilities within the 0.2 Percent Annual Chance Flood Boundary

Jurisdiction	Facility Types																		
	Bridge	Bus Stop	Cable Provider	Child Care Facility	Church	Dam	District Court	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Post Office	Potable Water Treatment	SARA Site	Sewer Plant	Telecom	Temple
Atglen (B)	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0
Avondale (B)	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Birmingham (Twp.)	5	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0
Caln (Twp.)	16	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Charlestown (Twp.)	13	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Coatesville (C)	7	0	0	0	0	2	0	0	1	1	0	0	0	0	0	1	0	0	0
Downingtown (B)	6	0	0	1	2	1	0	1	0	0	1	0	0	0	0	0	0	0	0
East Bradford (Twp.)	21	0	0	0	0	3	0	0	0	0	6	0	0	0	0	0	0	0	0
East Brandywine (Twp.)	13	0	0	0	0	3	0	0	0	0	2	0	0	1	0	0	0	0	0
East Caln (Twp.)	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0
East Coventry (Twp.)	17	0	0	0	0	2	0	1	0	0	1	0	0	0	0	1	0	0	0
East Fallowfield (Twp.)	7	0	0	0	0	3	0	1	0	0	3	0	0	0	0	0	0	0	0
East Goshen (Twp.)	12	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
East Marlborough (Twp.)	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
East Nantmeal (Twp.)	9	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
East Nottingham (Twp.)	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Pikeland (Twp.)	11	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	0
East Vincent (Twp.)	12	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0
East Whiteland (Twp.)	25	0	0	0	0	3	0	0	0	0	1	2	0	0	0	0	0	0	0
Easttown (Twp.)	3	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0
Elk (Twp.)	9	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
Elverson (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Facility Types																		
	Bridge	Bus Stop	Cable Provider	Child Care Facility	Church	Dam	District Court	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Post Office	Potable Water Treatment	SARA Site	Sewer Plant	Telecom	Temple
Franklin (Twp.)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highland (Twp.)	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Brook (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Honey Brook (Twp.)	11	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0
Kennett (Twp.)	17	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0
Kennett Square (B)	4	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0
London Britain (Twp.)	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
London Grove (Twp.)	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Londonderry (Twp.)	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Oxford (Twp.)	18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Malvern (B)	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
Modena (B)	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0
New Garden (Twp.)	7	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0
New London (Twp.)	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newlin (Twp.)	11	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	1	0	0
North Coventry (Twp.)	10	0	0	0	1	2	0	0	0	0	1	0	0	0	0	1	1	0	0
Oxford (B)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkesburg (B)	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0
Penn (Twp.)	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Pennsbury (Twp.)	8	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0
Phoenixville (B)	8	0	0	0	0	2	1	0	0	0	4	1	1	0	1	1	0	0	0
Pocopson (Twp.)	14	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0
Sadsbury (Twp.)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schuylkill (Twp.)	7	0	0	0	0	1	0	1	0	0	0	1	0	0	0	2	0	0	0





Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Facility Types																		
	Bridge	Bus Stop	Cable Provider	Child Care Facility	Church	Dam	District Court	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Post Office	Potable Water Treatment	SARA Site	Sewer Plant	Telecom	Temple
South Coatesville (B)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
South Coventry (Twp.)	9	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
Spring City (B)	2	0	0	0	0	0	0	0	0	0	1	3	0	0	0	1	1	0	0
Thornbury (Twp.)	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Tredyffrin (Twp.)	27	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
Upper Oxford (Twp.)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Uwchlan (Twp.)	7	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Uwchlan (Twp.)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Valley (Twp.)	10	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Wallace (Twp.)	10	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Warwick (Twp.)	8	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0
West Bradford (Twp.)	12	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	1	0	1
West Brandywine (Twp.)	15	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
West Caln (Twp.)	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
West Chester (B)	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
West Fallowfield (Twp.)	9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
West Goshen (Twp.)	13	0	0	0	1	2	0	0	0	0	1	0	0	0	0	5	0	0	0
West Grove (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Marlborough (Twp.)	12	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0
West Nantmeal (Twp.)	10	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
West Nottingham (Twp.)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Pikeland (Twp.)	13	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0
West Sadsbury (Twp.)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Vincent (Twp.)	10	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0





Jurisdiction	Facility Types																		
	Bridge	Bus Stop	Cable Provider	Child Care Facility	Church	Dam	District Court	Electrical Substation	EMS Station	Fire Station	Historic	Major Business	Police Station	Post Office	Potable Water Treatment	SARA Site	Sewer Plant	Telecom	Temple
West Whiteland (Twp.)	29	1	0	0	0	4	0	1	0	0	6	0	0	0	0	2	0	1	0
Westtown (Twp.)	7	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	1	0	0
Willistown (Twp.)	13	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Chester County (Total)	665	1	1	3	10	89	1	10	1	1	86	10	1	2	1	30	9	1	1

Source: Chester County GIS 2020, FEMA 2017

Note: B – Borough; C – City; Twp. – Township; SARA – Superfund Amendments and Reauthorization Act

Table 4.3.7-17 Critical Facility Types Located in the 1 Percent Annual Chance Event Floodplain and Estimated Damage

Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 1 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Atglen (B)	20	17	8	40.0%	8	47.1%
Avondale (B)	19	15	3	15.8%	3	20.0%
Birmingham (Twp.)	34	26	11	32.4%	8	30.8%
Caln (Twp.)	101	70	16	15.8%	16	22.9%
Charlestown (Twp.)	64	45	15	23.4%	15	33.3%
Coatesville (C)	79	45	10	12.7%	8	17.8%
Downingtown (B)	86	53	10	11.6%	8	15.1%
East Bradford (Twp.)	73	61	30	41.1%	28	45.9%
East Brandywine (Twp.)	49	40	18	36.7%	16	40.0%
East Caln (Twp.)	64	29	8	12.5%	5	17.2%
East Coventry (Twp.)	49	37	20	40.8%	18	48.6%
East Fallowfield (Twp.)	77	58	11	14.3%	9	15.5%
East Goshen (Twp.)	76	43	15	19.7%	13	30.2%





Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 1 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
East Marlborough (Twp.)	53	34	7	13.2%	5	14.7%
East Nantmeal (Twp.)	31	25	12	38.7%	9	36.0%
East Nottingham (Twp.)	46	37	15	32.6%	15	40.5%
East Pikeland (Twp.)	50	35	16	32.0%	16	45.7%
East Vincent (Twp.)	60	40	16	26.7%	15	37.5%
East Whiteland (Twp.)	185	100	31	16.8%	26	26.0%
Easttown (Twp.)	69	37	7	10.1%	4	10.8%
Elk (Twp.)	18	17	12	66.7%	12	70.6%
Elverson (B)	13	5	0	0.0%	0	0.0%
Franklin (Twp.)	29	23	9	31.0%	9	39.1%
Highland (Twp.)	24	18	6	25.0%	5	27.8%
Honey Brook (B)	17	11	0	0.0%	0	0.0%
Honey Brook (Twp.)	45	26	15	33.3%	13	50.0%
Kennett (Twp.)	81	56	18	22.2%	15	26.8%
Kennett Square (B)	42	25	4	9.5%	4	16.0%
London Britain (Twp.)	22	20	8	36.4%	8	40.0%
London Grove (Twp.)	77	60	19	24.7%	19	31.7%
Londonderry (Twp.)	23	18	6	26.1%	6	33.3%
Lower Oxford (Twp.)	57	46	19	33.3%	19	41.3%
Malvern (B)	29	18	3	10.3%	0	0.0%
Modena (B)	11	8	3	27.3%	1	12.5%
New Garden (Twp.)	97	53	11	11.3%	7	13.2%
New London (Twp.)	21	18	10	47.6%	10	55.6%
Newlin (Twp.)	34	33	17	50.0%	16	48.5%
North Coventry (Twp.)	63	40	15	23.8%	12	30.0%





Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 1 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Oxford (B)	52	24	1	1.9%	1	4.2%
Parkensburg (B)	36	23	6	16.7%	4	17.4%
Penn (Twp.)	45	29	9	20.0%	9	31.0%
Pennsbury (Twp.)	46	34	12	26.1%	9	26.5%
Phoenixville (B)	88	54	15	17.0%	14	25.9%
Pocopson (Twp.)	40	35	17	42.5%	16	45.7%
Sadsbury (Twp.)	46	28	7	15.2%	7	25.0%
Schuylkill (Twp.)	75	45	12	16.0%	11	24.4%
South Coatesville (B)	22	12	2	9.1%	2	16.7%
South Coventry (Twp.)	43	36	12	27.9%	12	33.3%
Spring City (B)	17	10	4	23.5%	1	10.0%
Thornbury (Twp.)	21	18	7	33.3%	7	38.9%
Tredyffrin (Twp.)	303	186	32	10.6%	32	17.2%
Upper Oxford (Twp.)	27	19	9	33.3%	9	47.4%
Upper Uwchlan (Twp.)	61	43	9	14.8%	8	18.6%
Uwchlan (Twp.)	110	47	4	3.6%	4	8.5%
Valley (Twp.)	60	43	12	20.0%	11	25.6%
Wallace (Twp.)	34	31	13	38.2%	13	41.9%
Warwick (Twp.)	46	35	14	30.4%	13	37.1%
West Bradford (Twp.)	60	44	16	26.7%	15	34.1%
West Brandywine (Twp.)	49	39	17	34.7%	16	41.0%
West Caln (Twp.)	39	27	6	15.4%	6	22.2%
West Chester (B)	100	59	3	3.0%	1	1.7%
West Fallowfield (Twp.)	31	24	10	32.3%	10	41.7%
West Goshen (Twp.)	178	99	20	11.2%	15	15.2%





Jurisdiction	Total Critical Facilities Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 1 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
West Grove (B)	18	10	0	0.0%	0	0.0%
West Marlborough (Twp.)	27	24	15	55.6%	14	58.3%
West Nantmeal (Twp.)	31	21	12	38.7%	11	52.4%
West Nottingham (Twp.)	28	16	6	21.4%	6	37.5%
West Pikeland (Twp.)	44	39	16	36.4%	15	38.5%
West Sadsbury (Twp.)	37	19	6	16.2%	6	31.6%
West Vincent (Twp.)	47	39	14	29.8%	13	33.3%
West Whiteland (Twp.)	217	149	37	17.1%	32	21.5%
Westtown (Twp.)	46	31	10	21.7%	9	29.0%
Willistown (Twp.)	90	49	24	26.7%	12	24.5%
Chester County (Total)	4,202	2,783	863	20.5%	765	27.5%

Source: Chester County GIS 2020, FEMA 2017

Note: B – Borough; C – City; Twp. – Township

Table 4.3.7-18 Critical Facility Types Located in the 0.2 Percent Annual Chance Event Floodplain and Estimated Damage

Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 0.2 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Atglen (B)	20	17	8	40.0%	8	47.1%
Avondale (B)	19	15	7	36.8%	5	33.3%
Birmingham (Twp.)	34	26	11	32.4%	8	30.8%
Caln (Twp.)	101	70	18	17.8%	17	24.3%
Charlestown (Twp.)	64	45	16	25.0%	16	35.6%
Coatesville (C)	79	45	12	15.2%	9	20.0%
Downingtown (B)	86	53	12	14.0%	8	15.1%
East Bradford (Twp.)	73	61	30	41.1%	28	45.9%





Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 0.2 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
East Brandywine (Twp.)	49	40	19	38.8%	17	42.5%
East Caln (Twp.)	64	29	8	12.5%	5	17.2%
East Coventry (Twp.)	49	37	22	44.9%	19	51.4%
East Fallowfield (Twp.)	77	58	14	18.2%	11	19.0%
East Goshen (Twp.)	76	43	15	19.7%	13	30.2%
East Marlborough (Twp.)	53	34	7	13.2%	5	14.7%
East Nantmeal (Twp.)	31	25	12	38.7%	9	36.0%
East Nottingham (Twp.)	46	37	15	32.6%	15	40.5%
East Pikeland (Twp.)	50	35	17	34.0%	17	48.6%
East Vincent (Twp.)	60	40	16	26.7%	15	37.5%
East Whiteland (Twp.)	185	100	31	16.8%	26	26.0%
Easttown (Twp.)	69	37	7	10.1%	4	10.8%
Elk (Twp.)	18	17	12	66.7%	12	70.6%
Elverson (B)	13	5	0	0.0%	0	0.0%
Franklin (Twp.)	29	23	9	31.0%	9	39.1%
Highland (Twp.)	24	18	6	25.0%	5	27.8%
Honey Brook (B)	17	11	0	0.0%	0	0.0%
Honey Brook (Twp.)	45	26	15	33.3%	13	50.0%
Kennett (Twp.)	81	56	22	27.2%	19	33.9%
Kennett Square (B)	42	25	8	19.0%	6	24.0%
London Britain (Twp.)	22	20	8	36.4%	8	40.0%
London Grove (Twp.)	77	60	22	28.6%	22	36.7%
Londonderry (Twp.)	23	18	7	30.4%	6	33.3%
Lower Oxford (Twp.)	57	46	19	33.3%	19	41.3%
Malvern (B)	29	18	3	10.3%	0	0.0%





Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 0.2 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Modena (B)	11	8	4	36.4%	2	25.0%
New Garden (Twp.)	97	53	11	11.3%	7	13.2%
New London (Twp.)	21	18	10	47.6%	10	55.6%
Newlin (Twp.)	34	33	17	50.0%	16	48.5%
North Coventry (Twp.)	63	40	16	25.4%	13	32.5%
Oxford (B)	52	24	1	1.9%	1	4.2%
Parkesburg (B)	36	23	7	19.4%	5	21.7%
Penn (Twp.)	45	29	9	20.0%	9	31.0%
Pennsbury (Twp.)	46	34	12	26.1%	9	26.5%
Phoenixville (B)	88	54	19	21.6%	16	29.6%
Pocopson (Twp.)	40	35	18	45.0%	17	48.6%
Sadsbury (Twp.)	46	28	7	15.2%	7	25.0%
Schuylkill (Twp.)	75	45	12	16.0%	11	24.4%
South Coatesville (B)	22	12	2	9.1%	2	16.7%
South Coventry (Twp.)	43	36	12	27.9%	12	33.3%
Spring City (B)	17	10	8	47.1%	4	40.0%
Thornbury (Twp.)	21	18	7	33.3%	7	38.9%
Tredyffrin (Twp.)	303	186	32	10.6%	32	17.2%
Upper Oxford (Twp.)	27	19	9	33.3%	9	47.4%
Upper Uwchlan (Twp.)	61	43	9	14.8%	8	18.6%
Uwchlan (Twp.)	110	47	4	3.6%	4	8.5%
Valley (Twp.)	60	43	13	21.7%	12	27.9%
Wallace (Twp.)	34	31	13	38.2%	13	41.9%
Warwick (Twp.)	46	35	14	30.4%	13	37.1%
West Bradford (Twp.)	60	44	18	30.0%	16	36.4%





Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Exposed to 0.2 Percent Annual Chance Flood			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
West Brandywine (Twp.)	49	39	17	34.7%	16	41.0%
West Caln (Twp.)	39	27	6	15.4%	6	22.2%
West Chester (B)	100	59	3	3.0%	1	1.7%
West Fallowfield (Twp.)	31	24	10	32.3%	10	41.7%
West Goshen (Twp.)	178	99	22	12.4%	15	15.2%
West Grove (B)	18	10	0	0.0%	0	0.0%
West Marlborough (Twp.)	27	24	16	59.3%	15	62.5%
West Nantmeal (Twp.)	31	21	12	38.7%	11	52.4%
West Nottingham (Twp.)	28	16	6	21.4%	6	37.5%
West Pikeland (Twp.)	44	39	18	40.9%	17	43.6%
West Sadsbury (Twp.)	37	19	6	16.2%	6	31.6%
West Vincent (Twp.)	47	39	14	29.8%	13	33.3%
West Whiteland (Twp.)	217	149	44	20.3%	39	26.2%
Westtown (Twp.)	46	31	12	26.1%	9	29.0%
Willistown (Twp.)	90	49	25	27.8%	13	26.5%
Chester County (Total)	4,202	2,783	923	22.0%	806	29.0%

Source: Chester County GIS 2020, FEMA 2017

Note: B – Borough; C – City; Twp. – Township; % – Percent



Impact on the Economy

For impact on the economy, estimated losses from a flood event are considered. Losses include but are not limited to general building stock damage, agricultural losses, business interruption, and impacts on tourism and tax base within Chester County. Damage to general building stock can be quantified by use of Hazus as discussed above. Other economic components such as loss of facility use, functional downtime, and social economic factors are less susceptible to measurement with a high degree of certainty. In areas that are directly flooded, renovations of commercial and industrial buildings may be necessary, disrupting associated services.

Hazus estimates the amount of debris generated from a 1 percent annual chance flood event. The model breaks down debris into three categories because of the different types of equipment needed to handle debris: (1) finishes (dry wall, insulation, etc.), (2) structural (wood, brick, etc.), and (3) foundations (concrete slab and block, rebar, etc.). Table 4.3.7-19 summarizes the debris Hazus estimates to result from a 1 percent annual chance flood event, which is more than 28,000 tons of debris. Notably, this table lists estimated debris generated only by riverine flooding and does not include additional potential damage and debris possibly generated by force of wind.

Table 4.3.7-19. Estimated Debris Generated from the 1 Percent Annual Chance Flood Event

Jurisdiction	1 Percent Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Atglen (B)	18	18	0	0
Avondale (B)	532	492	24	17
Birmingham (Twp.)	293	148	82	63
Caln (Twp.)	480	309	85	86
Charlestown (Twp.)	388	157	129	103
Coatesville (C)	60	54	4	2
Downingtown (B)	676	673	2	1
East Bradford (Twp.)	691	336	204	151
East Brandywine (Twp.)	639	315	186	138
East Caln (Twp.)	41	8	18	15
East Coventry (Twp.)	1,255	606	347	301
East Fallowfield (Twp.)	218	76	80	62
East Goshen (Twp.)	329	220	61	48
East Marlborough (Twp.)	415	280	80	54
East Nantmeal (Twp.)	143	79	35	28
East Nottingham (Twp.)	277	160	64	52
East Pikeland (Twp.)	480	273	123	84
East Vincent (Twp.)	232	144	51	37
East Whiteland (Twp.)	1,084	381	394	309
Easttown (Twp.)	223	173	29	20
Elk (Twp.)	213	83	71	60
Elverson (B)	5	5	0	0
Franklin (Twp.)	569	166	226	177
Highland (Twp.)	117	62	30	24
Honey Brook (B)	0	0	0	0



Section 4.3.7: Risk Assessment – Flood, Flash Flood, Ice Jam

Jurisdiction	1 Percent Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Honey Brook (Twp.)	355	263	43	49
Kennett (Twp.)	482	353	77	52
Kennett Square (B)	132	123	5	4
London Britain (Twp.)	383	114	150	119
London Grove (Twp.)	350	196	66	89
Londonderry (Twp.)	117	66	29	22
Lower Oxford (Twp.)	401	178	122	101
Malvern (B)	147	51	54	42
Modena (B)	599	256	188	155
New Garden (Twp.)	309	170	76	64
New London (Twp.)	98	38	33	27
Newlin (Twp.)	979	401	324	255
North Coventry (Twp.)	2,027	947	613	467
Oxford (B)	32	18	8	6
Parkesburg (B)	73	49	15	9
Penn (Twp.)	103	47	23	33
Pennsbury (Twp.)	111	78	20	14
Phoenixville (B)	416	327	54	35
Pocopson (Twp.)	626	208	254	164
Sadsbury (Twp.)	238	136	53	49
Schuylkill (Twp.)	2,001	206	1,023	772
South Coatesville (B)	3	1	1	1
South Coventry (Twp.)	125	39	48	38
Spring City (B)	413	251	92	70
Thornbury (Twp.)	93	68	15	10
Tredyffrin (Twp.)	673	469	123	80
Upper Oxford (Twp.)	247	85	88	74
Upper Uwchlan (Twp.)	237	90	84	63
Uwchlan (Twp.)	54	17	21	16
Valley (Twp.)	319	195	70	54
Wallace (Twp.)	230	54	99	77
Warwick (Twp.)	375	233	80	62
West Bradford (Twp.)	1,086	336	417	334
West Brandywine (Twp.)	123	71	28	24
West Caln (Twp.)	466	198	135	134
West Chester (B)	172	160	7	5
West Fallowfield (Twp.)	247	163	49	35
West Goshen (Twp.)	1,500	827	394	280
West Grove (B)	0	0	0	0



Jurisdiction	1 Percent Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
West Marlborough (Twp.)	475	234	131	109
West Nantmeal (Twp.)	93	53	20	20
West Nottingham (Twp.)	197	78	56	64
West Pikeland (Twp.)	212	157	33	23
West Sadsbury (Twp.)	218	150	33	35
West Vincent (Twp.)	141	81	35	25
West Whiteland (Twp.)	1,061	377	379	305
Westtown (Twp.)	179	163	10	7
Willistown (Twp.)	1,291	671	352	268
Chester County (Total)	29,588	14,669	8,350	6,570

Sources: HAZUSv4.2; FEMA 2012, Chester County GIS 2020; RS Means 2019
 Note: B – Borough; C – City; Twp. – Township; % – Percent

Impact on the Environment

As Chester County and its jurisdictions evolve with changes in population and density, flood events may increase in frequency and/or severity as land use changes, more structures are built, and impervious surfaces expand. Flood extents for the 1 percent and 0.2 percent annual chance flood event will continue to evolve alongside natural occurrences such as climate change and/or severe weather events. These flood events will inevitably impact Chester County’s natural and local environment.

Furthermore, the environmental impacts of a dam failure event can include significant water quality and debris disposal issues. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties. In addition, severe erosion is likely; such erosion can negatively impact local ecosystems.

The acreage of natural land makes up about 37.5 percent of the county’s total land area (NLCD 2016). Natural land areas from the 2016 land use type dataset includes areas of forested land and wetlands. Overall, 11.8 percent and 12.5 percent of the natural land area in the county is exposed to the 1 percent and 0.2 percent annual chance flood event boundaries, respectively. Severe flooding will affect these natural areas and can ultimately be disruptive to species that reside in these natural habitats.

Cascading Impacts on Other Hazards

Flood events can exacerbate the impacts of disease outbreak and utility failure. After a flooding event, runoff can pick up and transport pollutants from wildlife and soils. Such organisms can then appear in drinking water facilities and transmit water-borne illnesses and vector diseases to the population (WHO, 2020). Water containing debris can trigger utility failure by clogging treatment systems or inundating power sources. More information about these hazards of concern is provided in Section 4.3.18 (Utility Interruption) and Section 4.3.12 (Pandemic and Infectious Disease).



Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Future Growth and Development

Any areas of growth could be impacted by the flood hazard if within identified hazard areas. The tables and hazard maps included in the jurisdictional annexes contain additional information regarding the specific areas of development that would increase county vulnerability to dam inundation areas.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicate that Chester County's population will continue to increase into 2040, expanding the total population to approximately 603,068 persons (The Center of Rural Pennsylvania 2013). As more people move into flood zones, an increased amount of the population will be vulnerable to flood hazards.

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by type, frequency, and intensity of weather events. Both globally and at the local scale, climate change can alter prevalence and severity of extremes such as flood events. While predicting changes of flood events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment (U.S. Environmental Protection Agency [EPA] 2006).

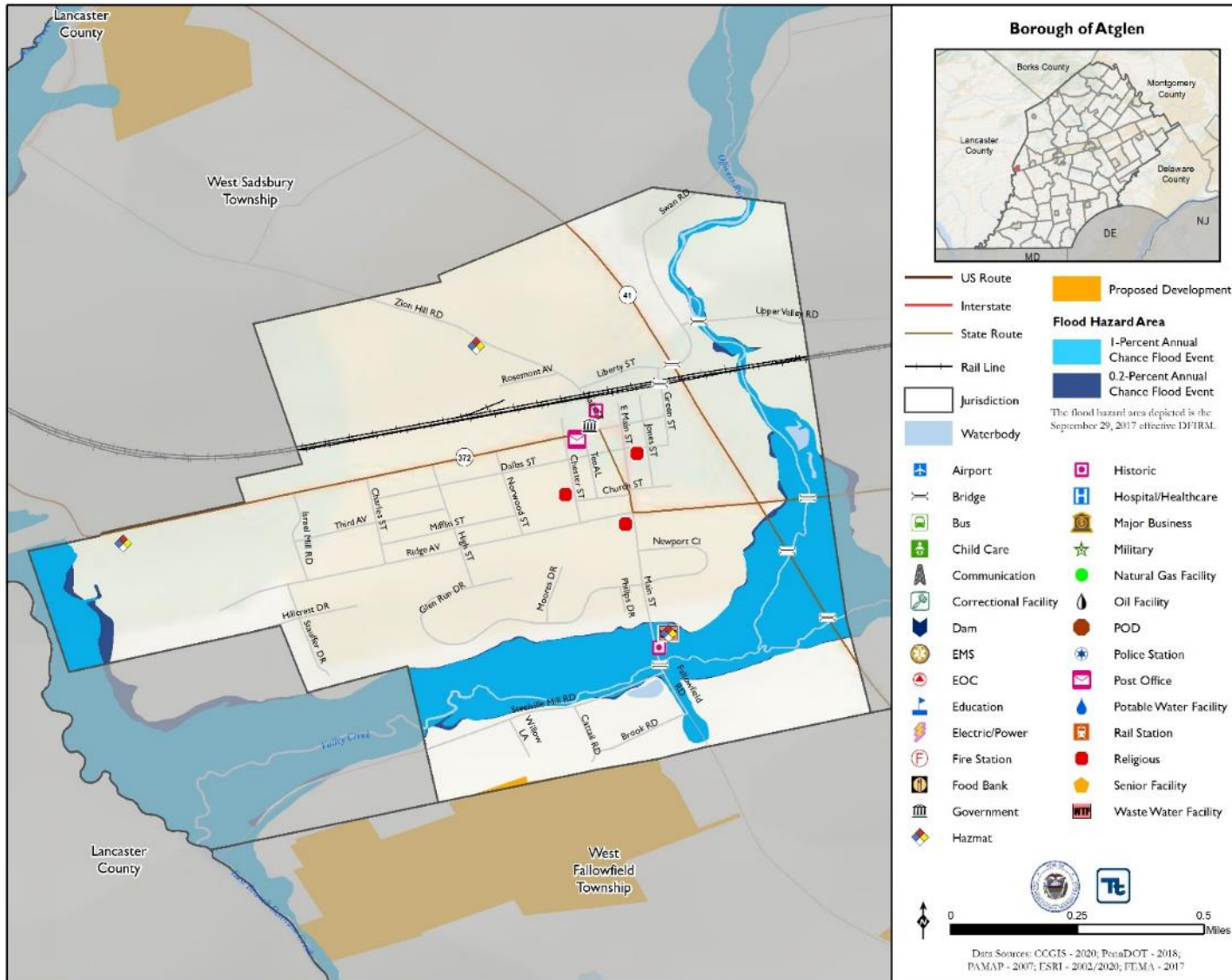
PADEP was directed by the Climate Change Act (Act 70 of 2008) to initiate a study of potential impacts of global climate change on the Commonwealth. The June 2009 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures in the 21st century (PADEP 2009). An increase in variability of temperature and precipitation may lead to increased frequency and/or severity of storm events. Summer floods and general stream flow variability are projected to increase because of increased variability in precipitation. Even with the anticipated increase in winter precipitation as rain rather than snow, increased winter temperatures and a reduced snowpack may decrease rain-on-snow events and thus major flooding events in Pennsylvania. This conclusion, however, remains speculative until further studies can validate it. Future improvements in modeling smaller-scale climatic processes are expected and will lead to improved understanding of how the changing climate will alter temperature, precipitation, storms, and flood events in Pennsylvania (PADEP 2009).

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also established using 2019 RS Means building valuations that estimated replacement cost value for each building in the inventory. Additionally, a critical facility dataset was provided from the county. A Hazus riverine flood analysis of Chester County was based on the most current and best available data, including building and critical facility inventories, and FEMA DFIRMs. Section 6 (Mitigation Strategy) of this HMP includes discussions of specific mitigation actions addressing improved data collection, and further vulnerability analysis.

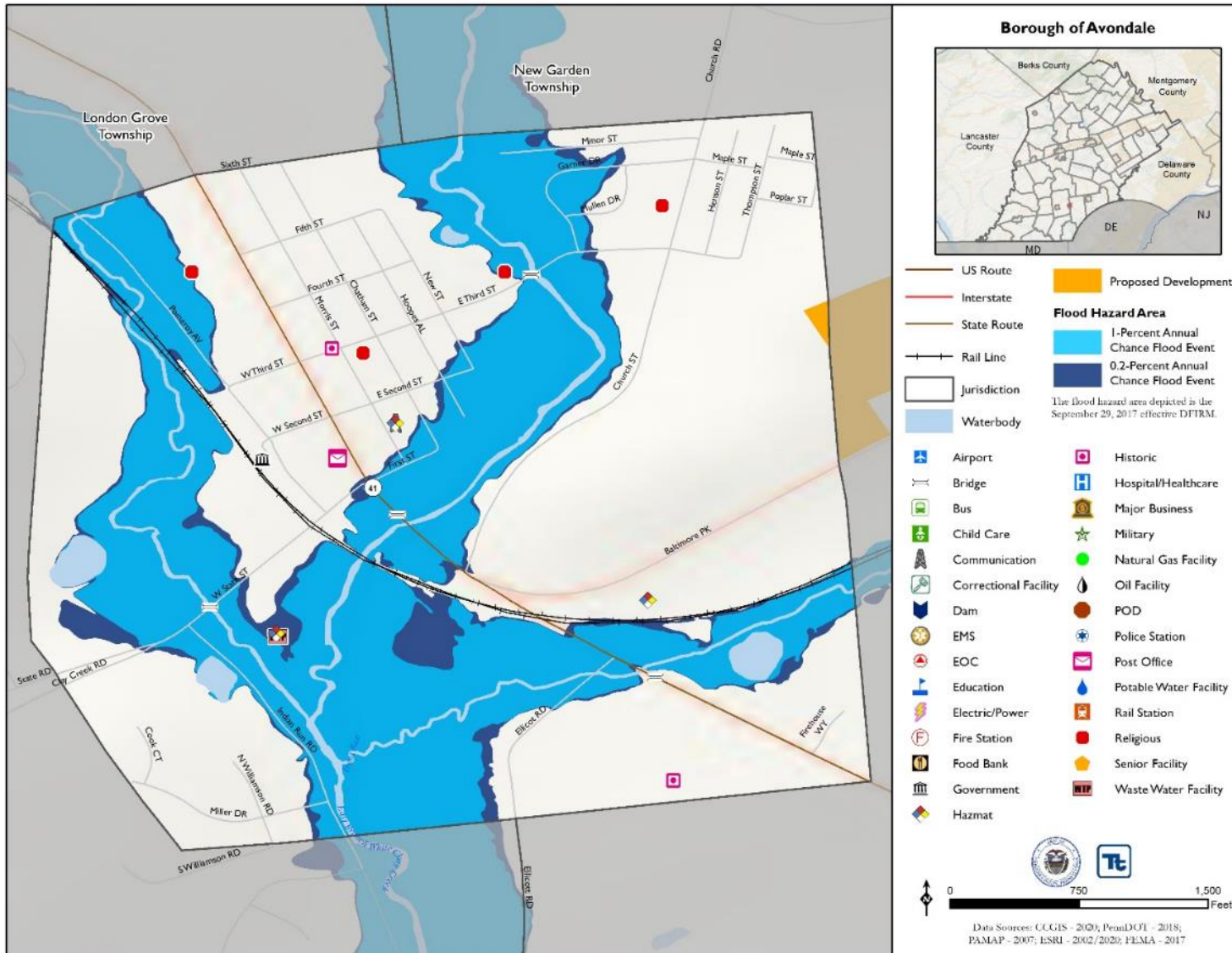


Atglen Borough



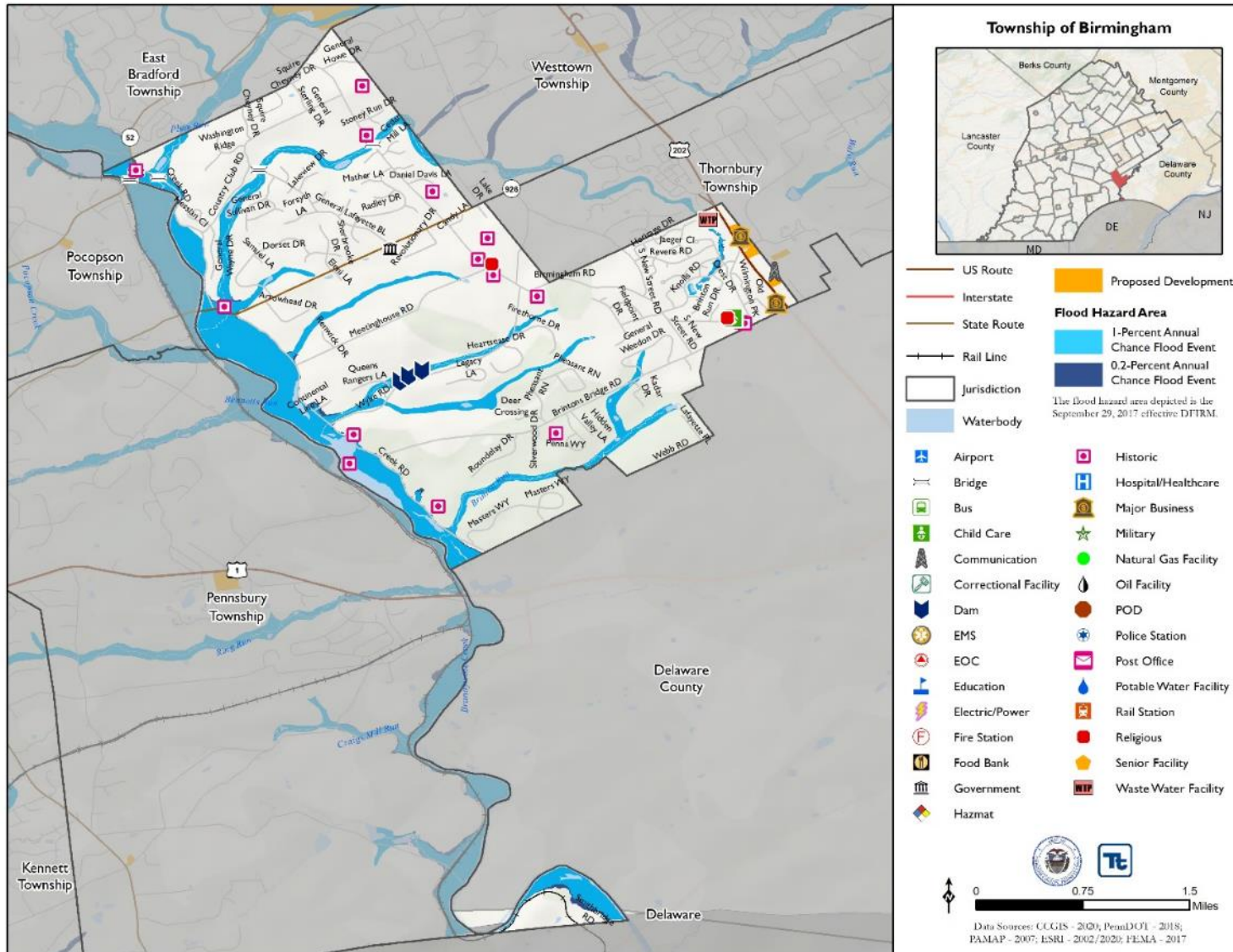


Avondale Borough



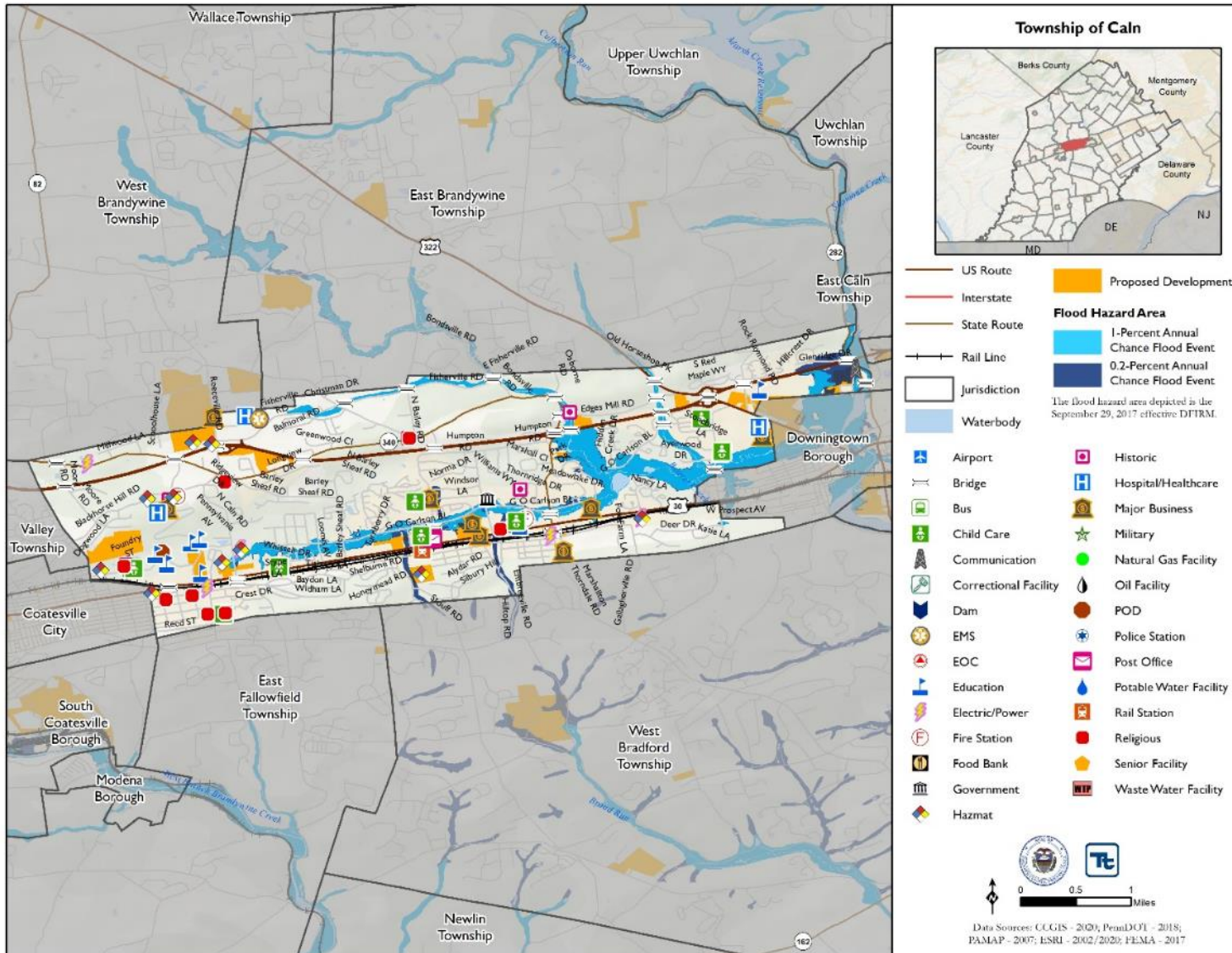


Birmingham Township



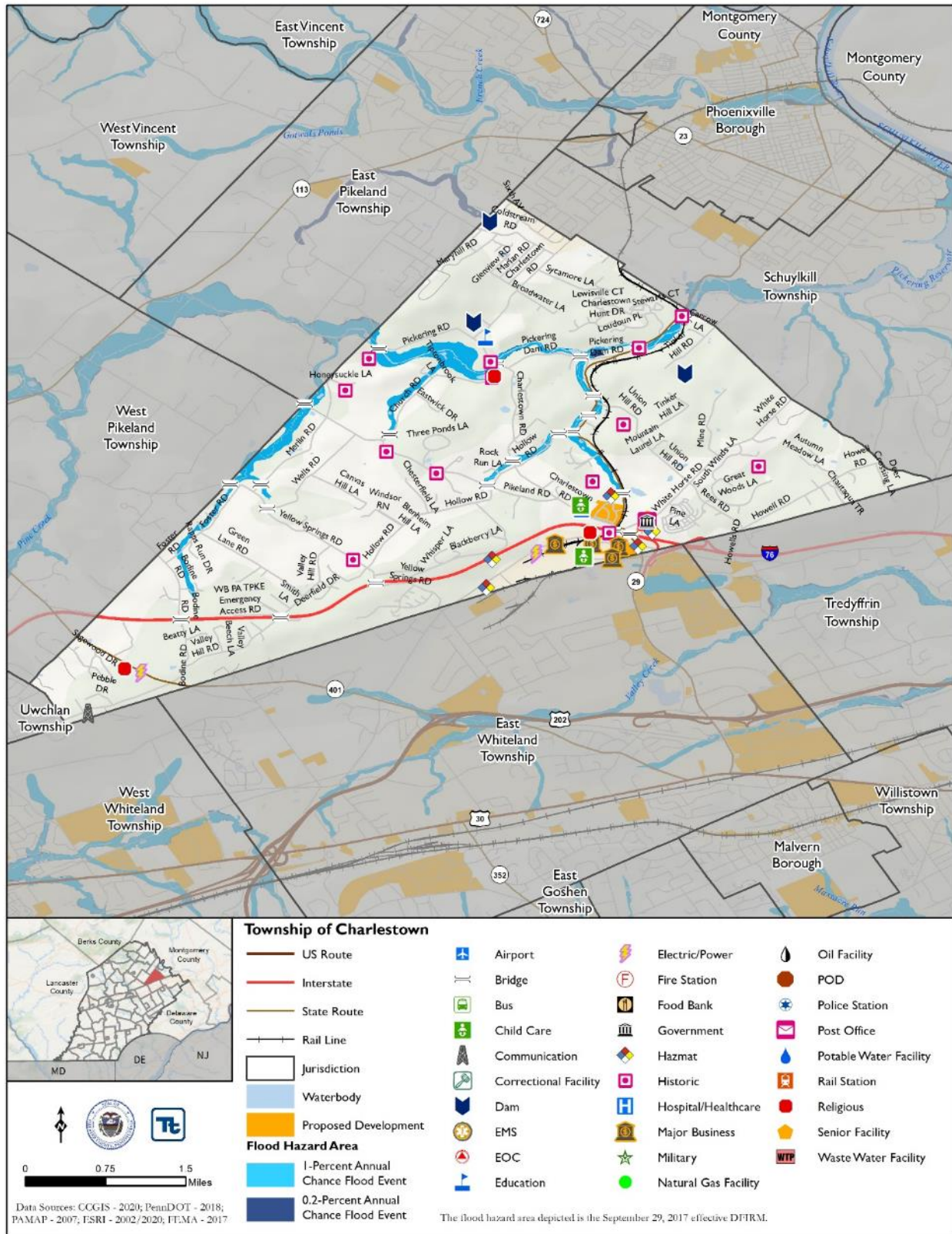


Calm Township



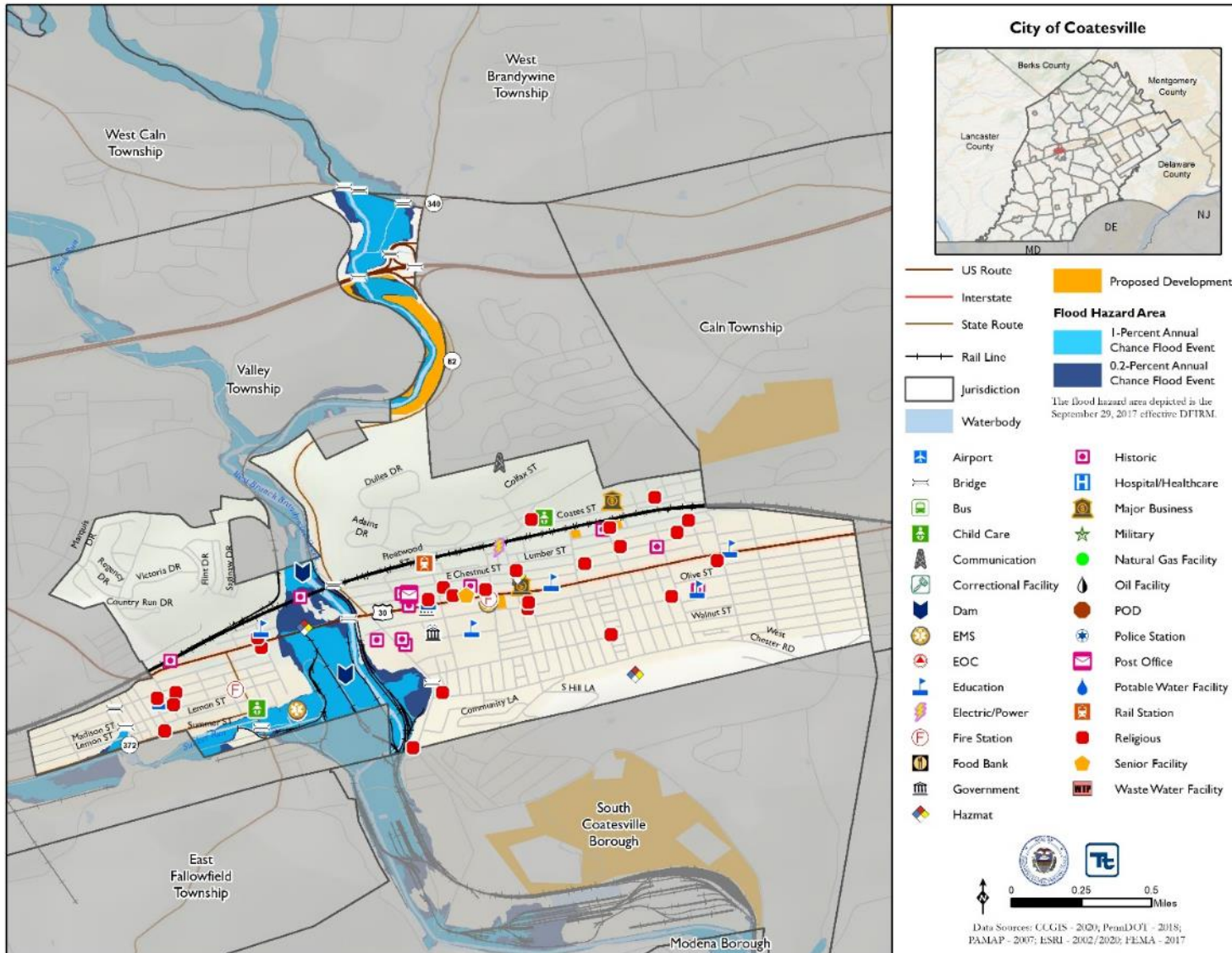


Charlestown Township



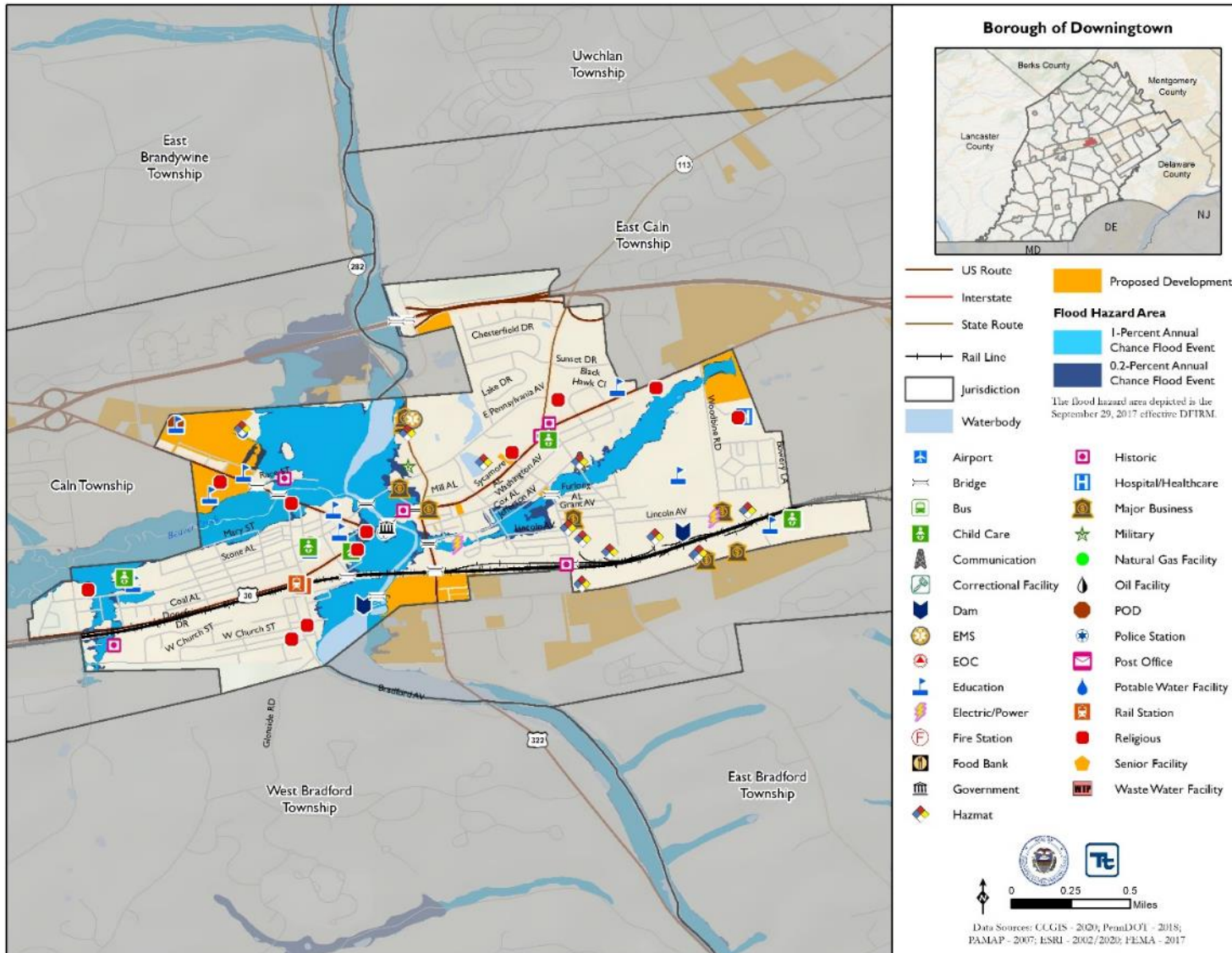


City of Coatesville



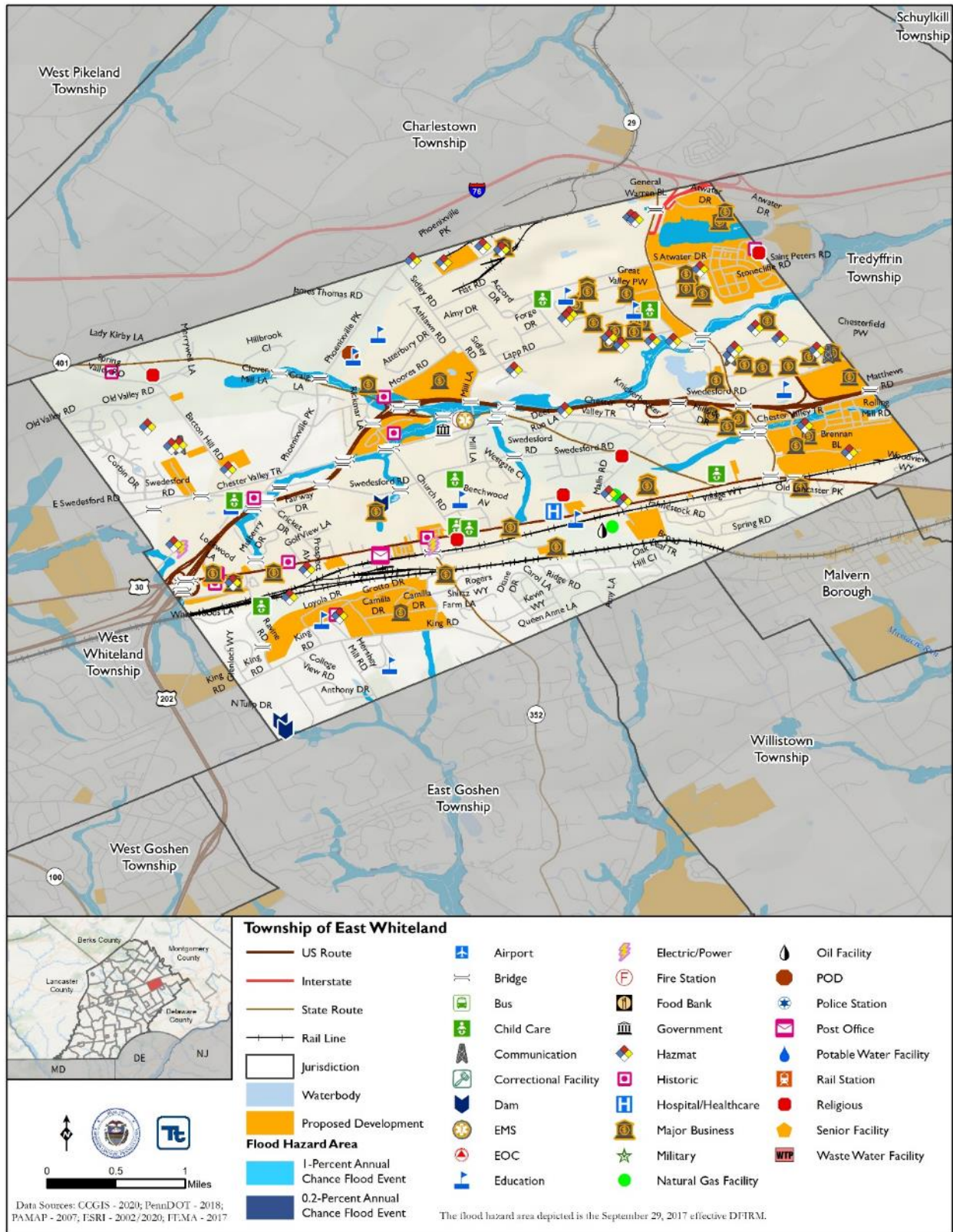


Downingtown Borough



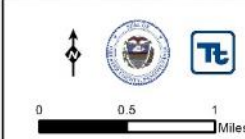
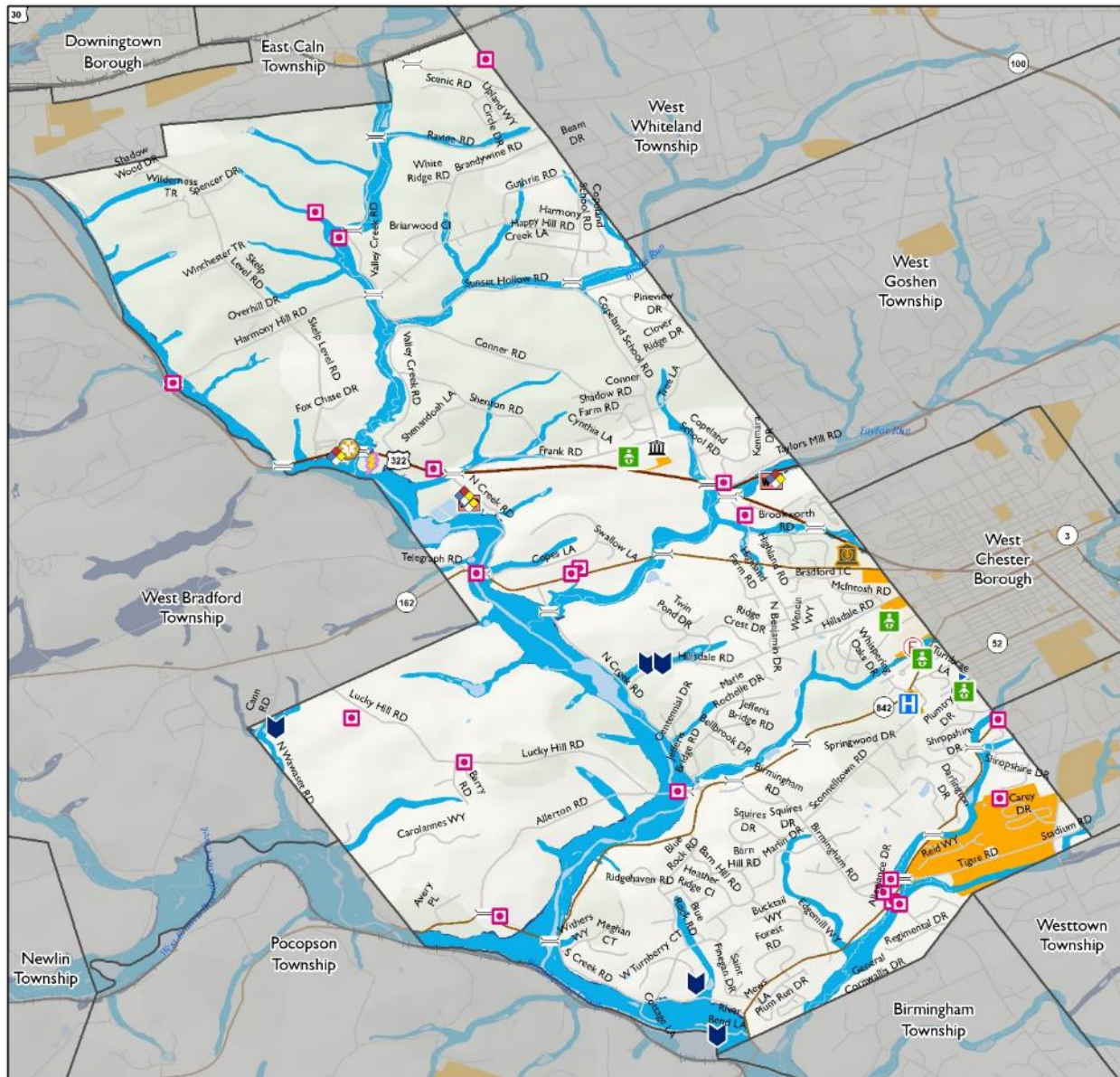


East Whiteland Township





East Bradford Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FEMA - 2017

Township of East Bradford

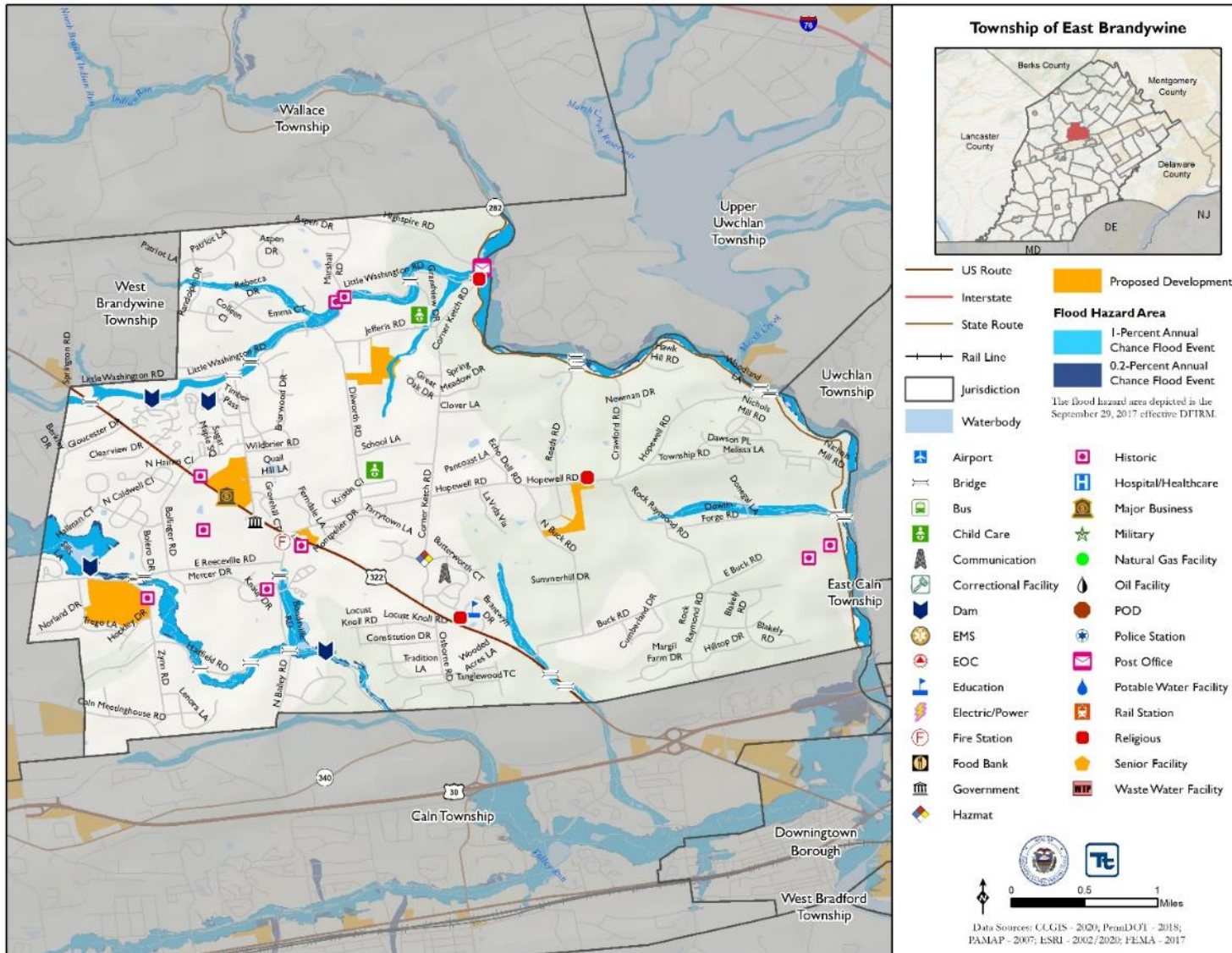
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Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
1-Percent Annual Chance Flood Event	EMS	Military	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
	Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



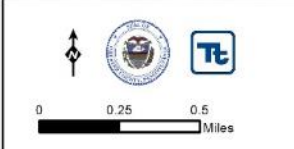
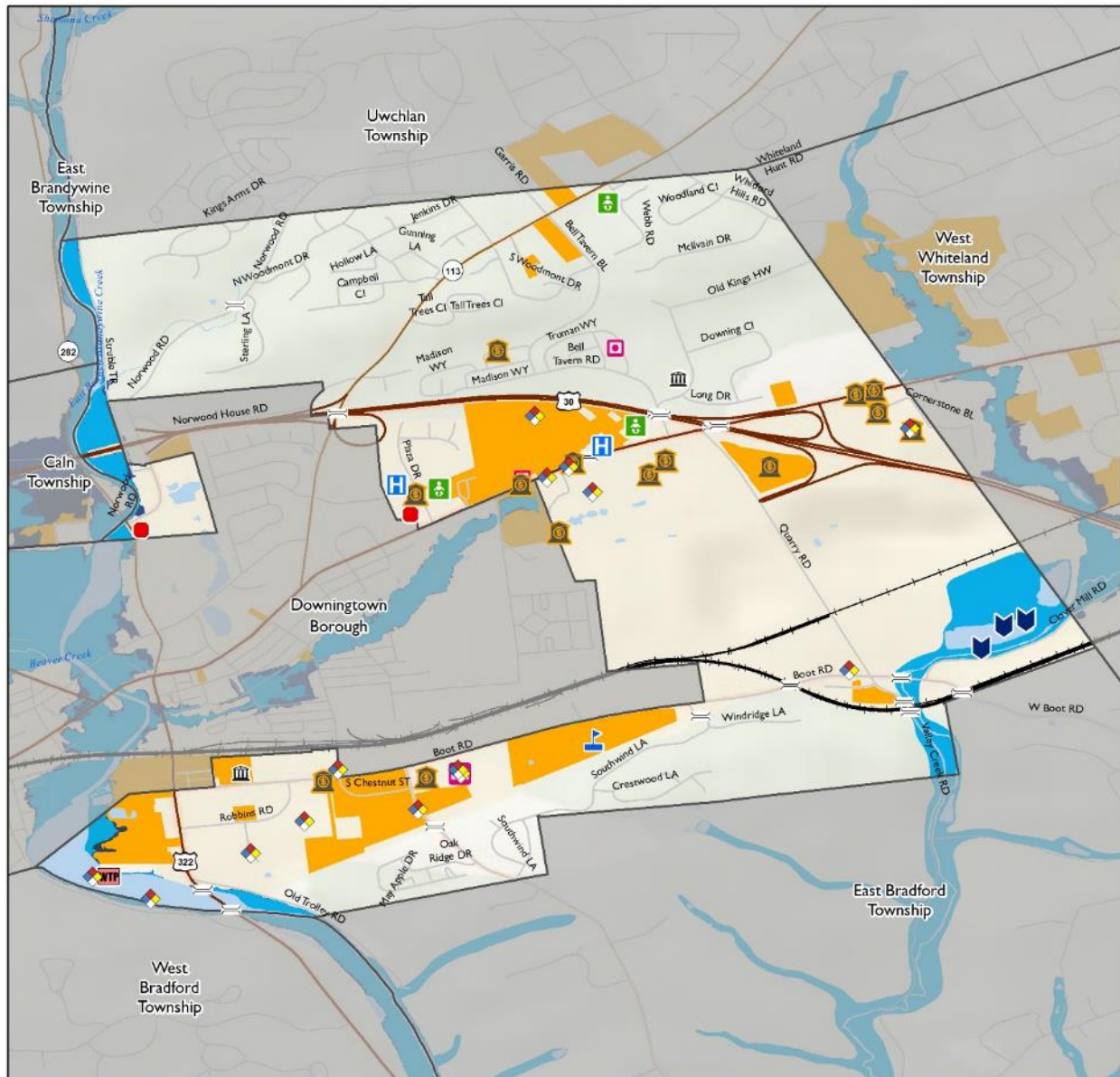


East Brandywine Township





East Caln Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT,MA - 2017

Township of East Caln

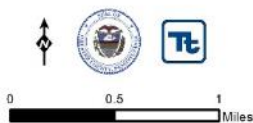
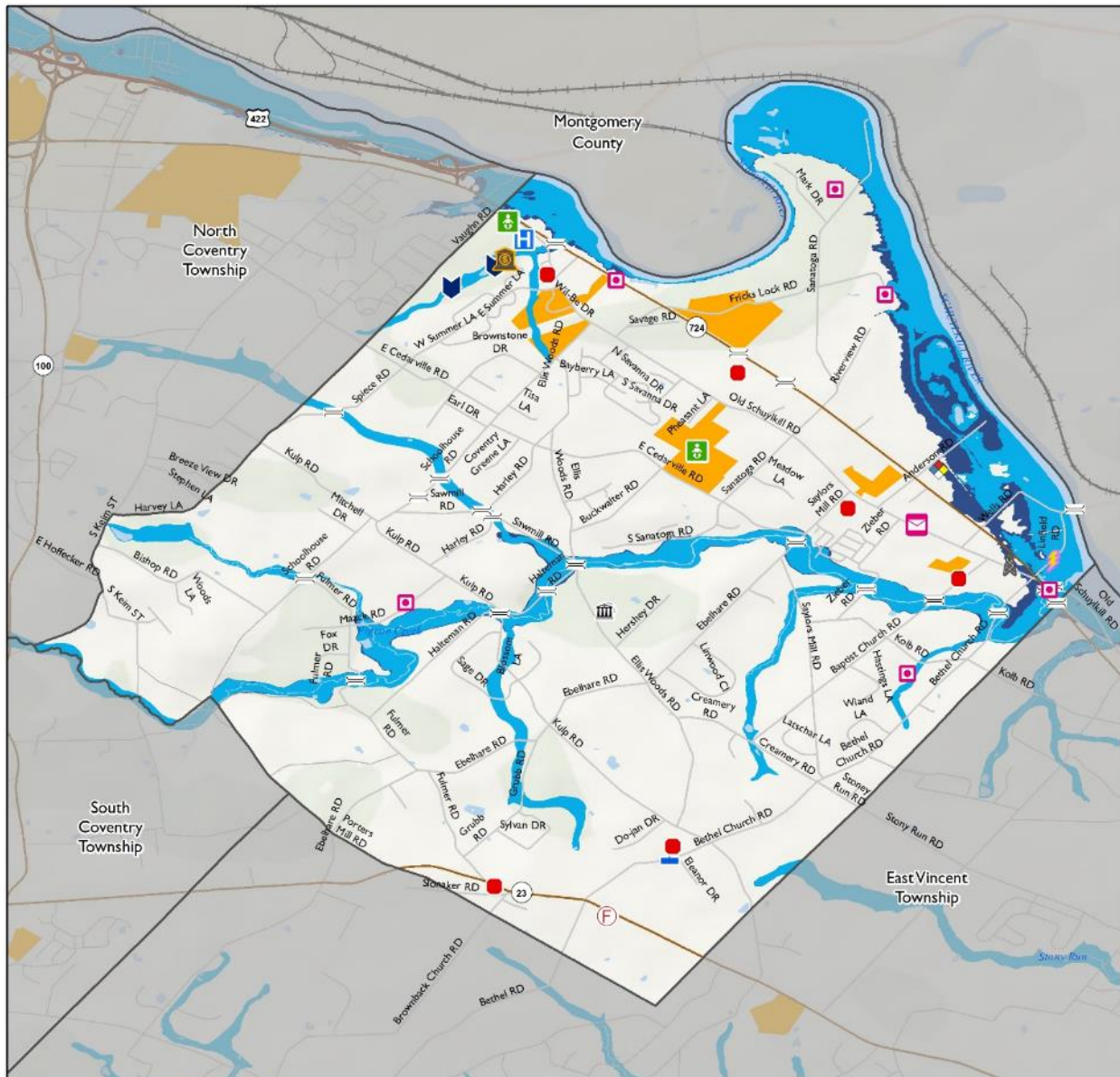
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

Airport	Electric/Power	Oil Facility
Bridge	Fire Station	POD
Bus	Food Bank	Police Station
Child Care	Government	Post Office
Communication	Hazmat	Potable Water Facility
Correctional Facility	Hospital/Healthcare	Rail Station
Dam	Major Business	Religious
EMS	Military	Senior Facility
EOC	Natural Gas Facility	Waste Water Facility
Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



East Coventry Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

Township of East Coventry

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

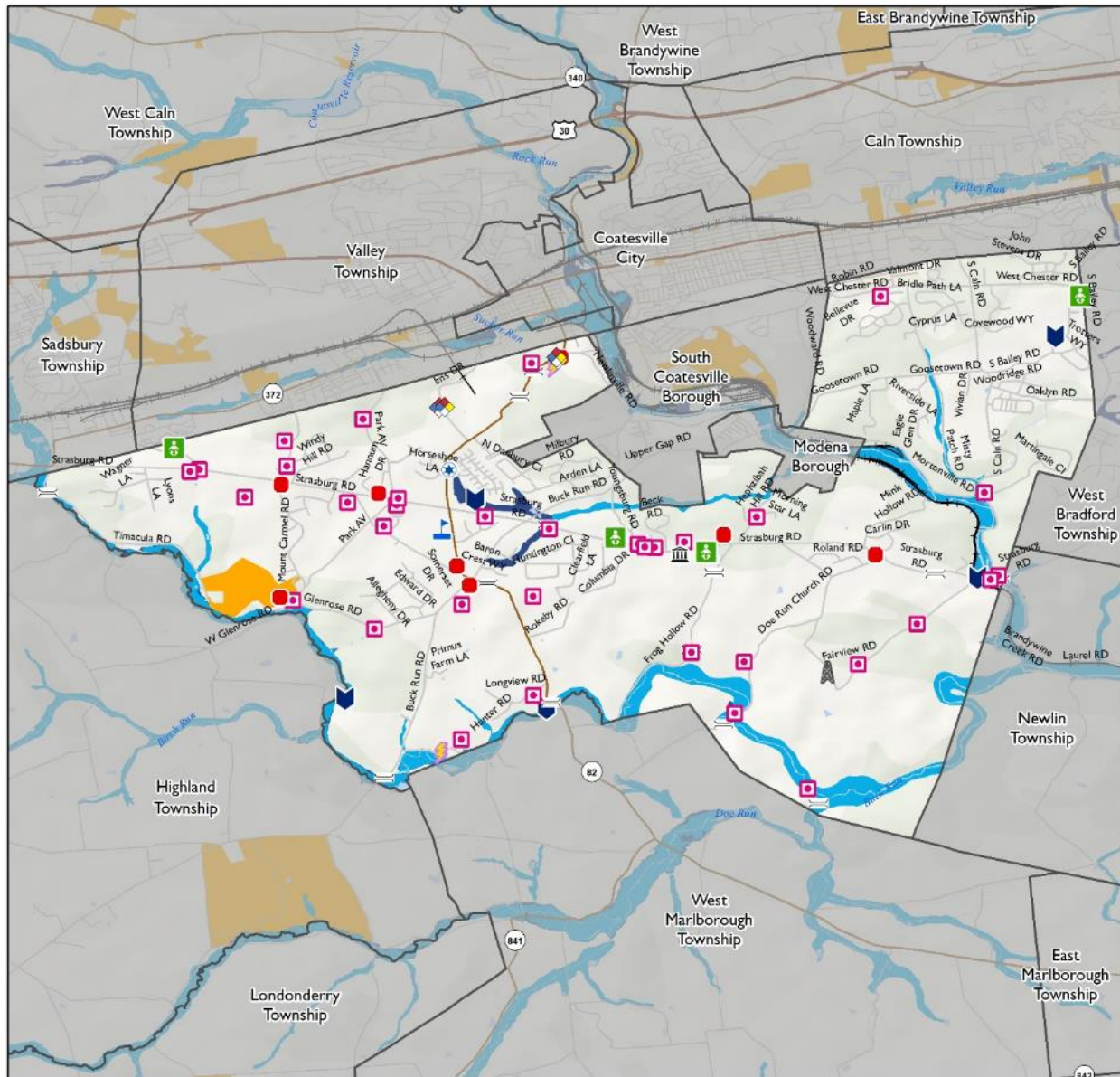
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|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.





East Fallowfield Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of East Fallowfield

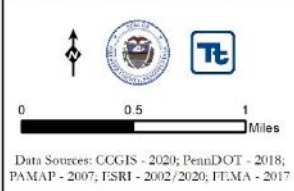
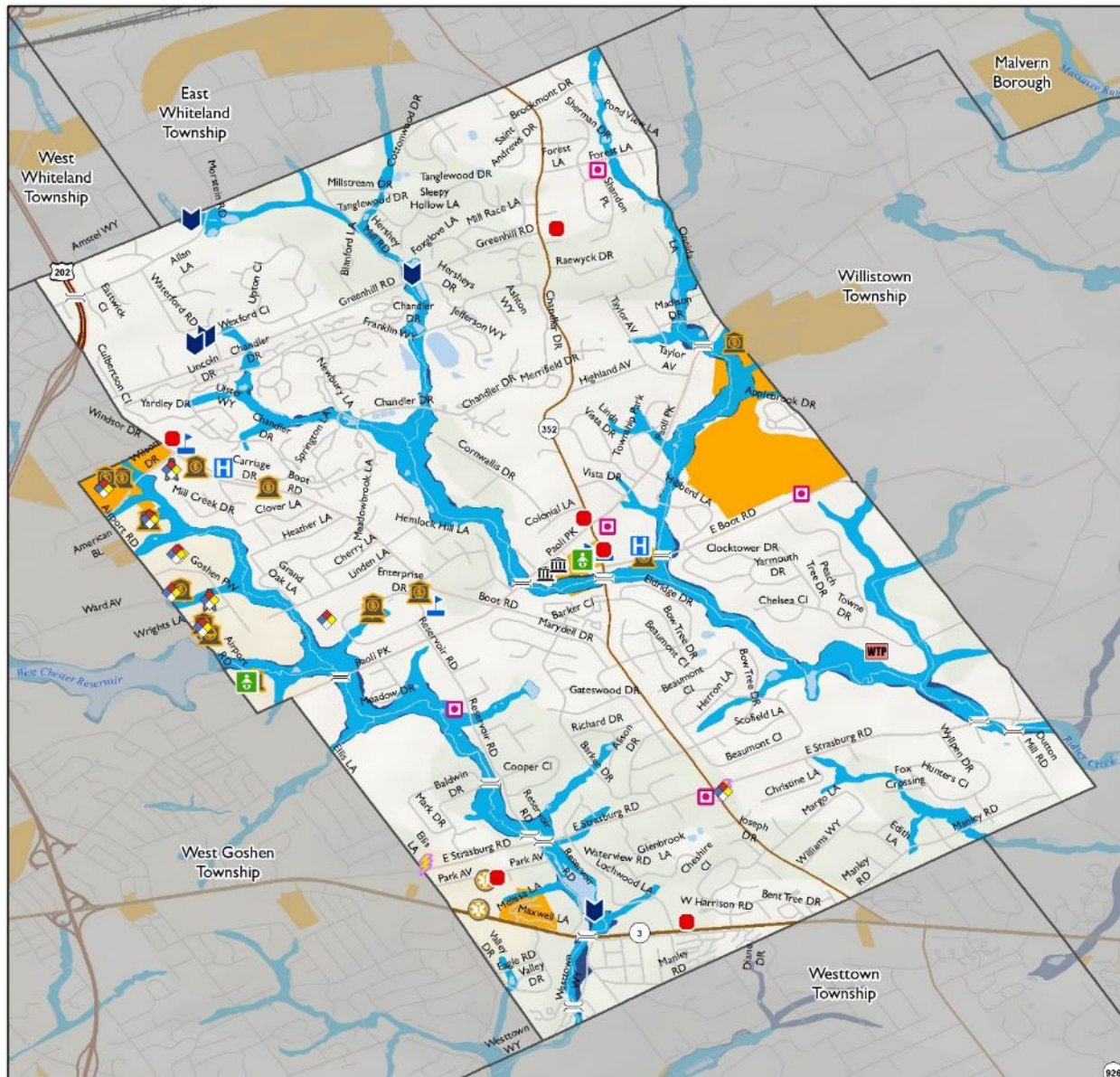
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
1-Percent Annual Chance Flood Event	EMS	Military	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
	Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.





East Goshen Township



Township of East Goshen

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

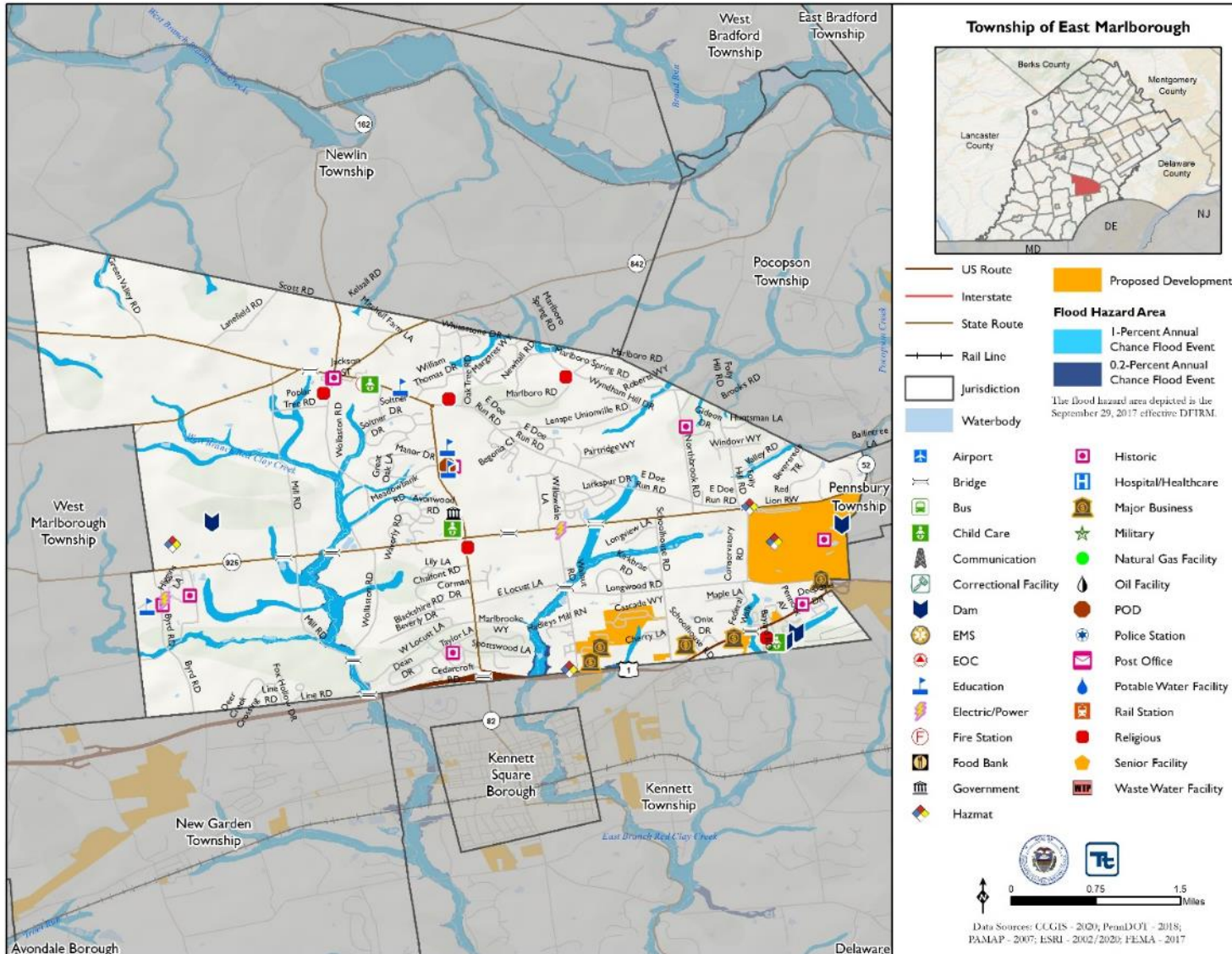
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| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



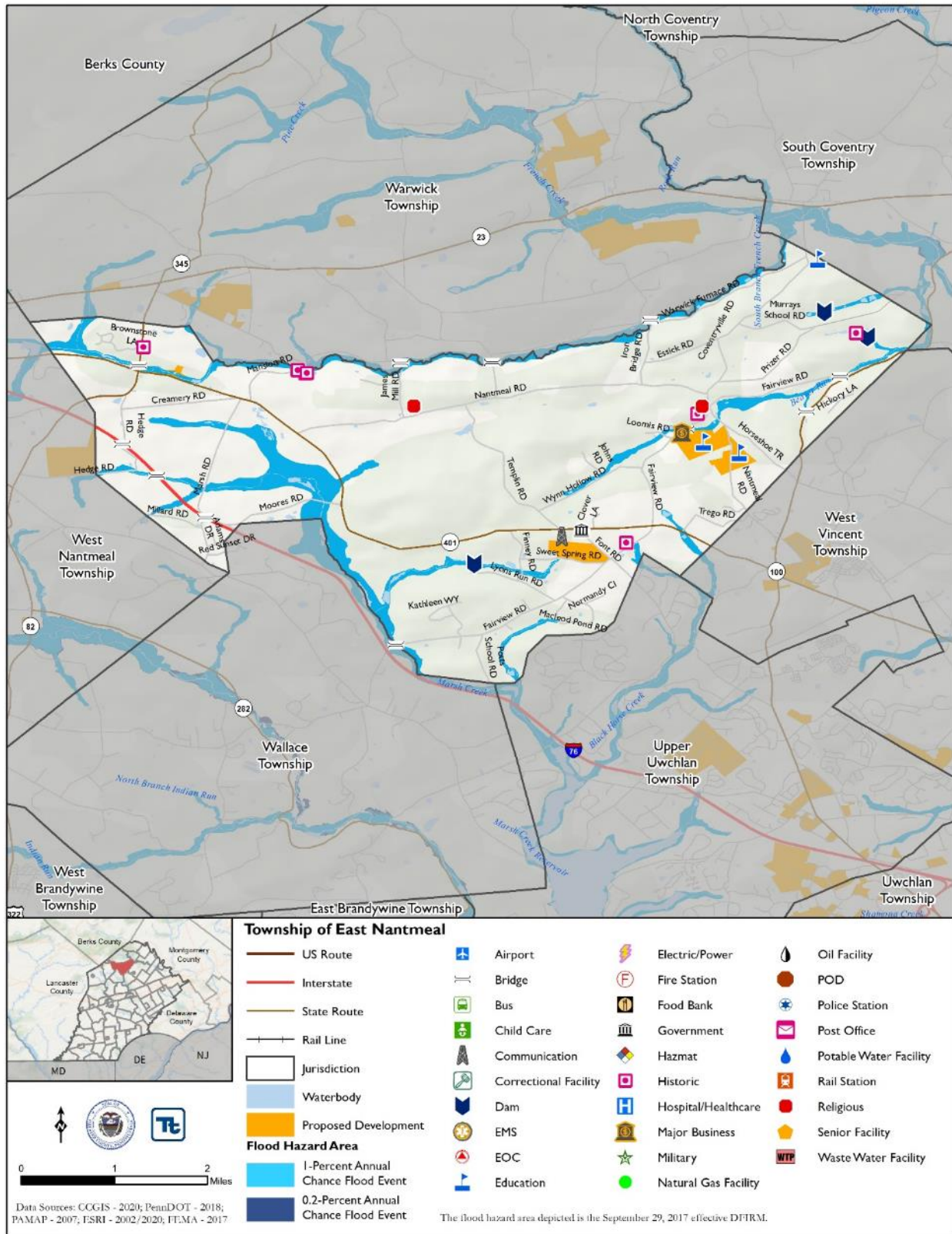


East Marlborough Township



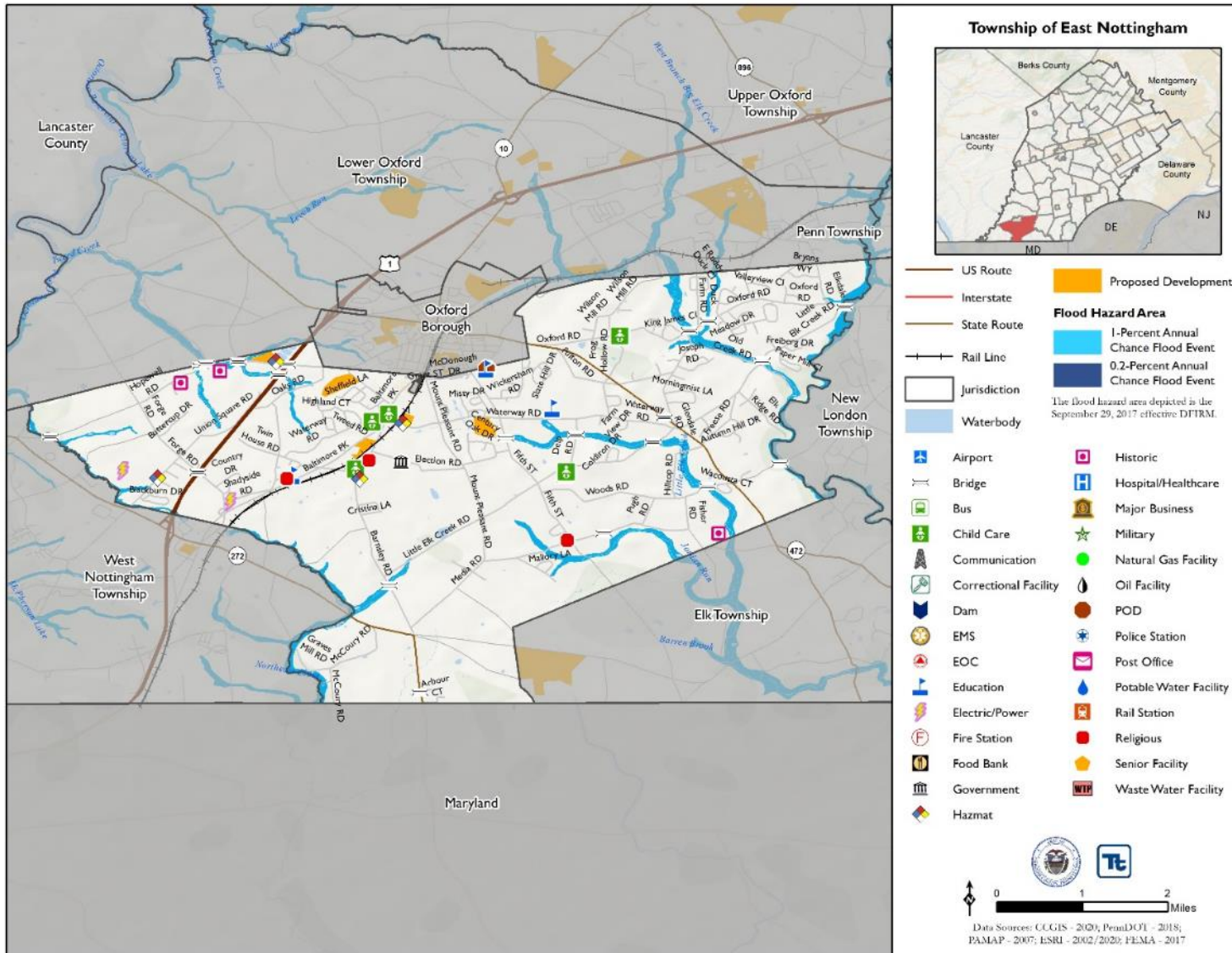


East Nantmeal Township



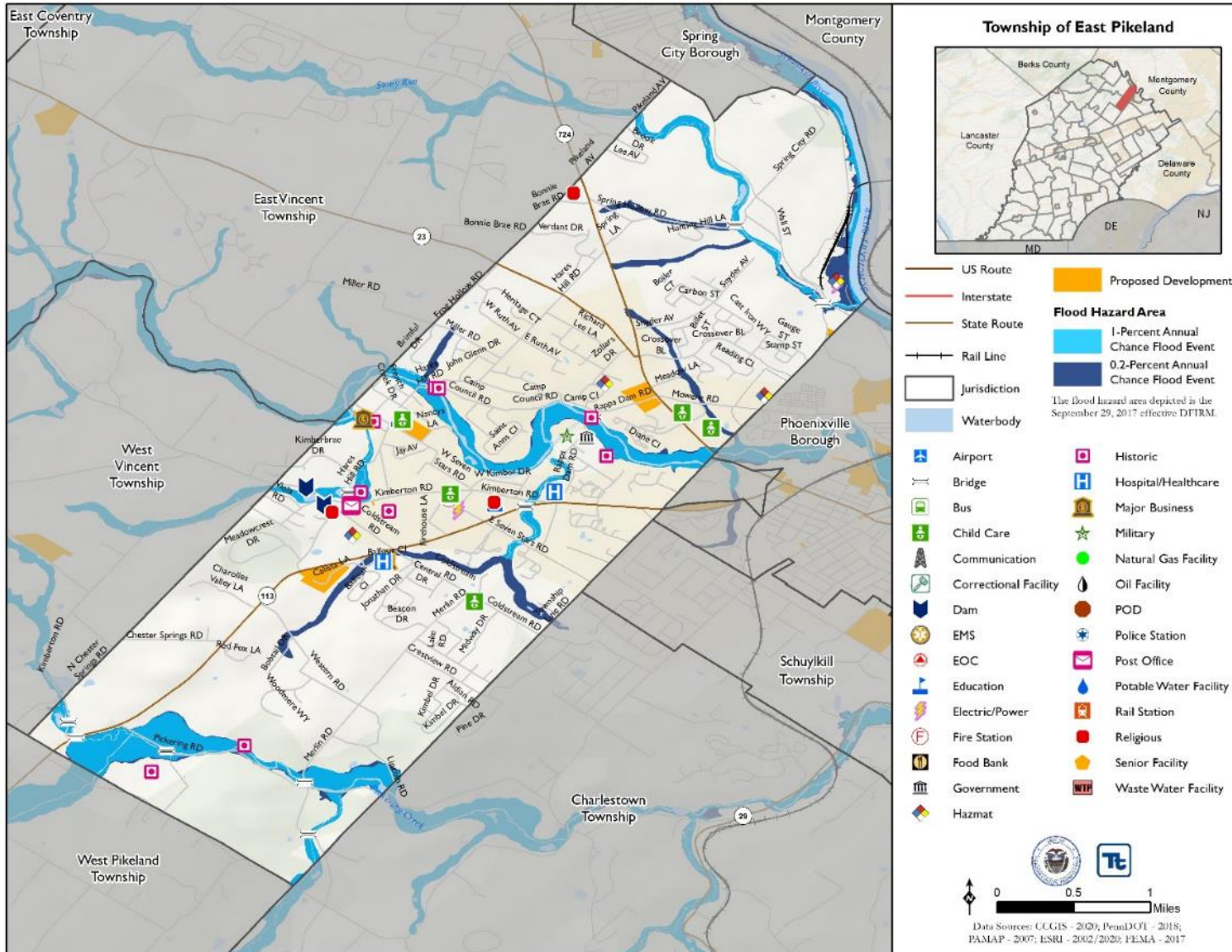


East Nottingham Township



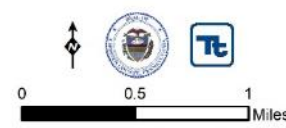
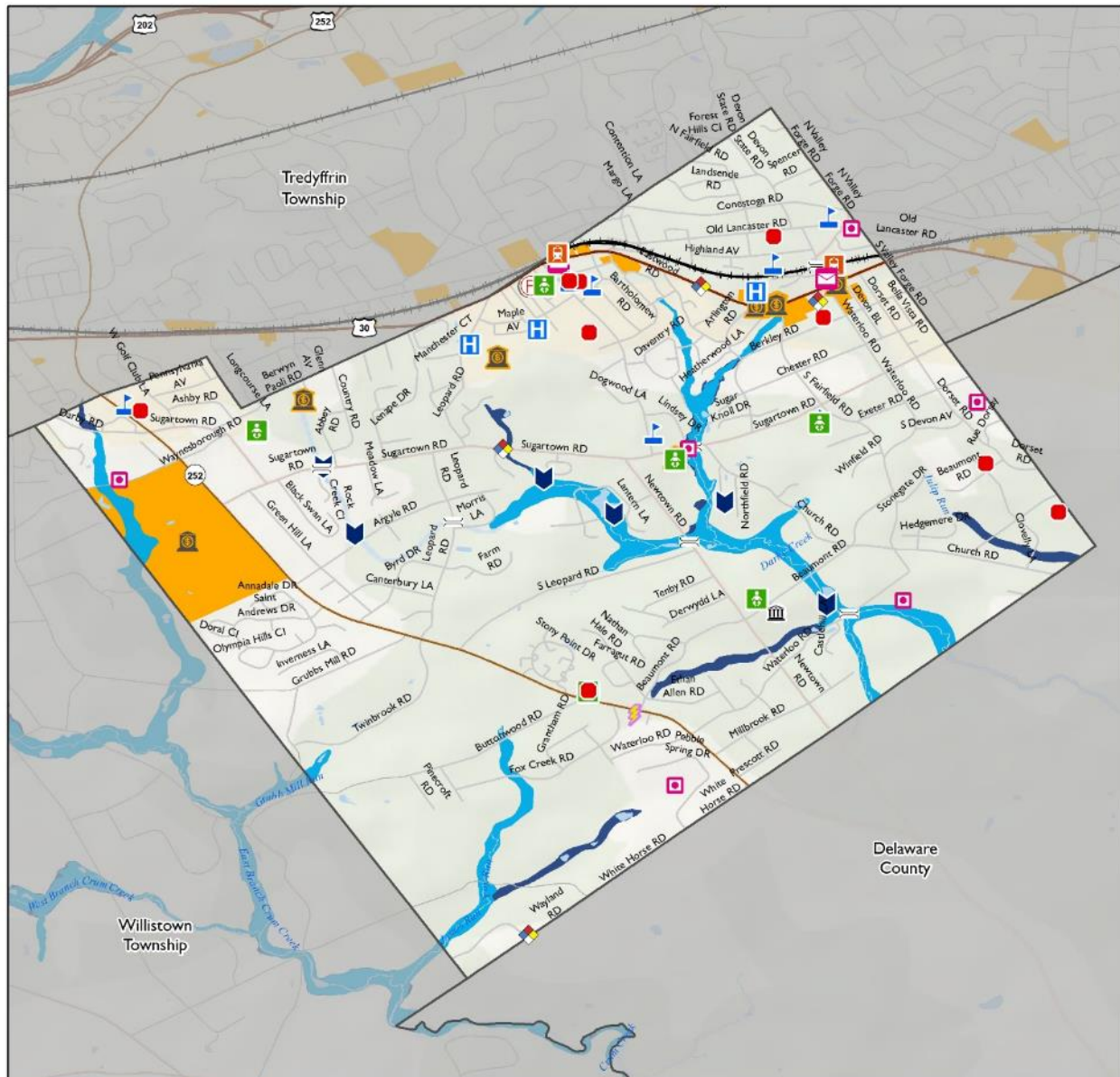


East Pikeland Township





Easttown Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT,MA - 2017

- Township of Easttown**
- US Route
 - Interstate
 - State Route
 - Rail Line
 - Jurisdiction
 - Waterbody
 - Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
 - 0.2-Percent Annual Chance Flood Event

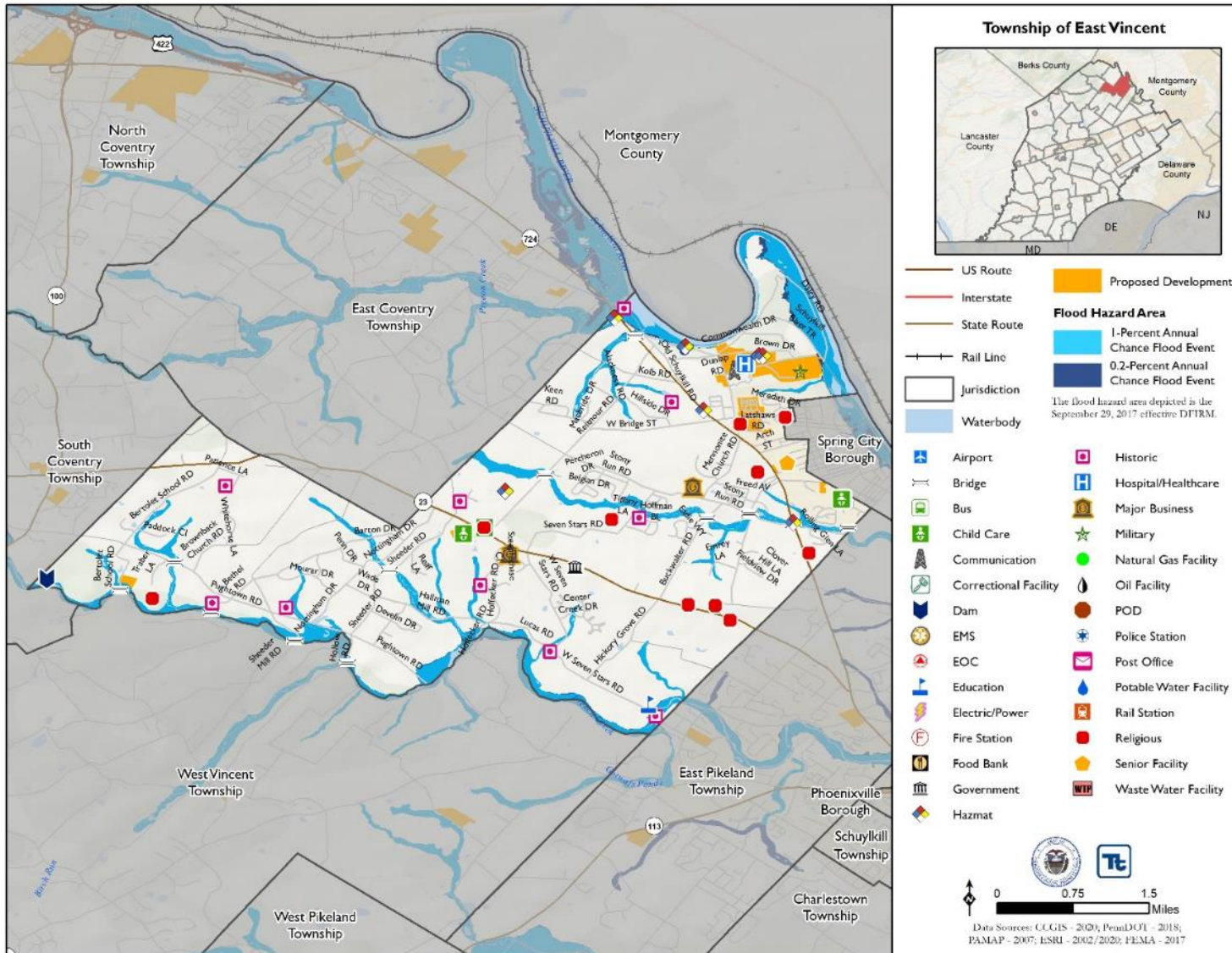
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|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



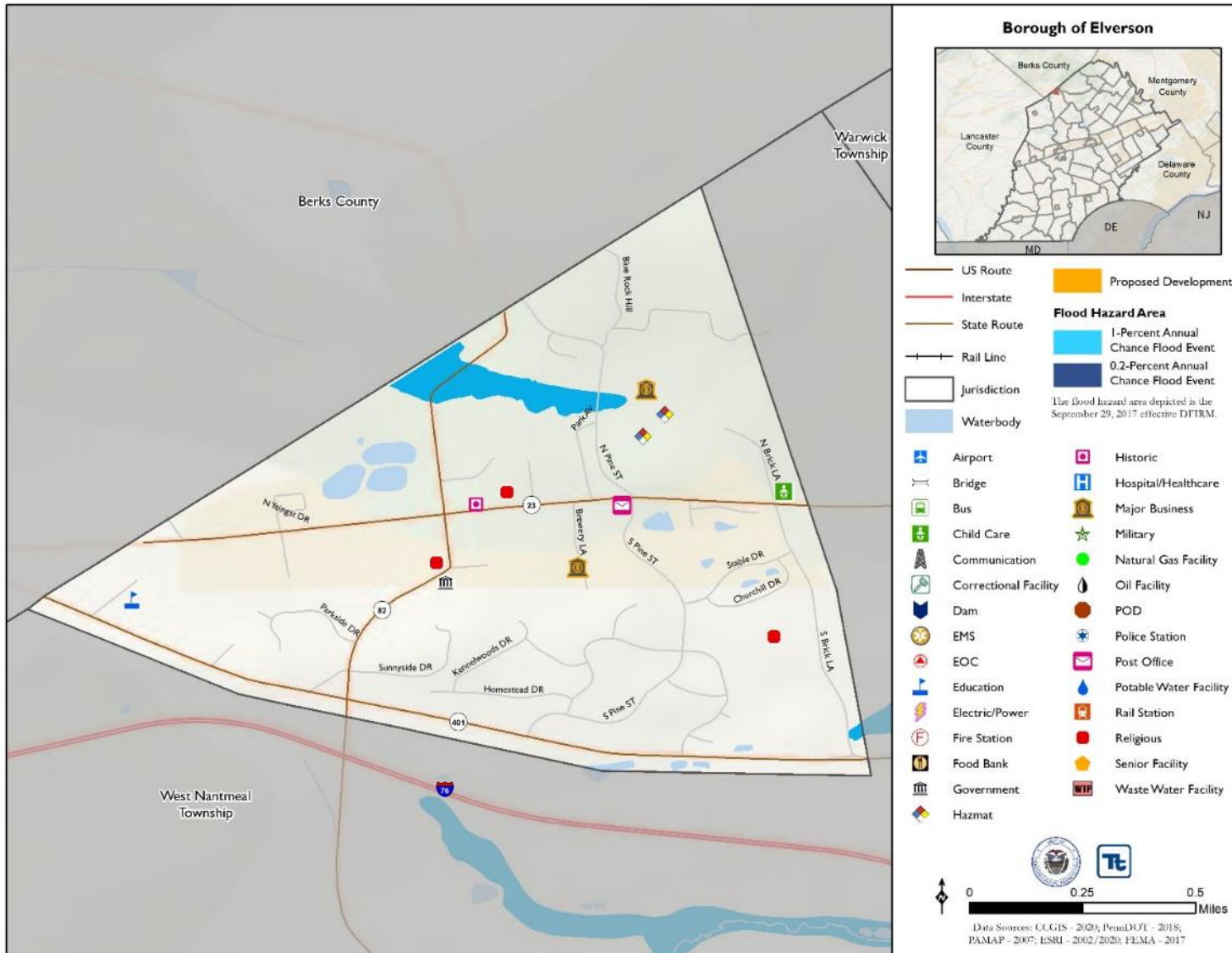


East Vincent Township



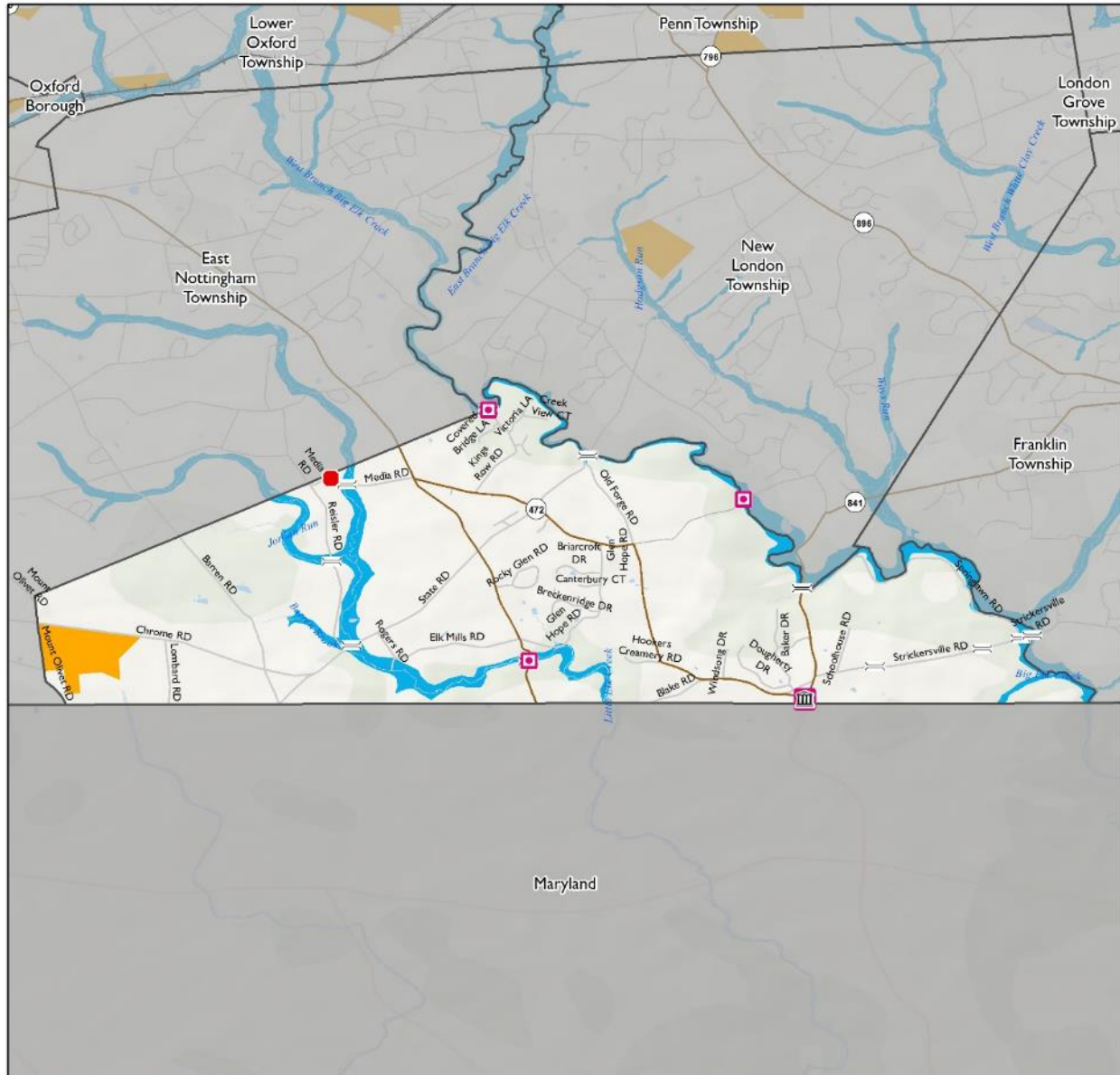


Elverson Borough





Elk Township



MD DE NJ

0 0.75 1.5 Miles

Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

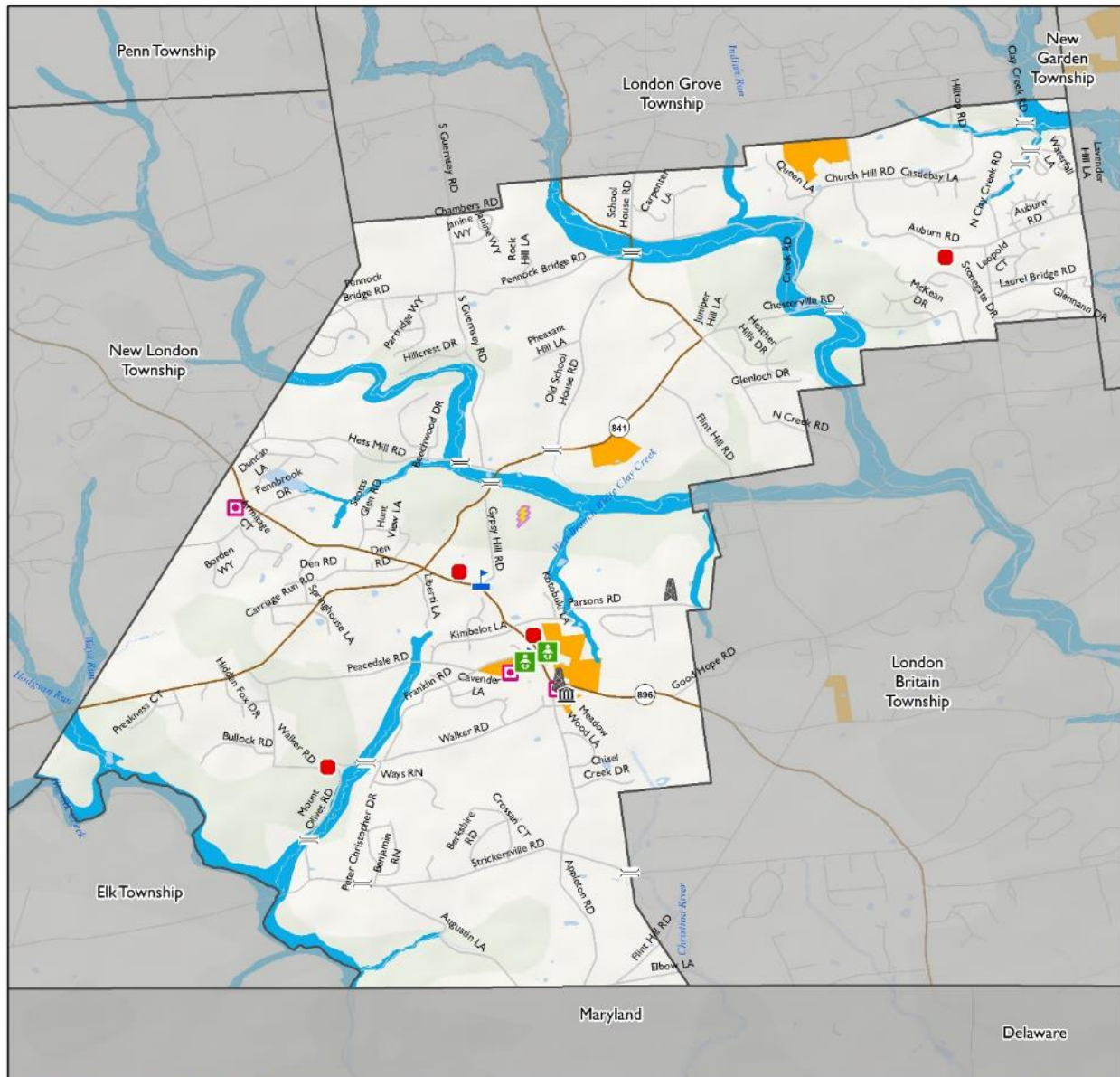
Township of Elk

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
Flood Hazard Area	EMS	Major Business	Senior Facility
1-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
0.2-Percent Annual Chance Flood Event	Education	Natural Gas Facility	

The flood hazard area depicted is the September 29, 2017 effective DFTRM.



Franklin Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FEMA - 2017

Township of Franklin

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

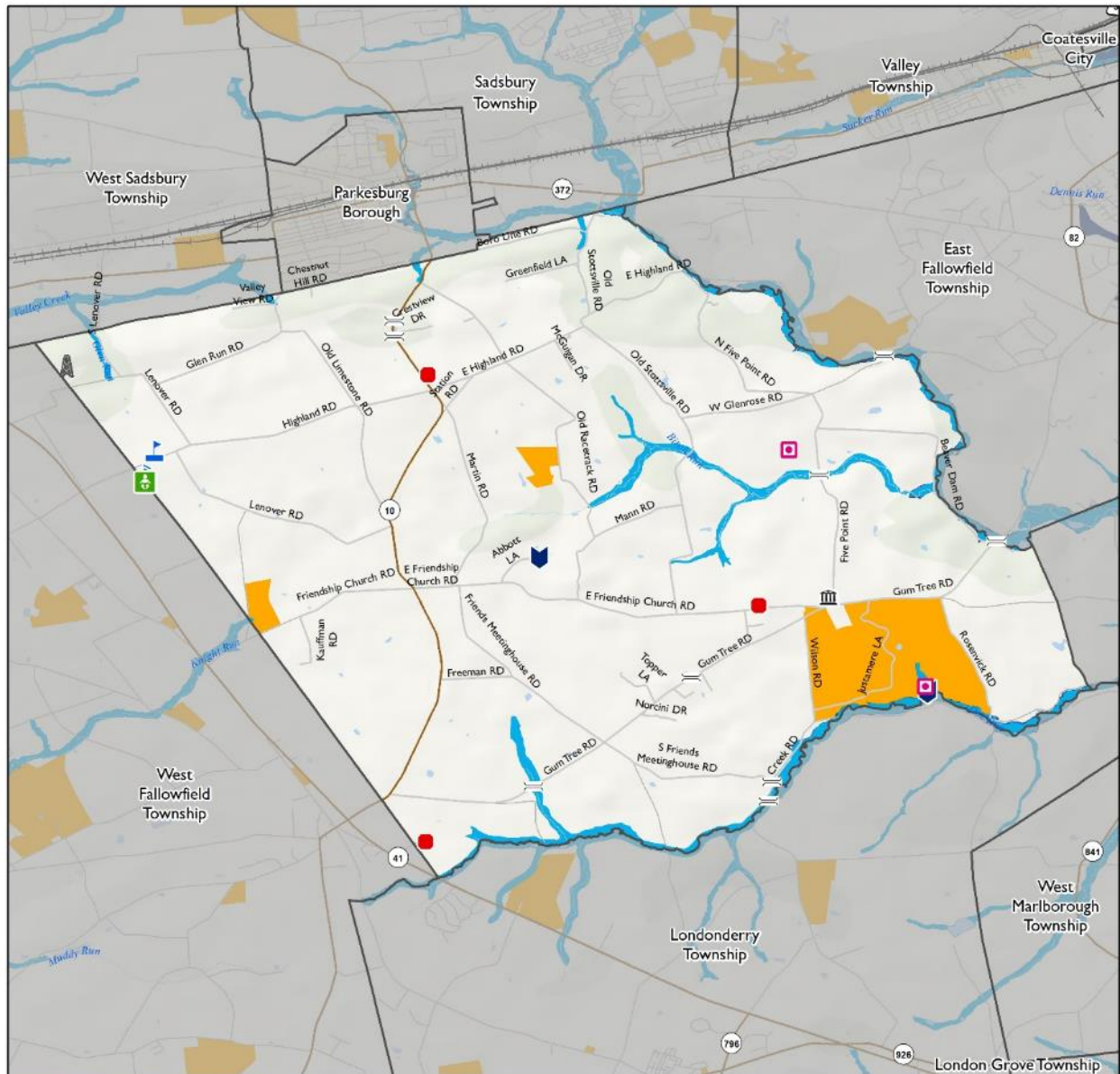
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Hospital/Healthcare | Rail Station |
| Dam | Major Business | Religious |
| EMS | Military | Senior Facility |
| EOC | Natural Gas Facility | Waste Water Facility |
| Education | | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.





Highland Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of Highland

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

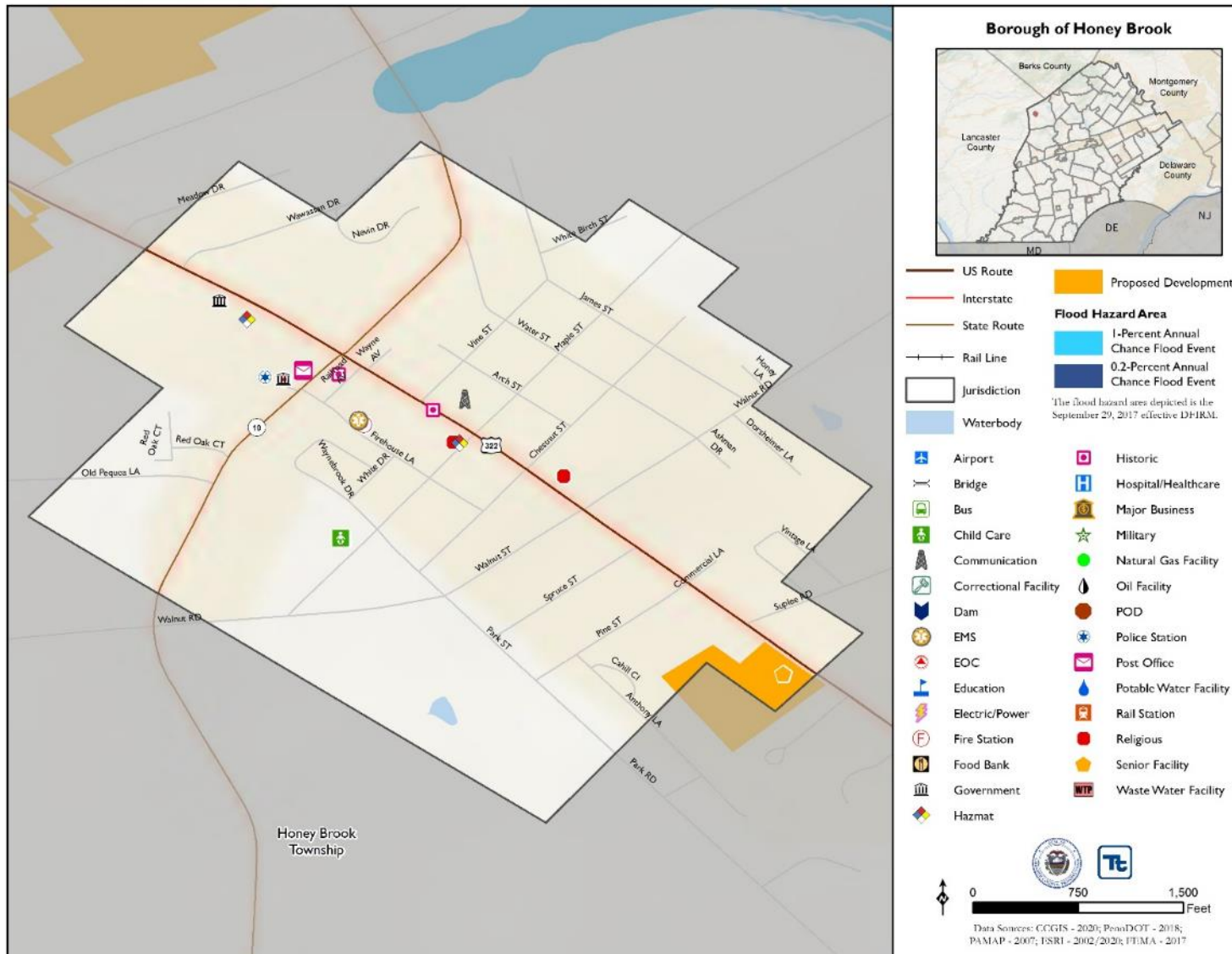
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



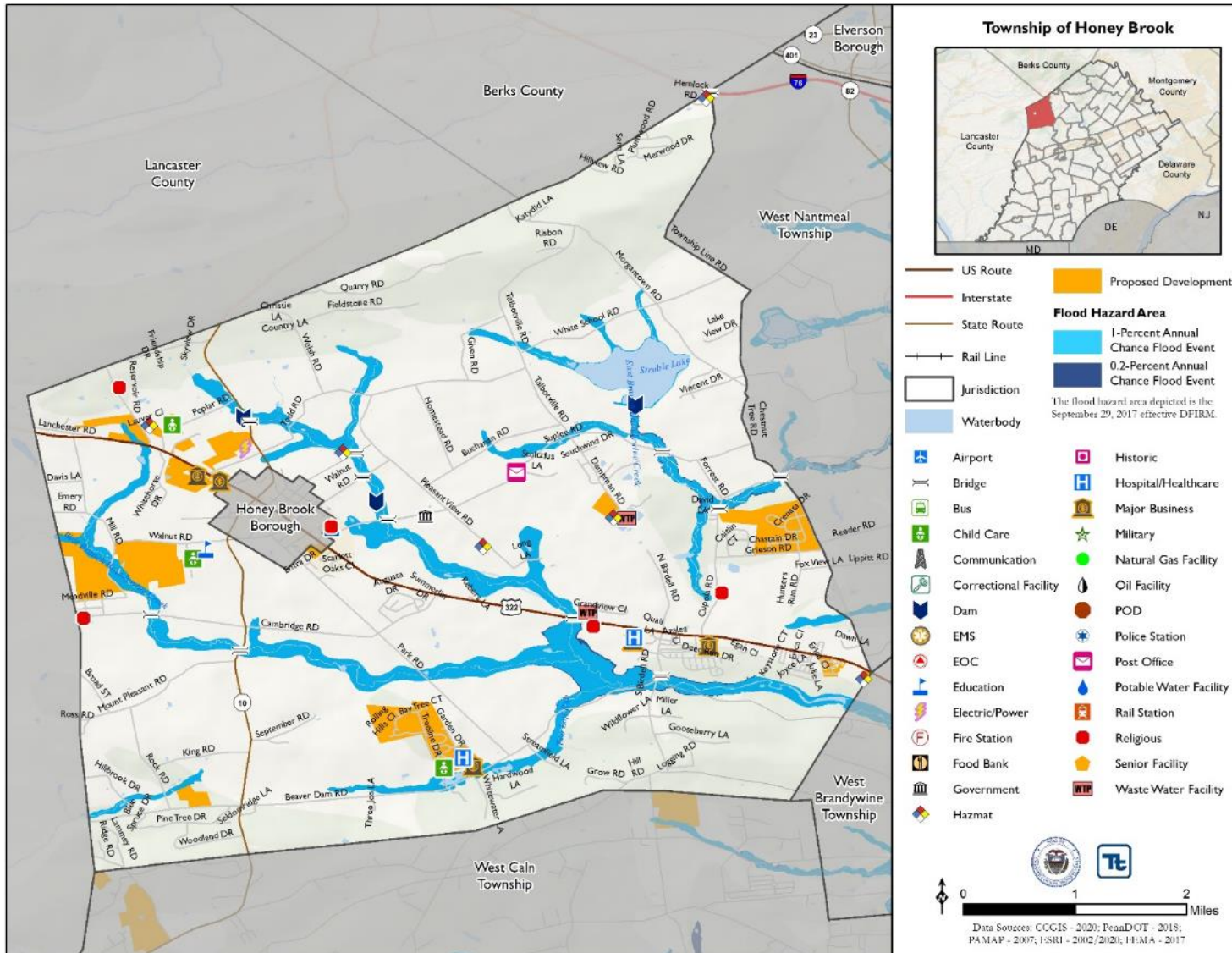


Honey Brook Borough



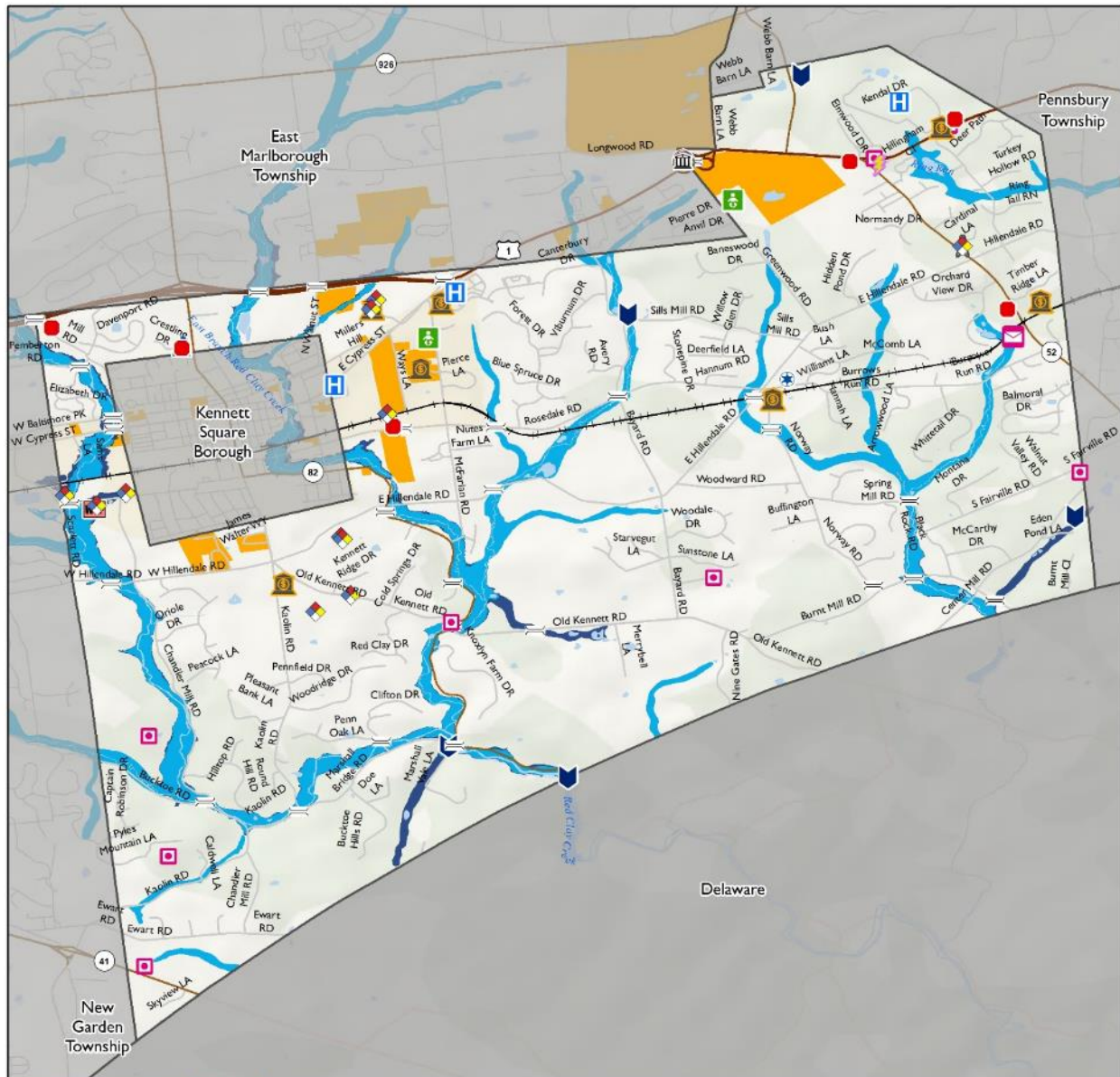


Honey Brook Township





Kennett Township



MD DE NJ

Township of Kennett

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
Flood Hazard Area	EMS	Major Business	Senior Facility
1-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
0.2-Percent Annual Chance Flood Event	Education	Natural Gas Facility	

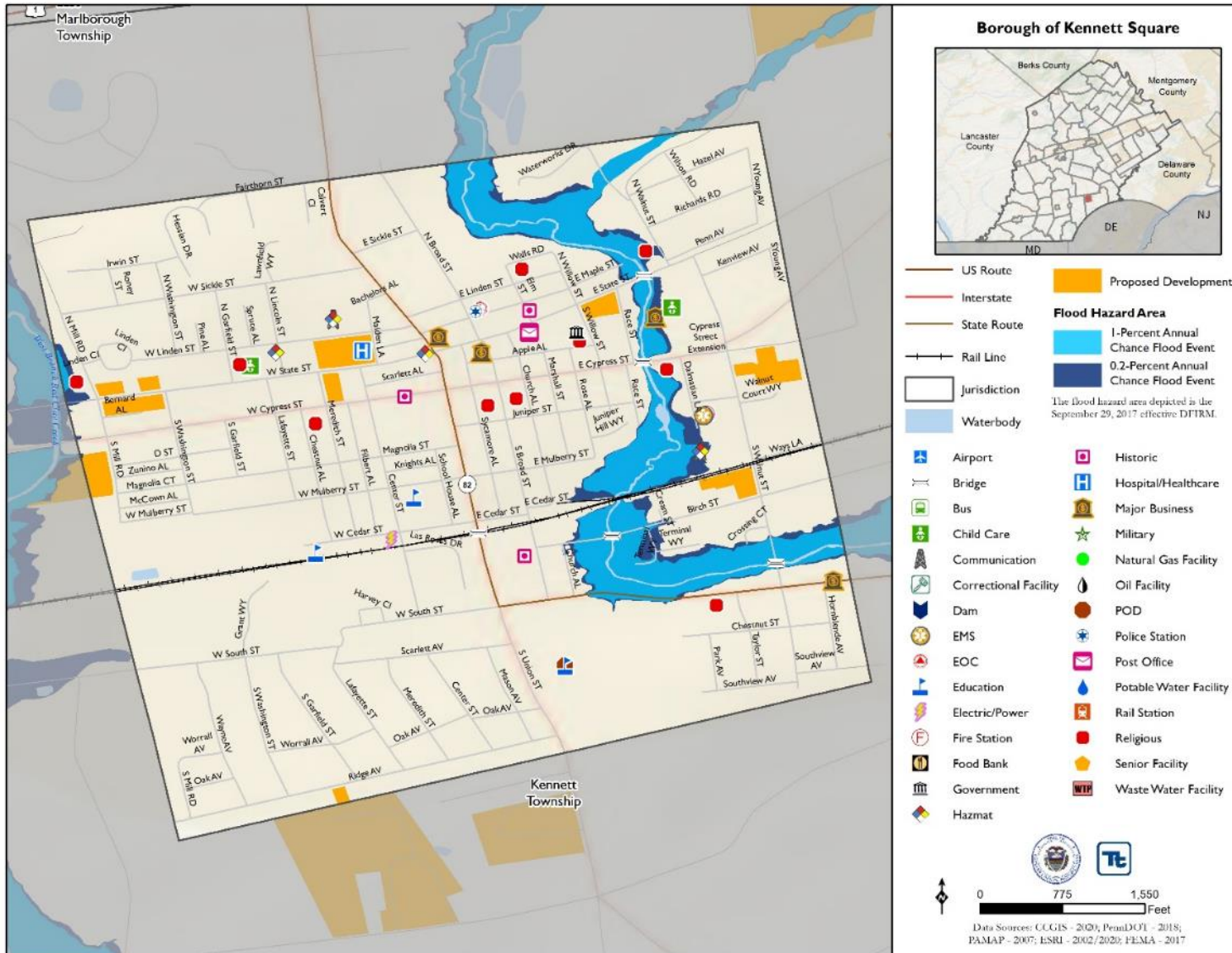
Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



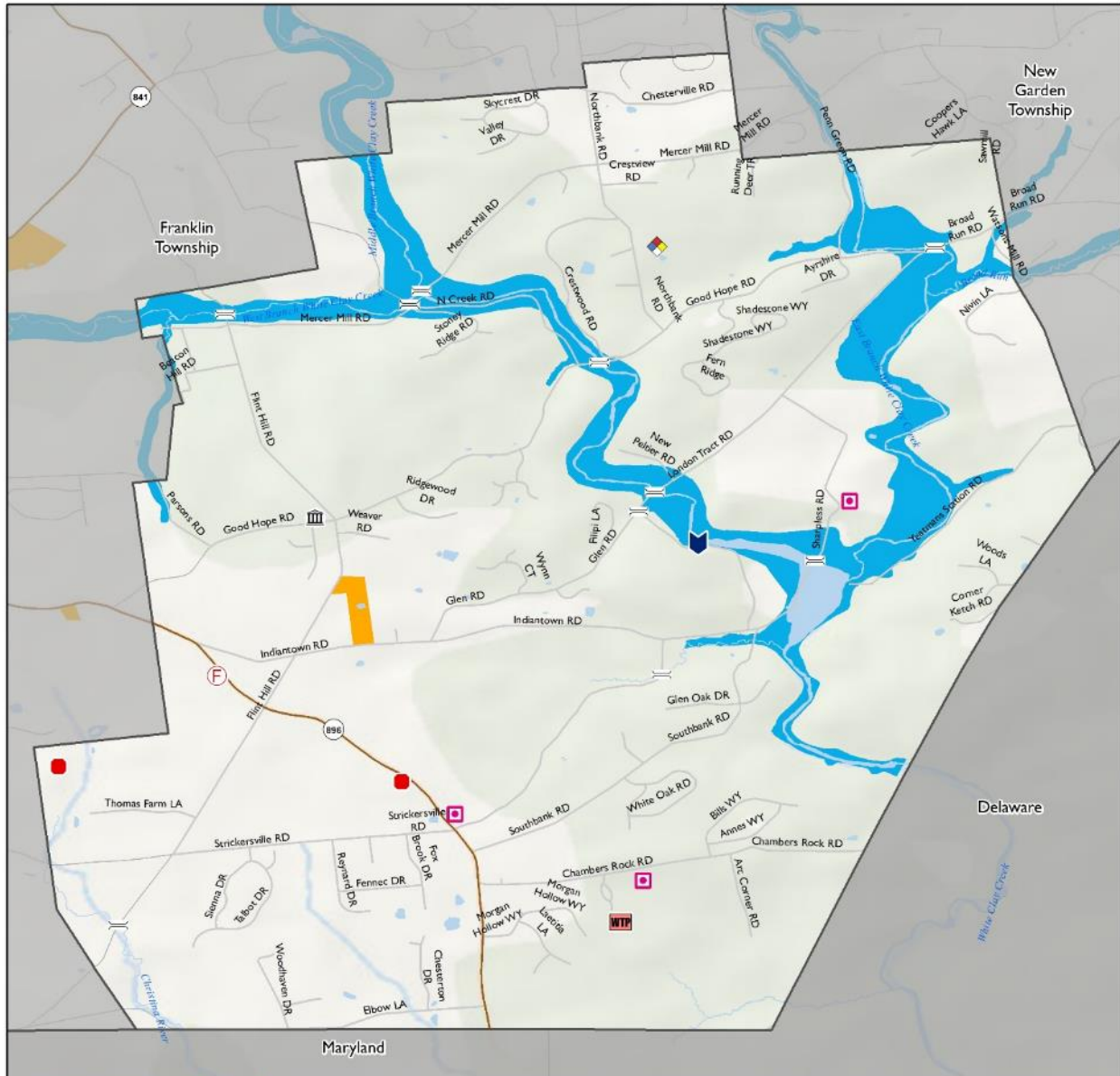


Kennett Square Borough





London Britain Township



MD DE NJ

Township of London Britain

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
1-Percent Annual Chance Flood Event	EMS	Major Business	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
	Education	Natural Gas Facility	

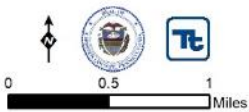
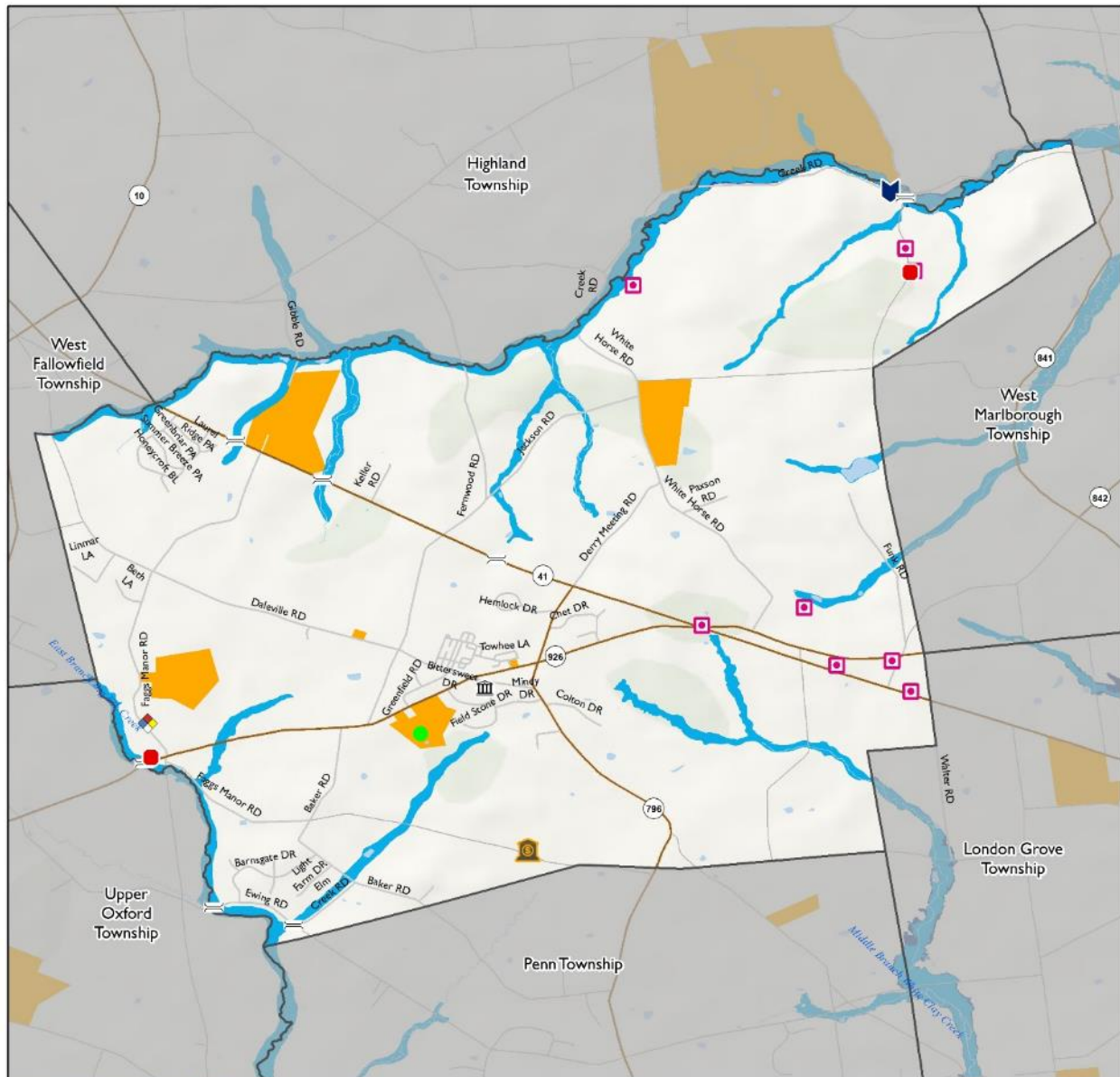
0 0.25 0.5 Miles

Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFTRM.



Londonderry Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

Township of Londonderry

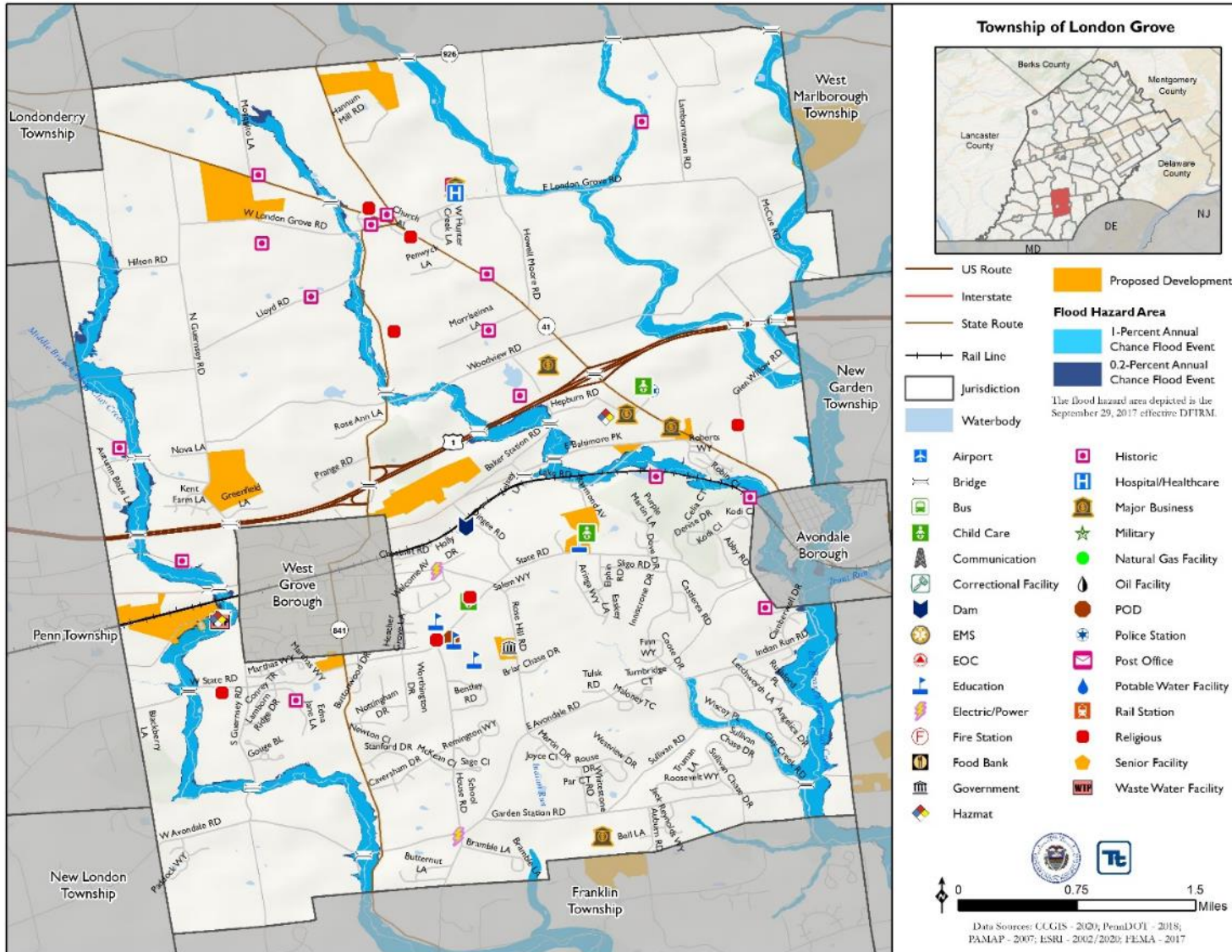
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Hospital/Healthcare | Rail Station |
| Dam | Major Business | Religious |
| EMS | Military | Senior Facility |
| EOC | Natural Gas Facility | Waste Water Facility |
| Education | | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

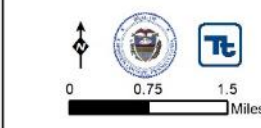
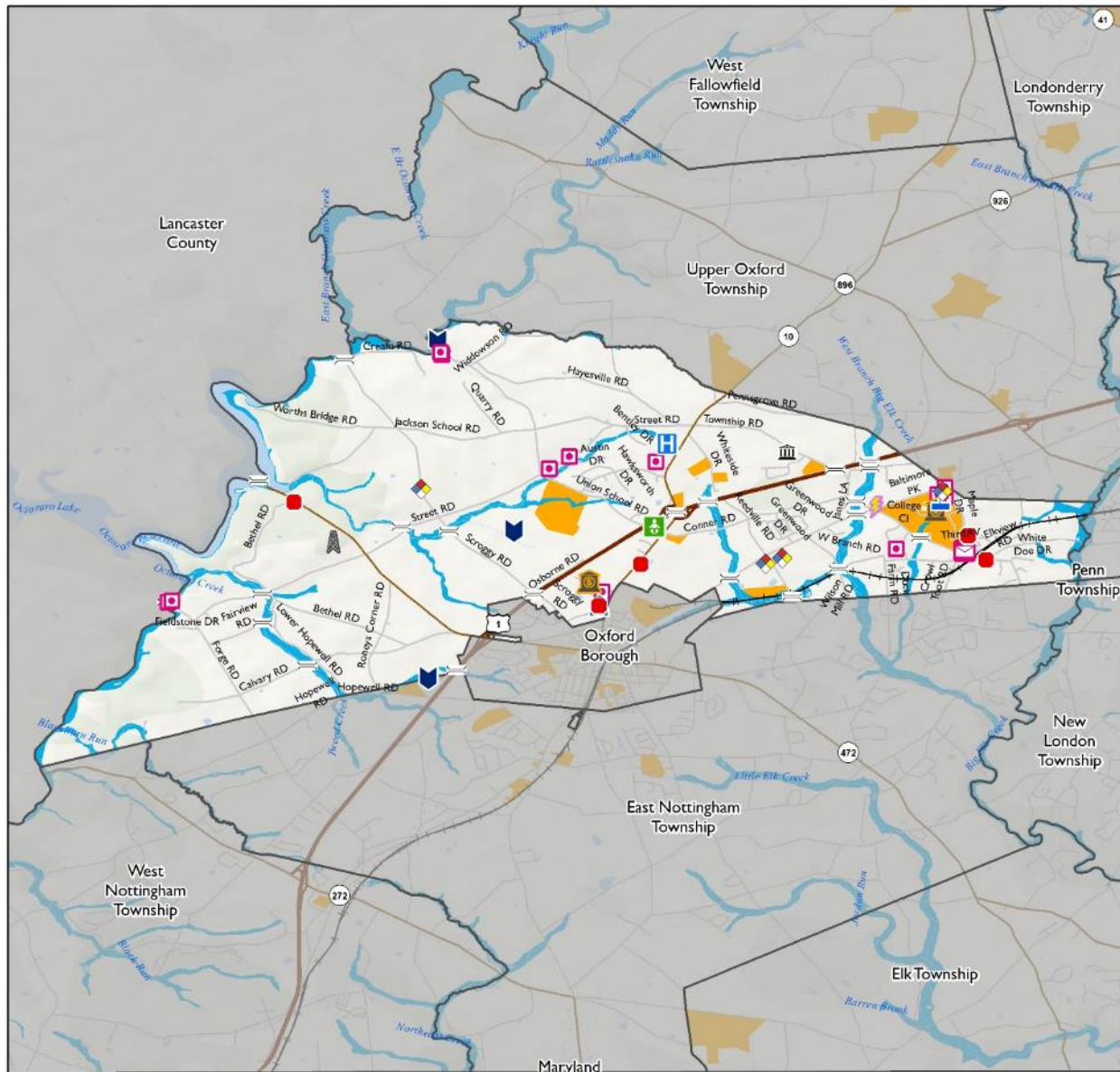


London Grove Township





Lower Oxford Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

Township of Lower Oxford

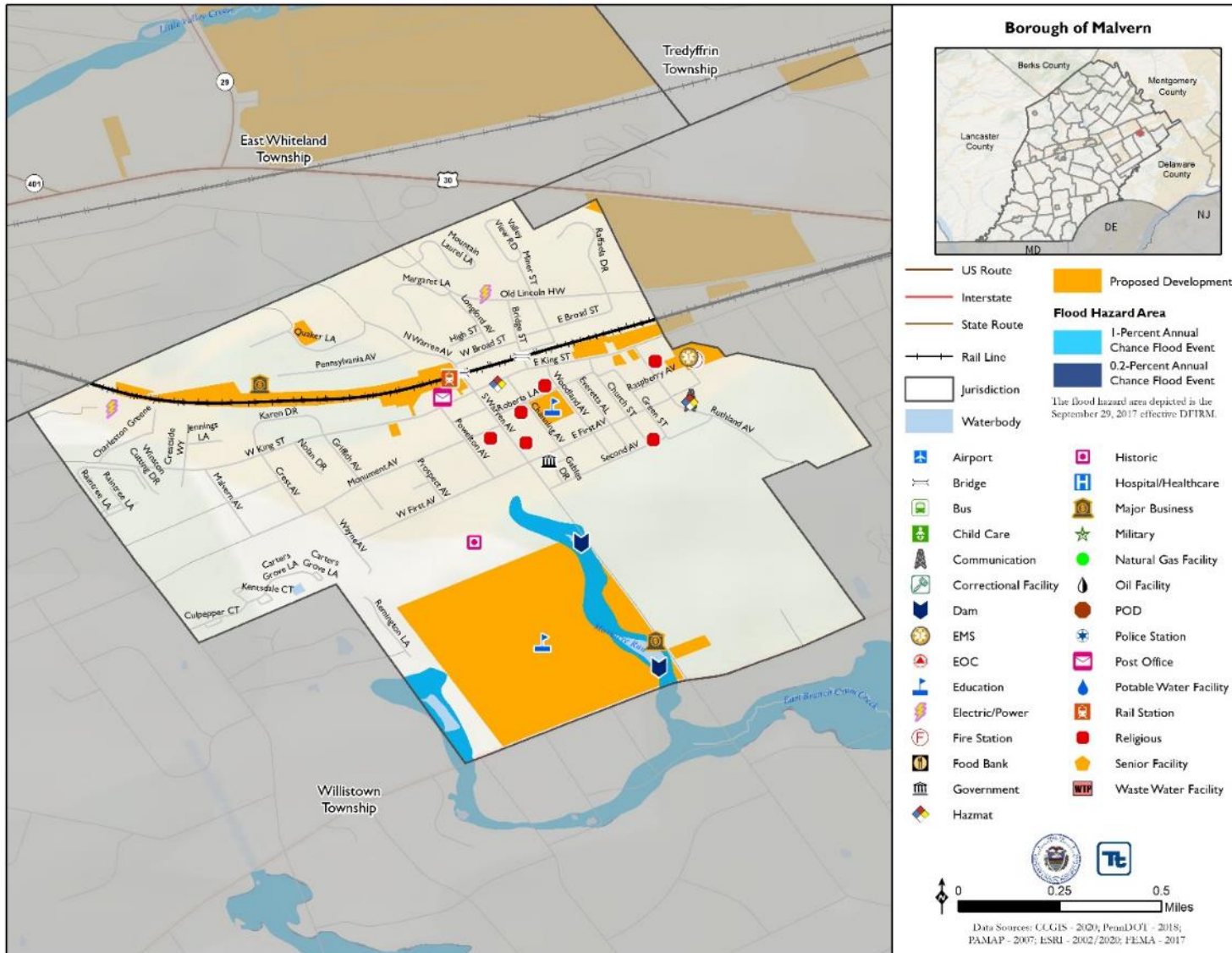
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

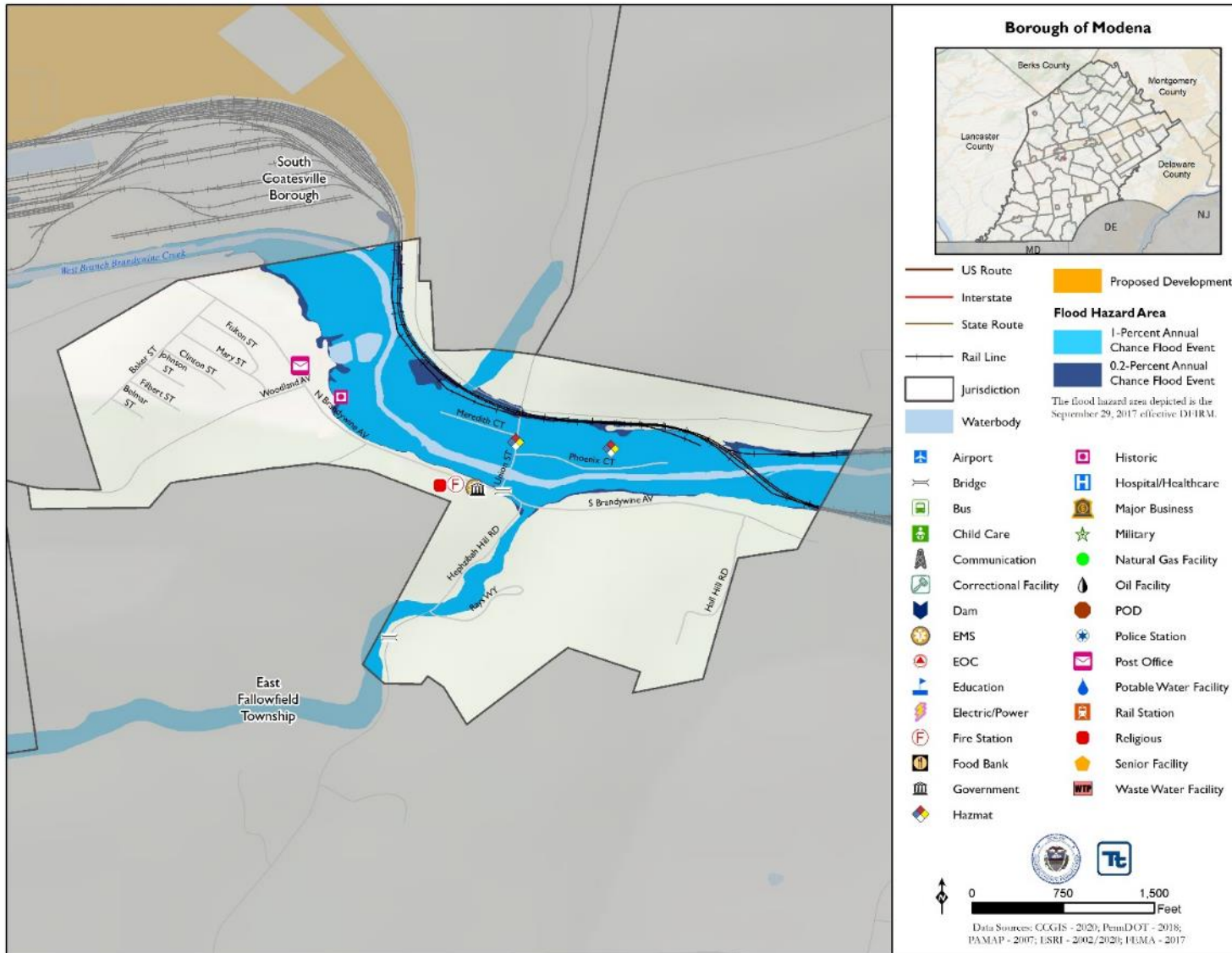


Malvern Borough



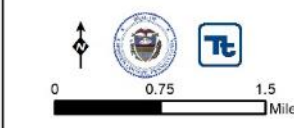
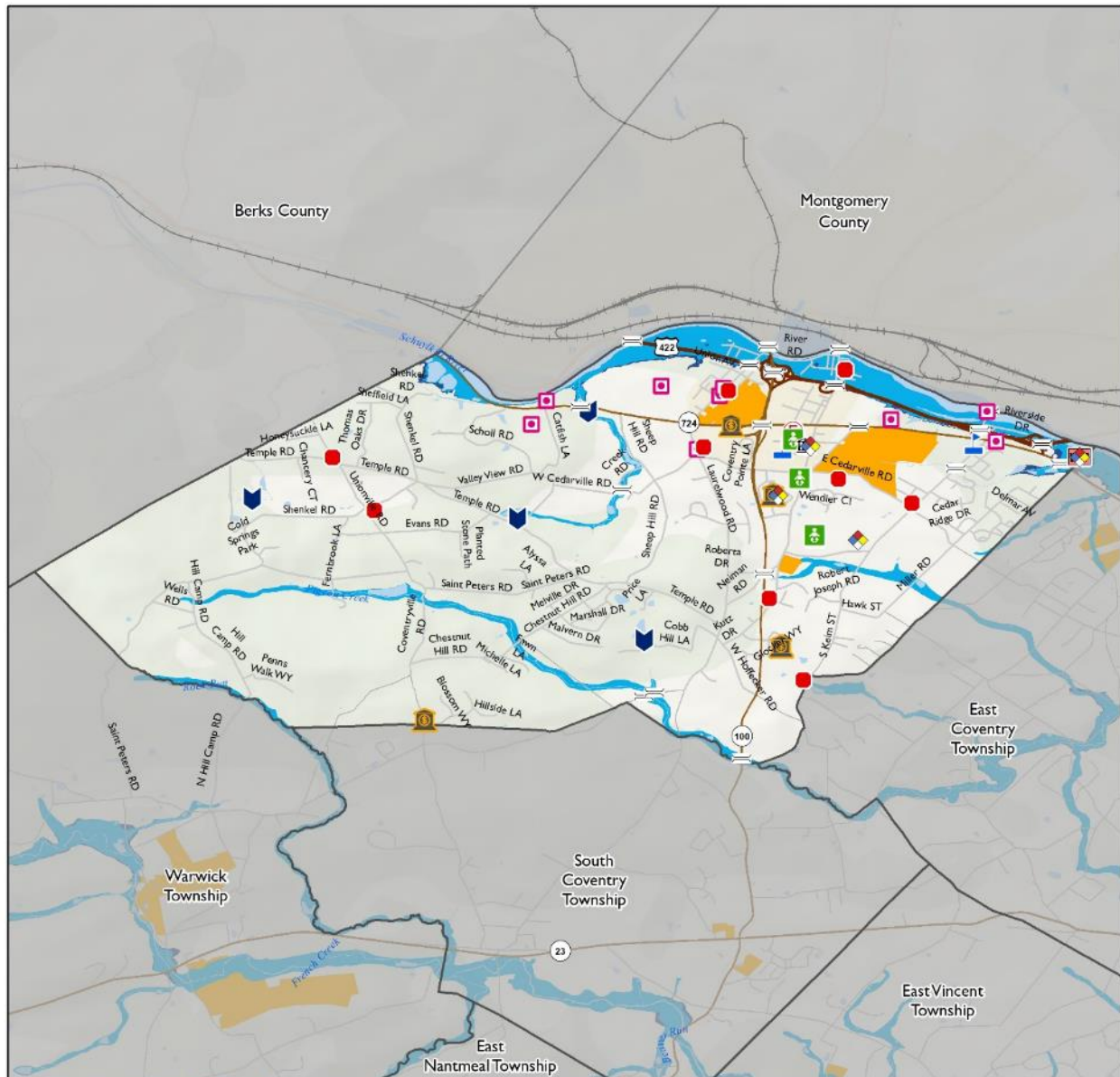


Modena Borough





North Coventry Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

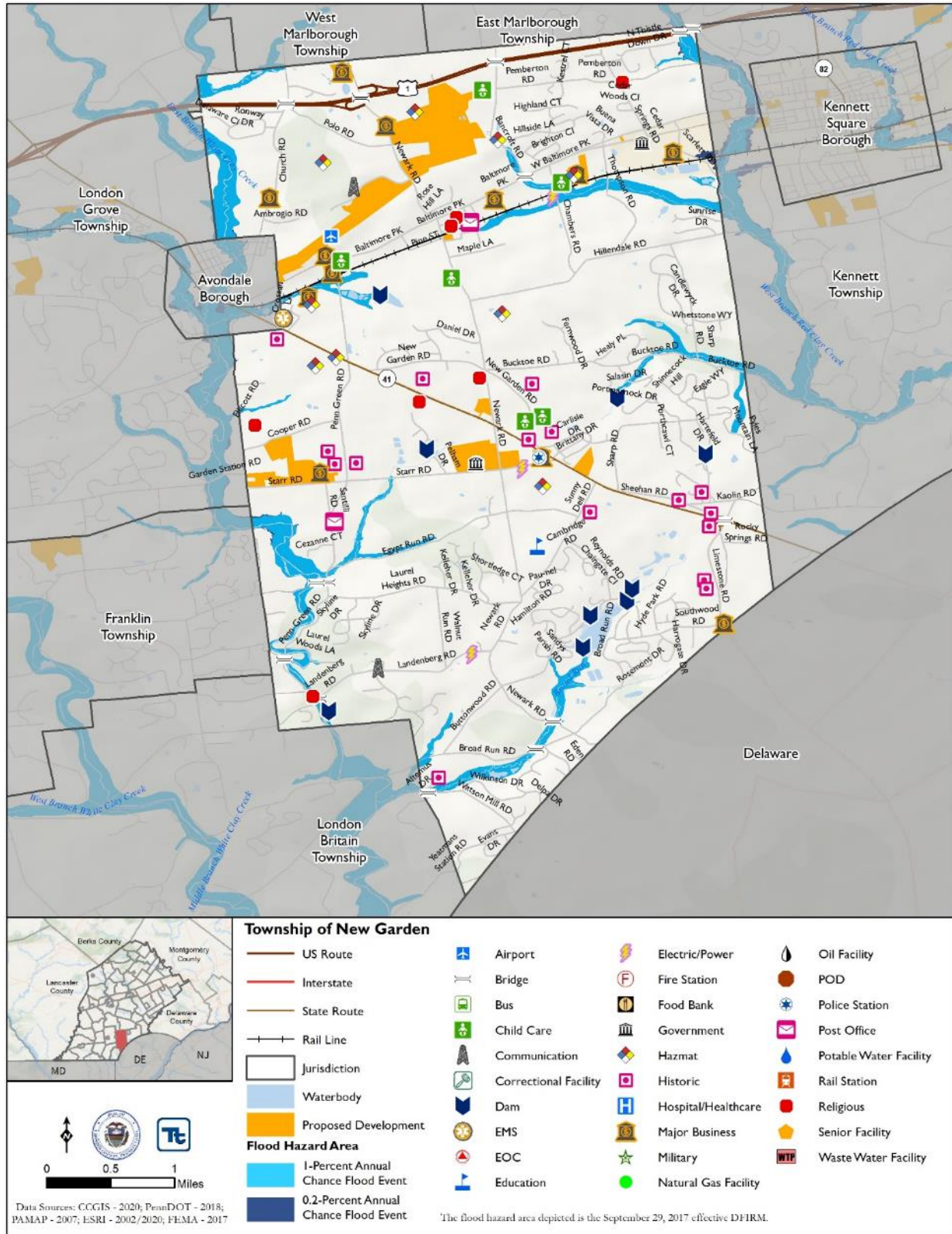
Township of North Coventry

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
1-Percent Annual Chance Flood Event	EMS	Military	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
	Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

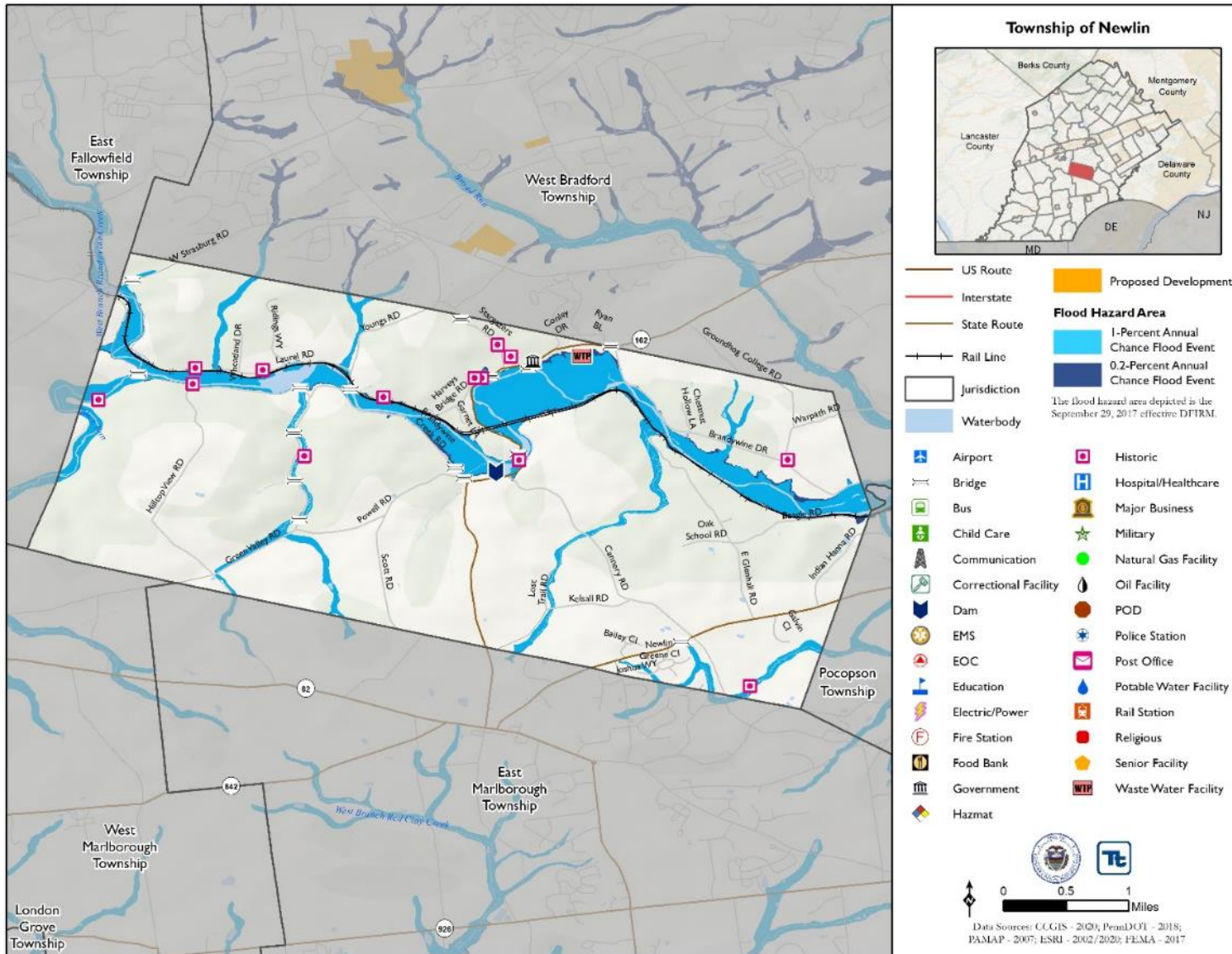


New Garden Township



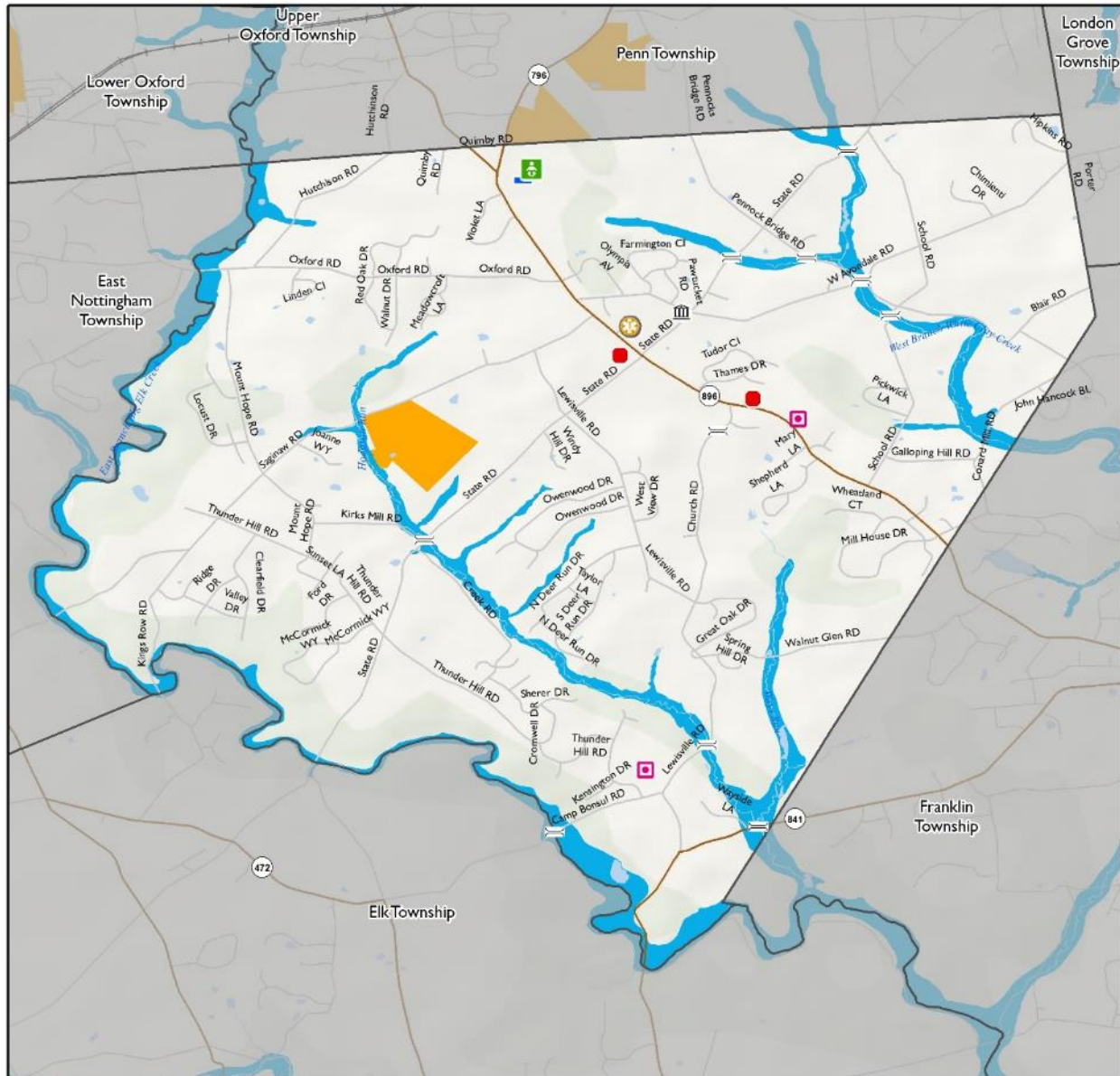


Newlin Township





New London Township



Berks County, Montgomery County, Lancaster County, Delaware County, MD, DE, NJ

Township of New London

— US Route	Airport	Electric/Power	Oil Facility
— Interstate	Bridge	Fire Station	POD
— State Route	Bus	Food Bank	Police Station
— Rail Line	Child Care	Government	Post Office
□ Jurisdiction	Communication	Hazmat	Potable Water Facility
■ Waterbody	Correctional Facility	Historic	Rail Station
■ Proposed Development	Dam	Hospital/Healthcare	Religious
■ Flood Hazard Area	EMS	Major Business	Senior Facility
■ 1-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
■ 0.2-Percent Annual Chance Flood Event	Education	Natural Gas Facility	

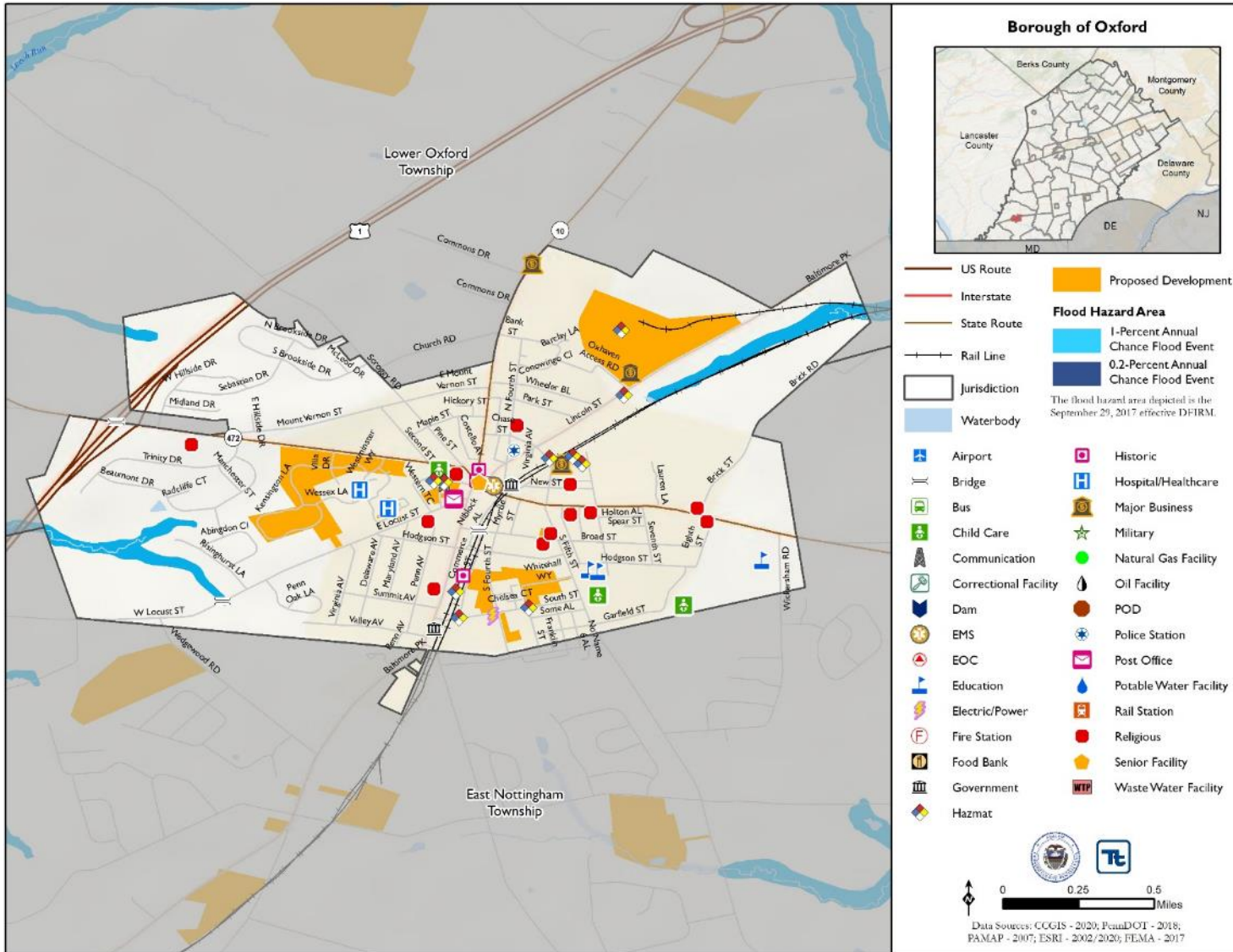
0 0.5 1 Miles

Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; ESRI - 2002/2020; FEMA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

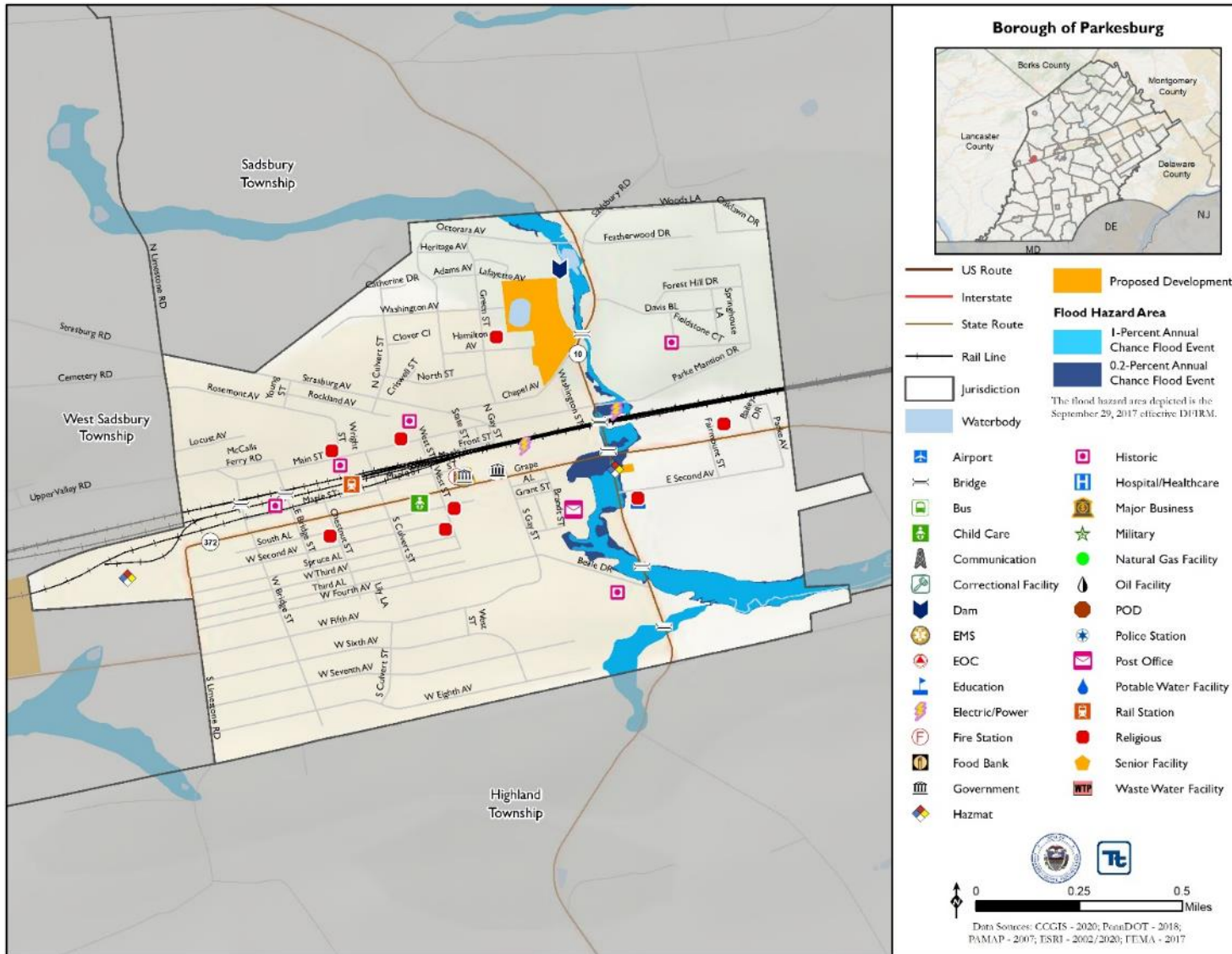


Oxford Borough



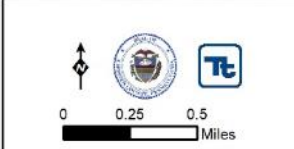
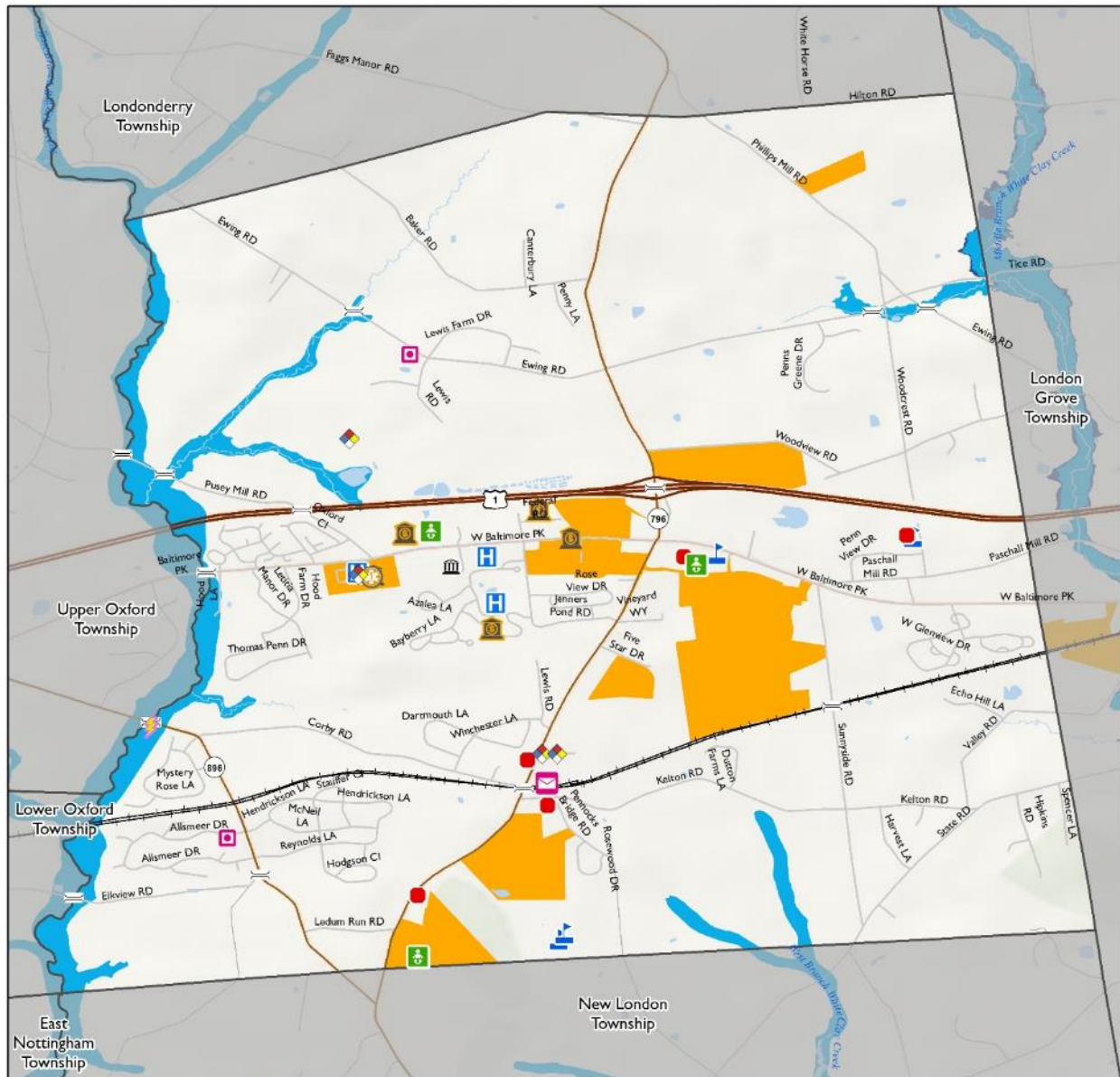


Parkesburg Borough





Penn Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

- Township of Penn**
- US Route
 - Interstate
 - State Route
 - Rail Line
 - Jurisdiction
 - Waterbody
 - Proposed Development
 - 1-Percent Annual Chance Flood Event
 - 0.2-Percent Annual Chance Flood Event

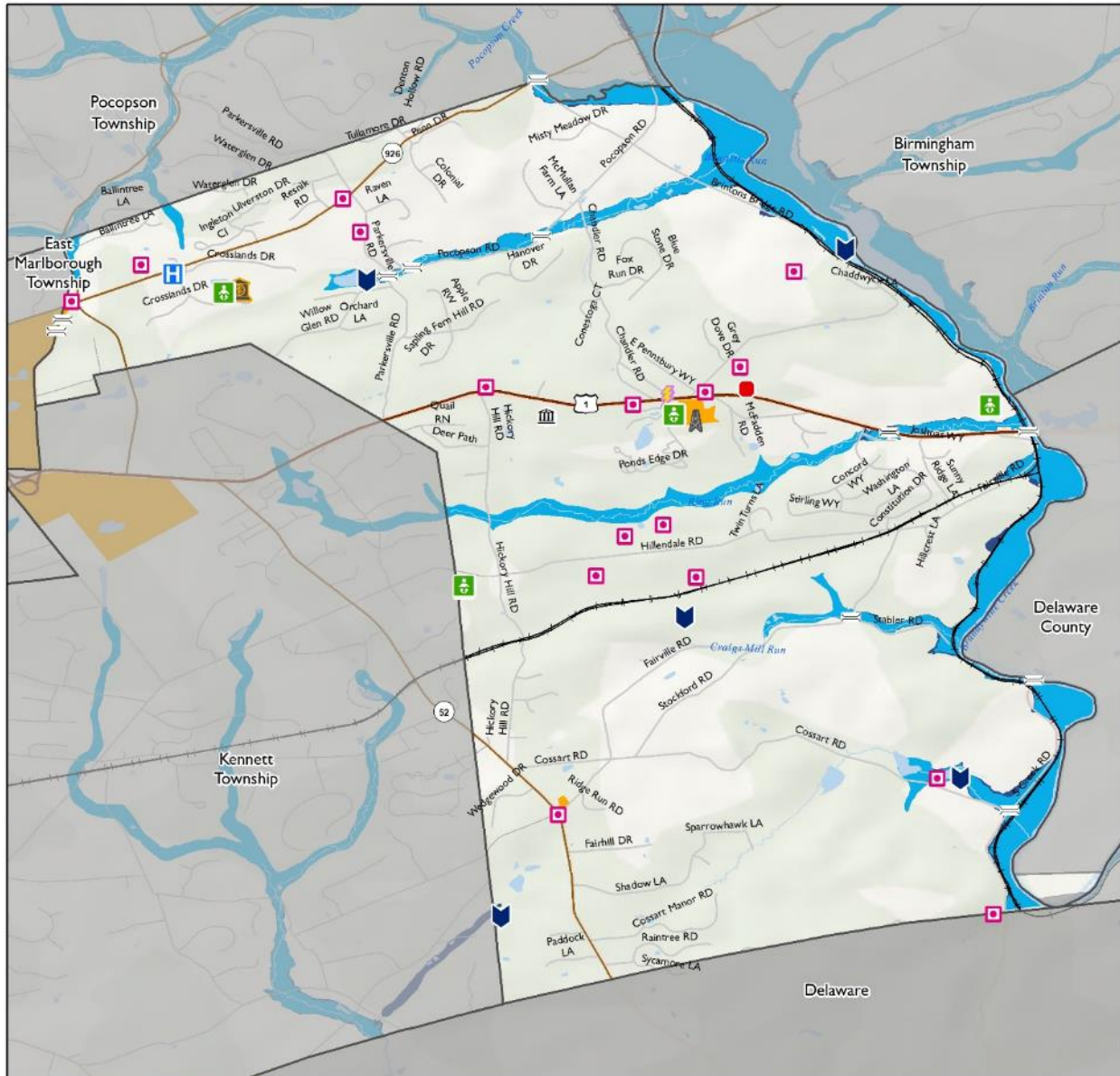
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.





Pennsbury Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of Pennsbury

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

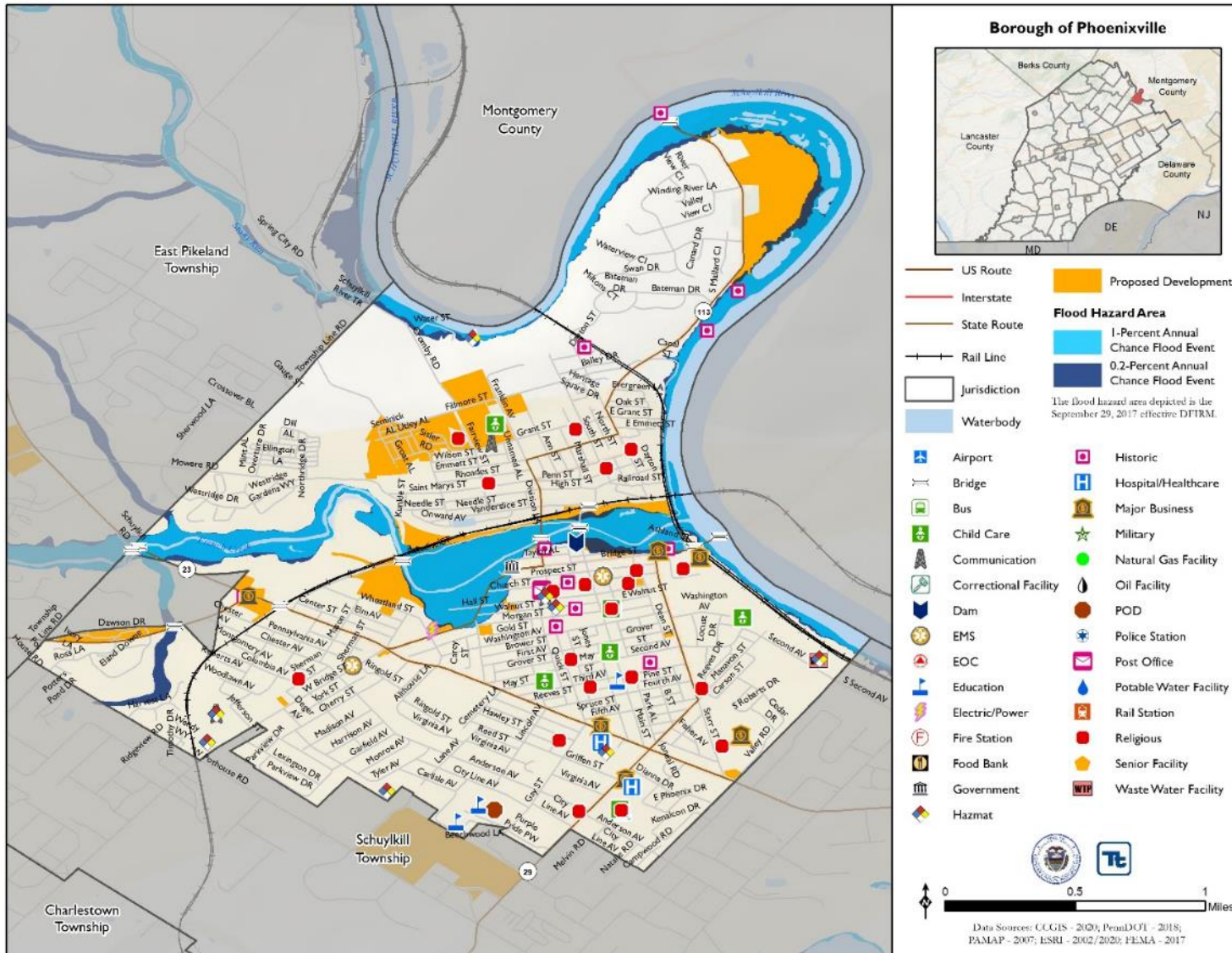
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFTRM.



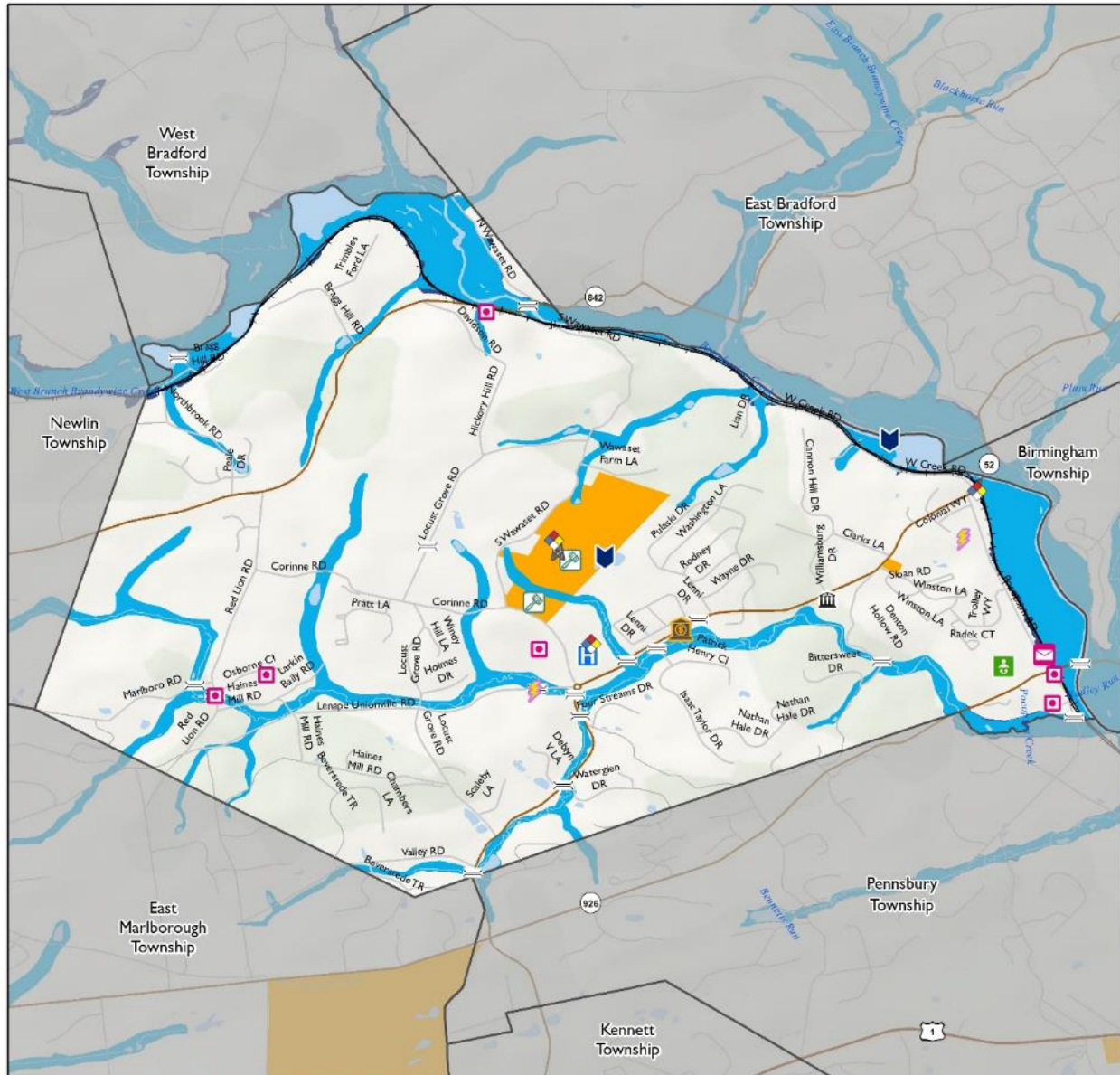


Phoenixville Borough





Pocopson Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

Township of Pocopson

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development

Flood Hazard Area

- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

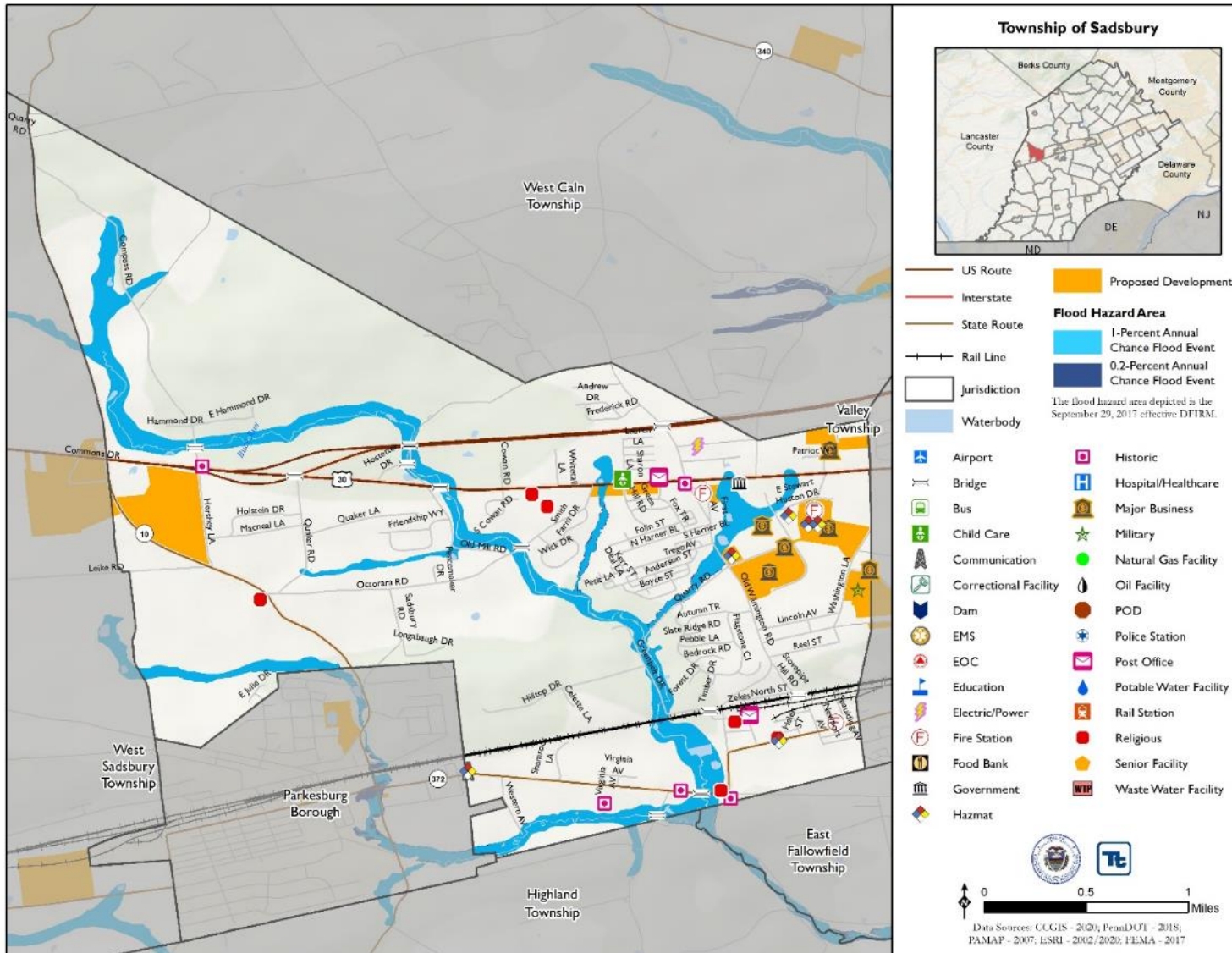
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



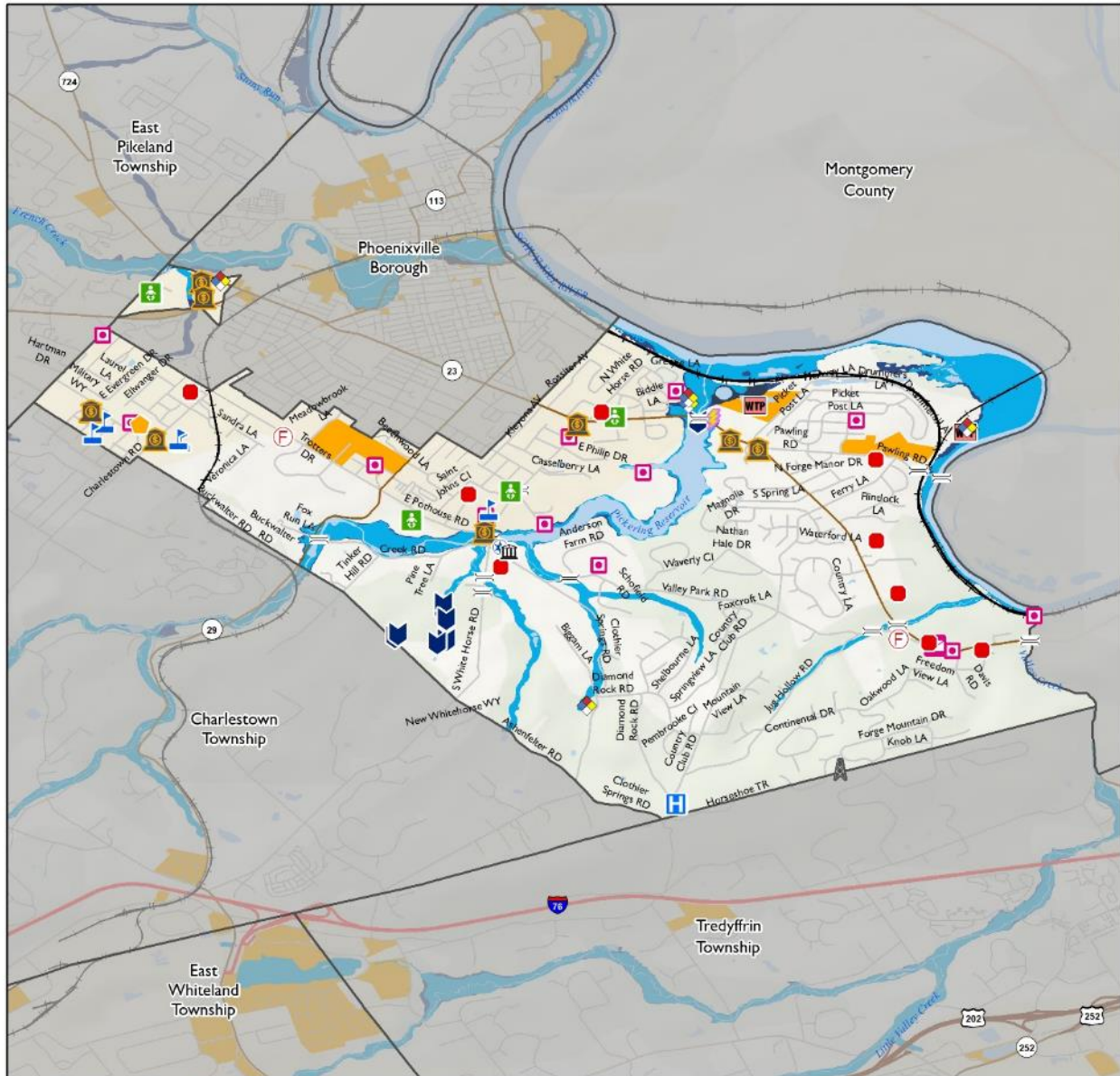


Sadsbury Township





Schuylkill Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of Schuylkill

- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

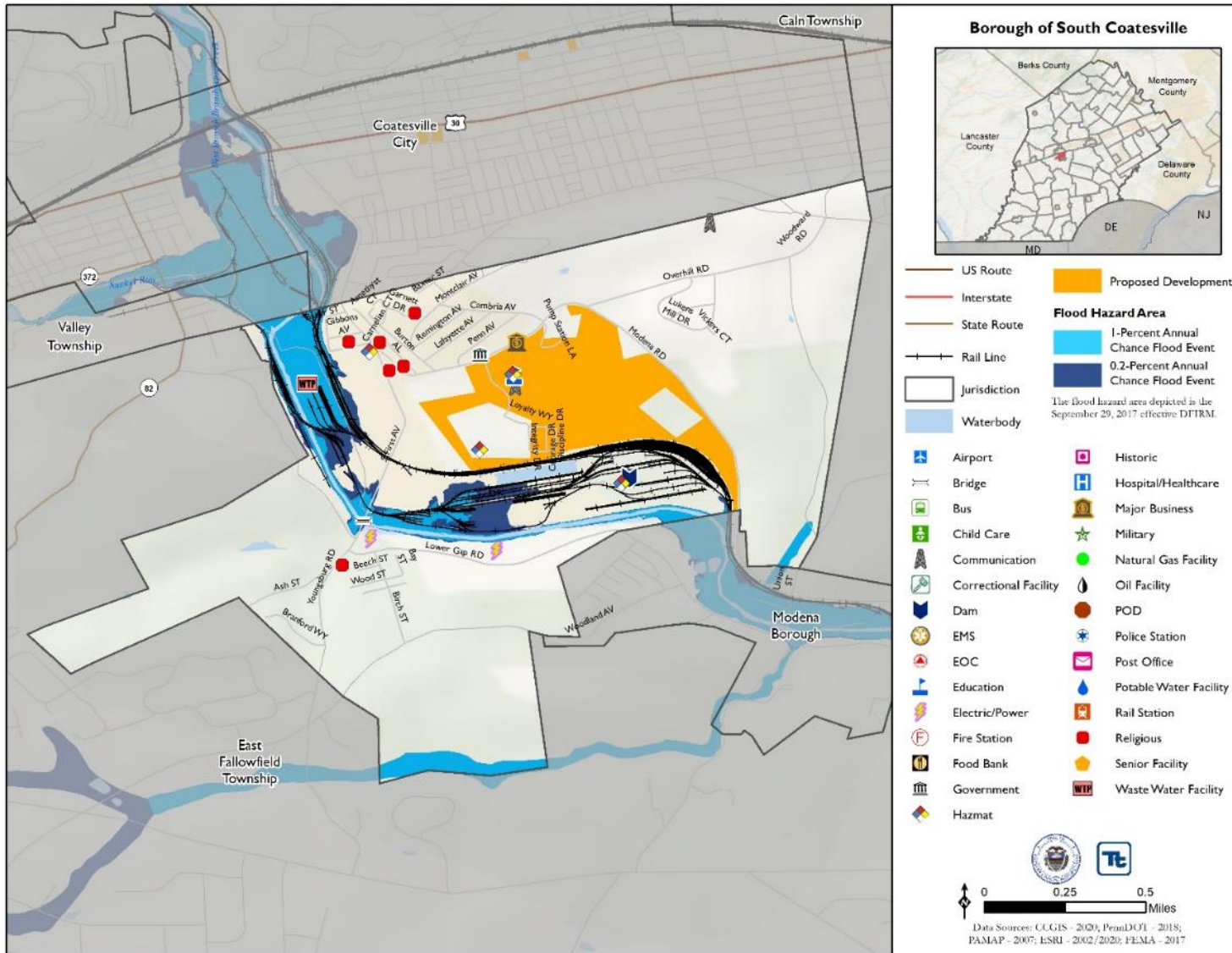
- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



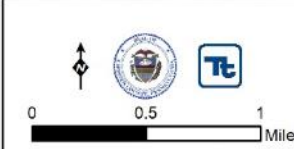
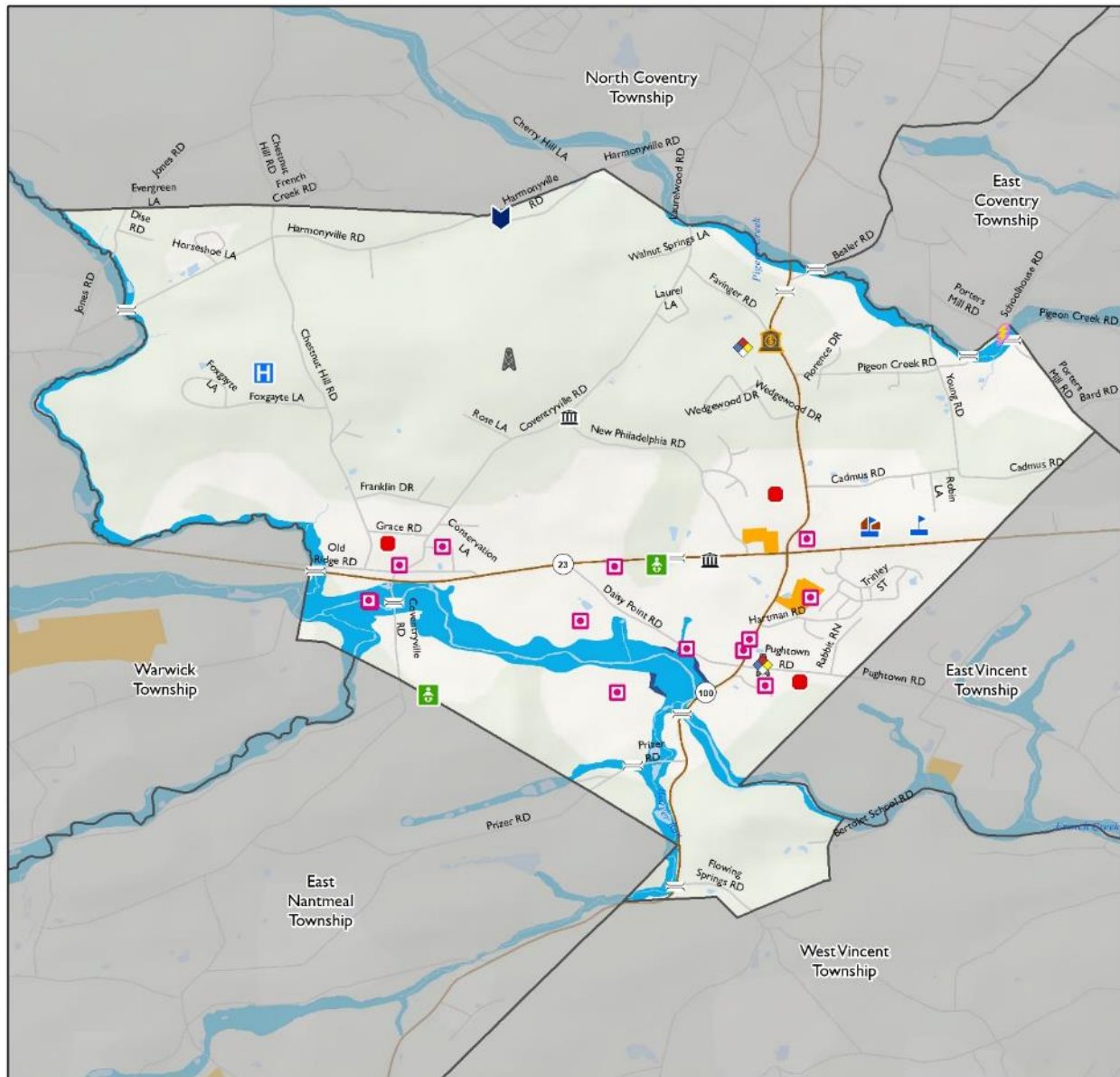


South Coatesville Borough





South Coventry Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT,MA - 2017

Township of South Coventry

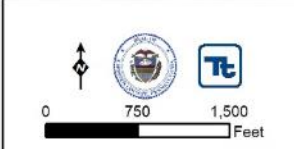
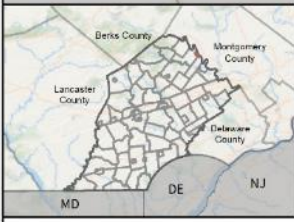
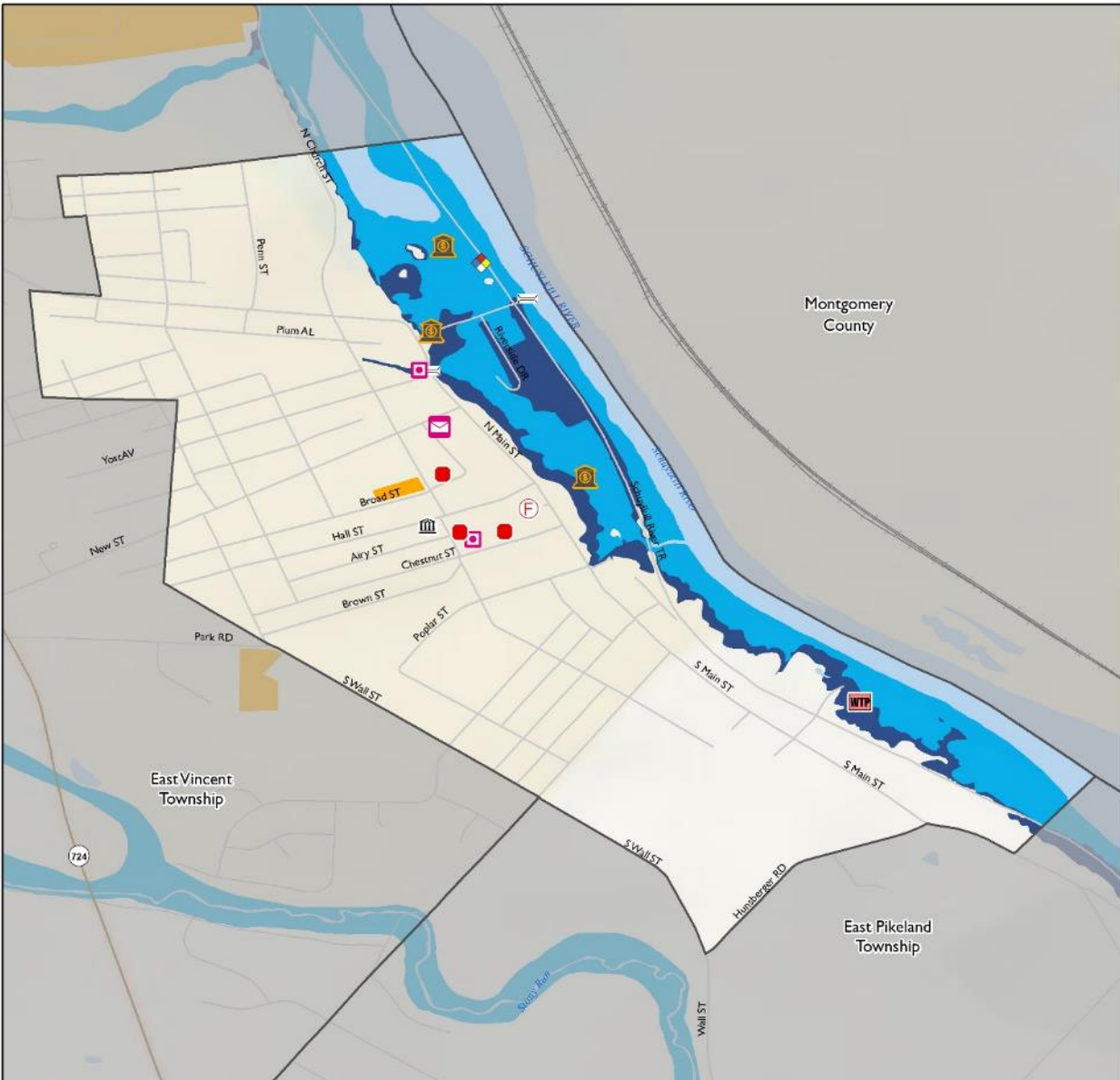
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
Flood Hazard Area	EMS	Military	Senior Facility
1-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
0.2-Percent Annual Chance Flood Event	Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.





Spring City Borough



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

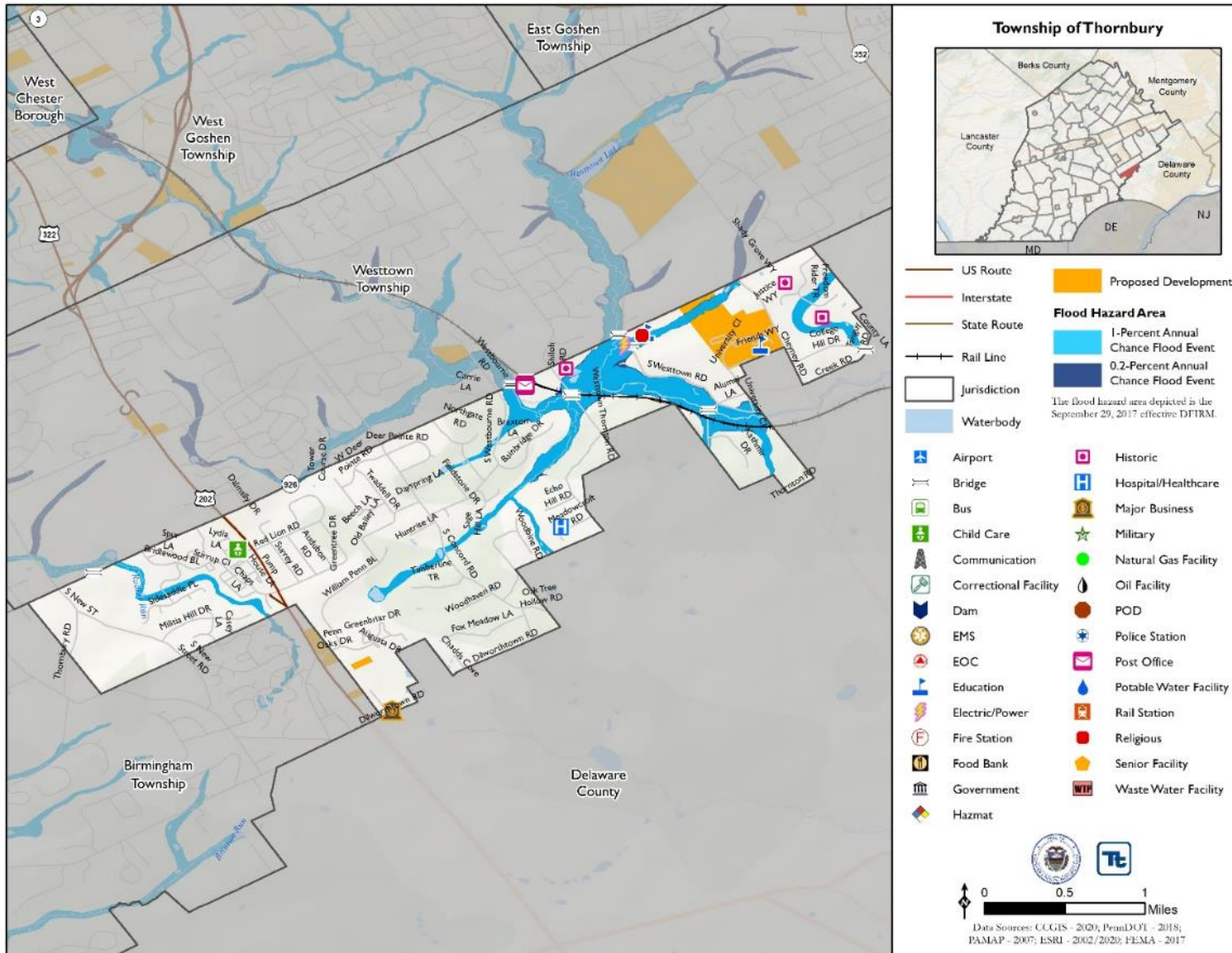
Borough of Spring City

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
Flood Hazard Area	EMS	Military	Senior Facility
1-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
0.2-Percent Annual Chance Flood Event	Education		

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

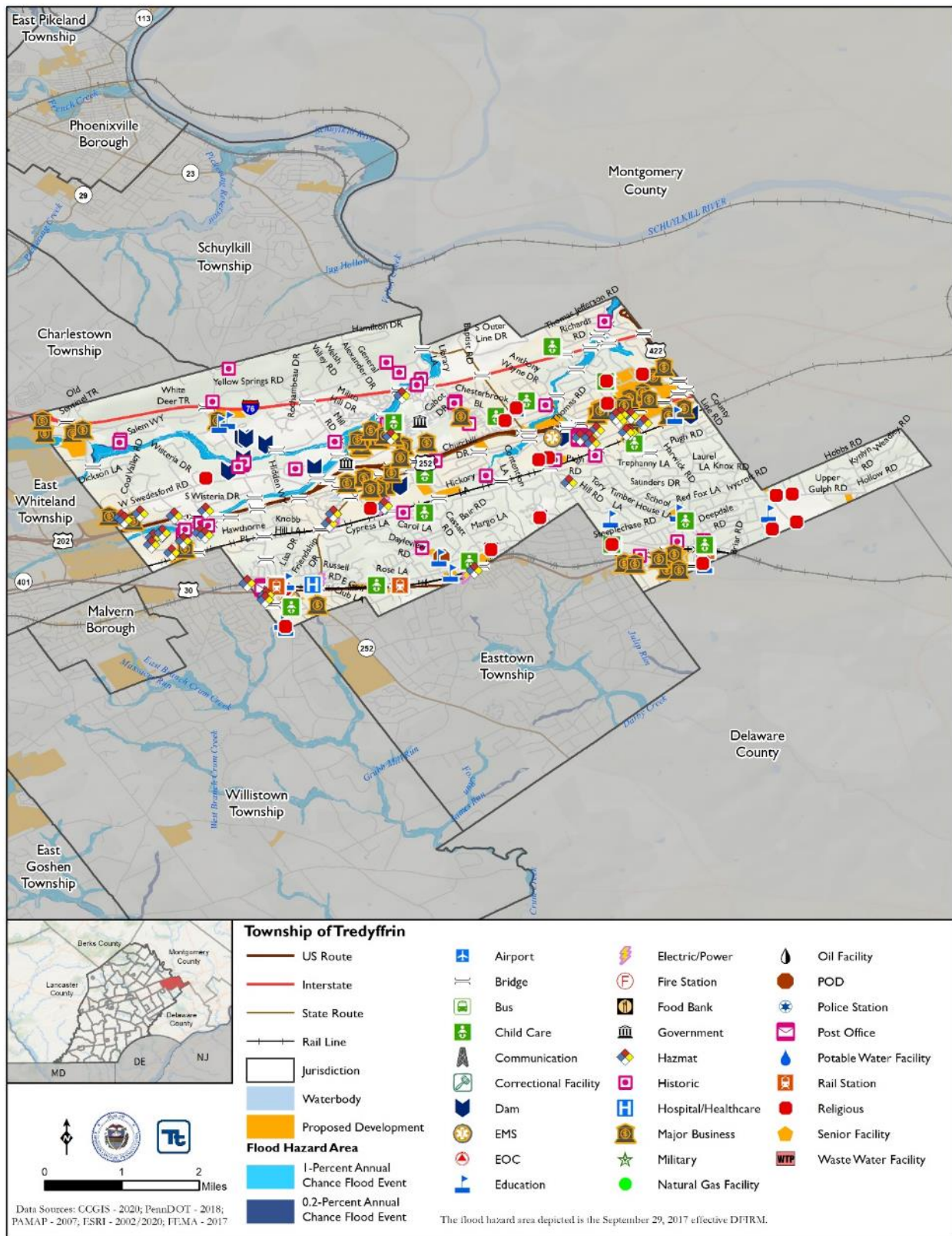


Thornbury Township



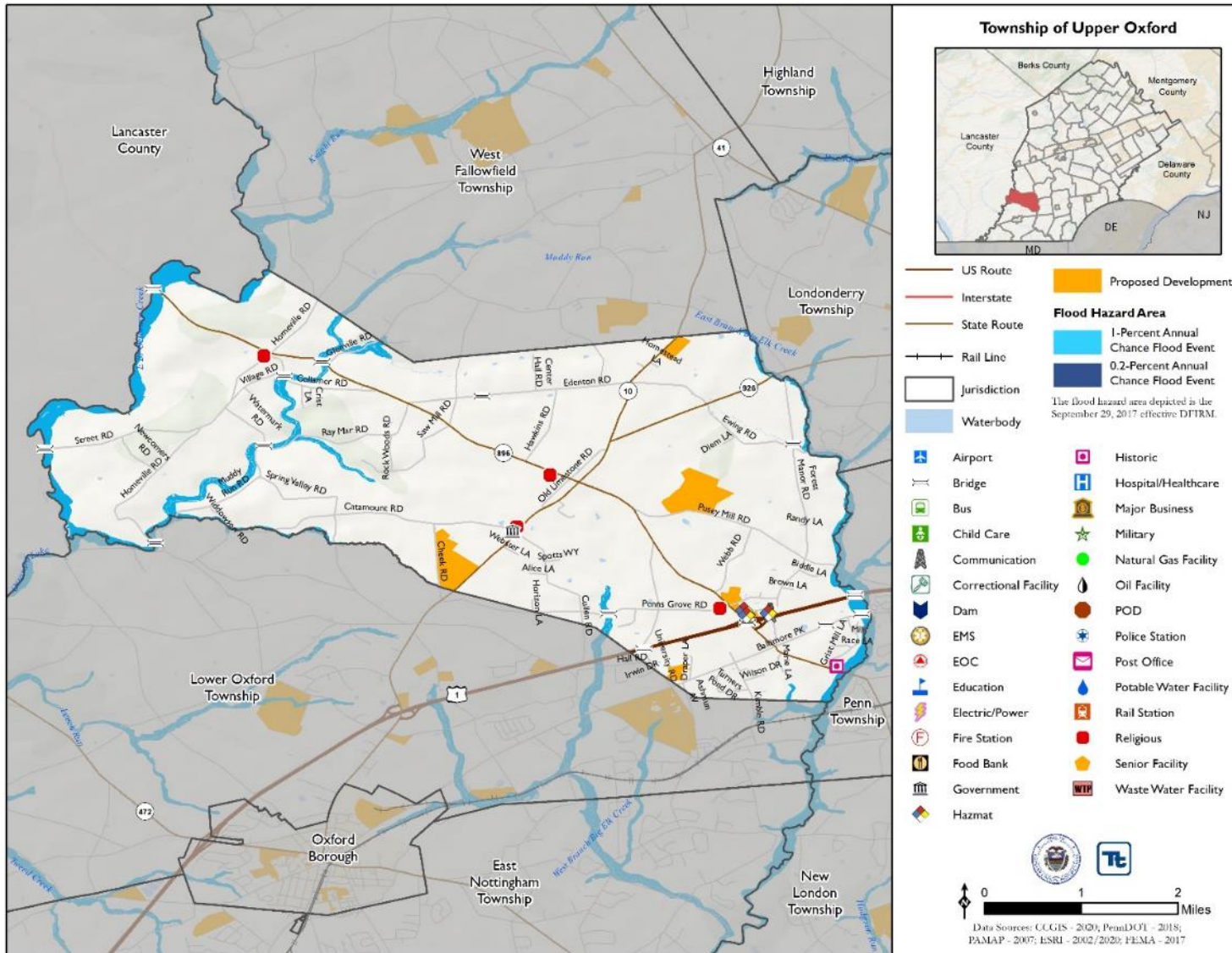


Tredyffrin Township



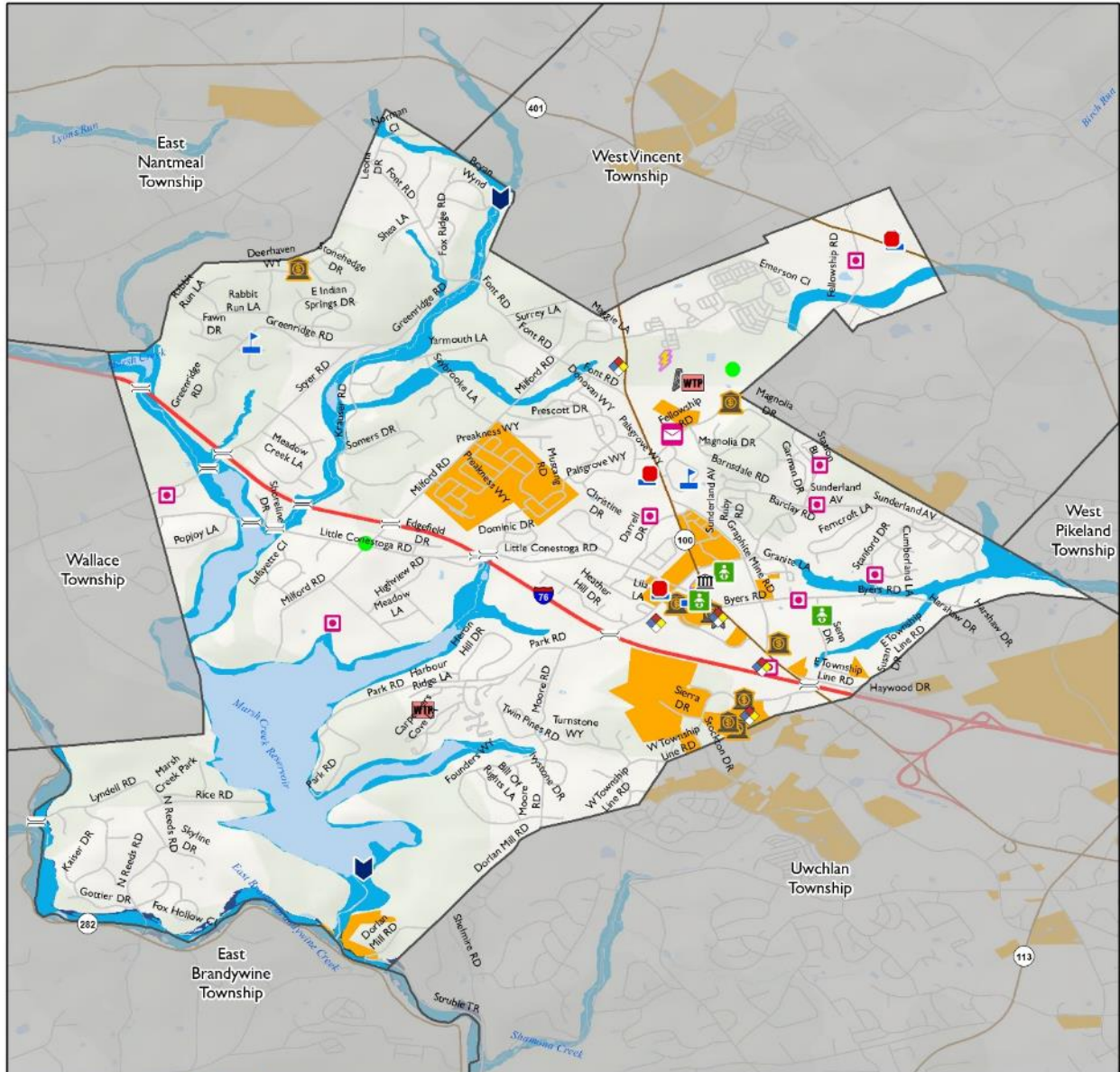


Upper Oxford Township





Upper Uwchlan Township



Township of Upper Uwchlan

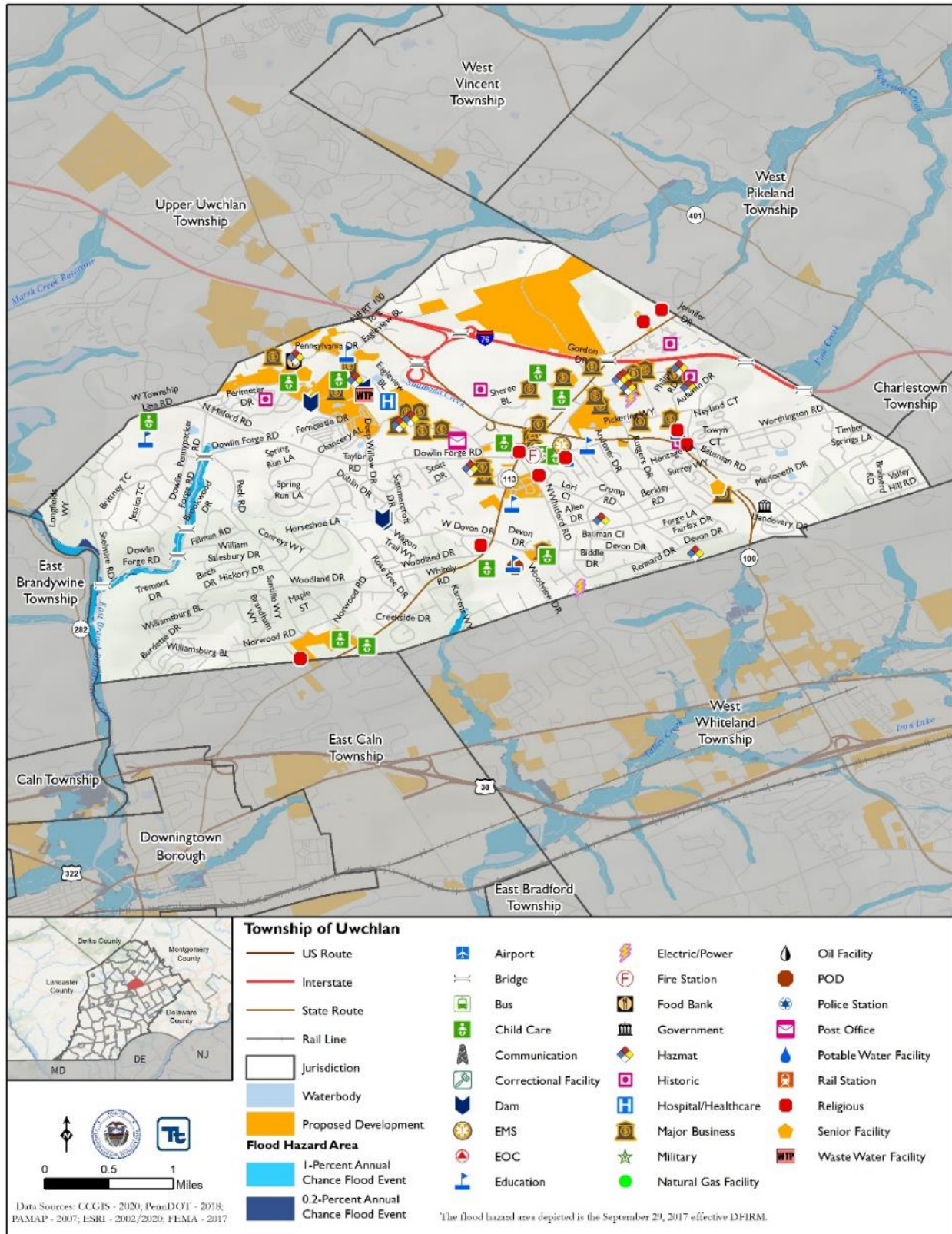
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
1-Percent Annual Chance Flood Event	EMS	Military	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Waste Water Facility	
	Education		

Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; ESRI - 2002/2020; FEMA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

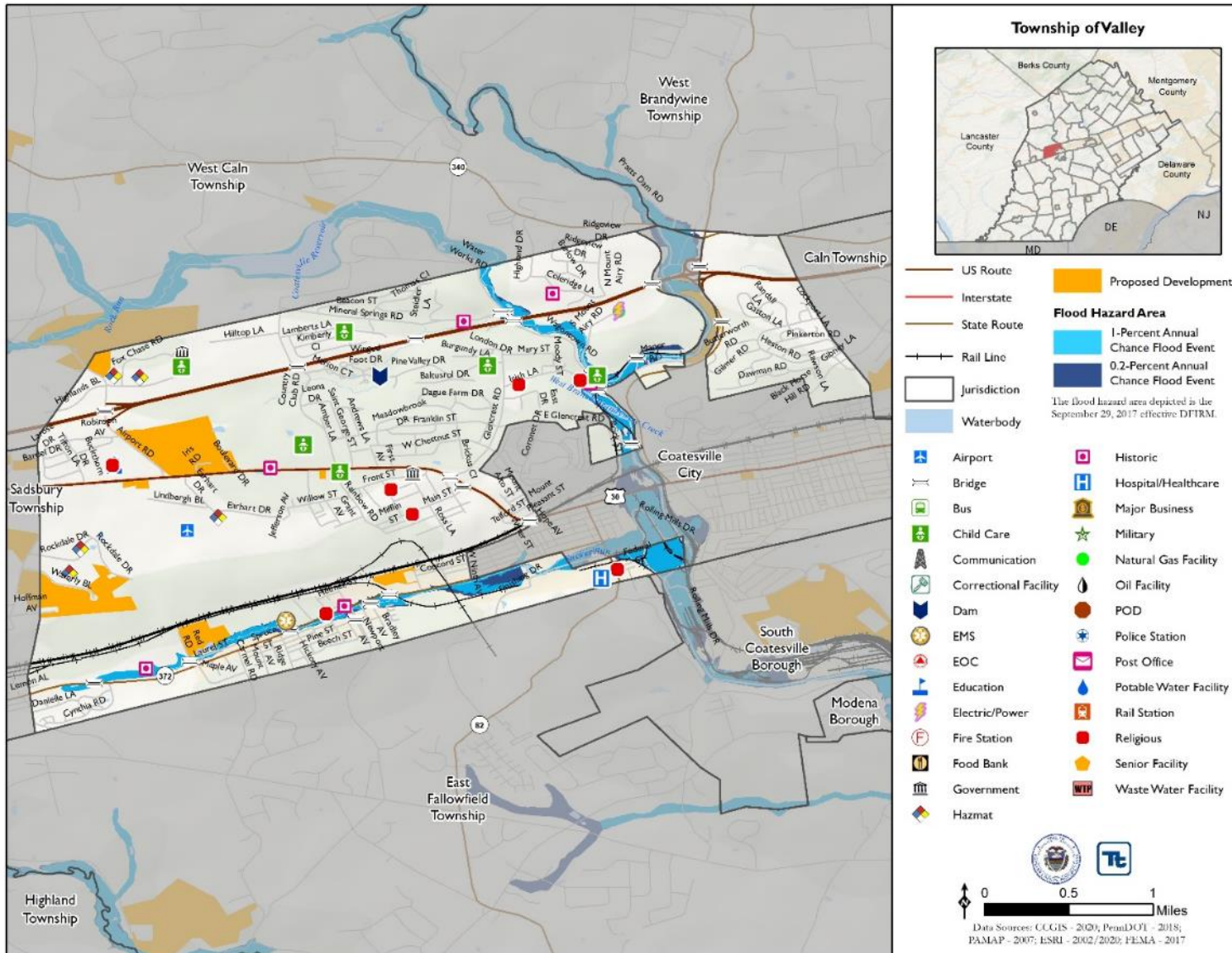


Uwchlan Township



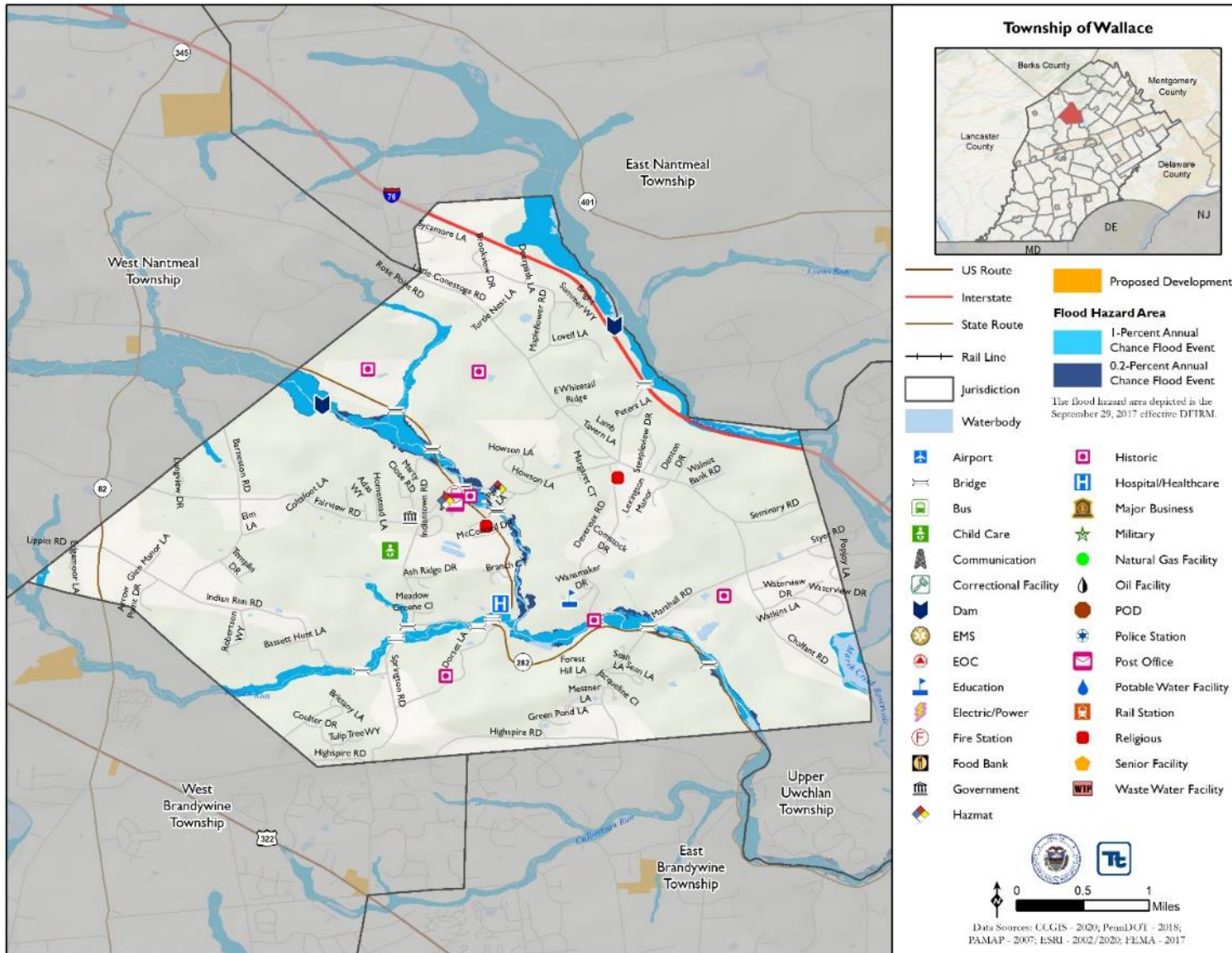


Valley Township



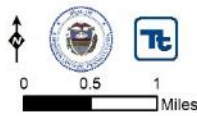
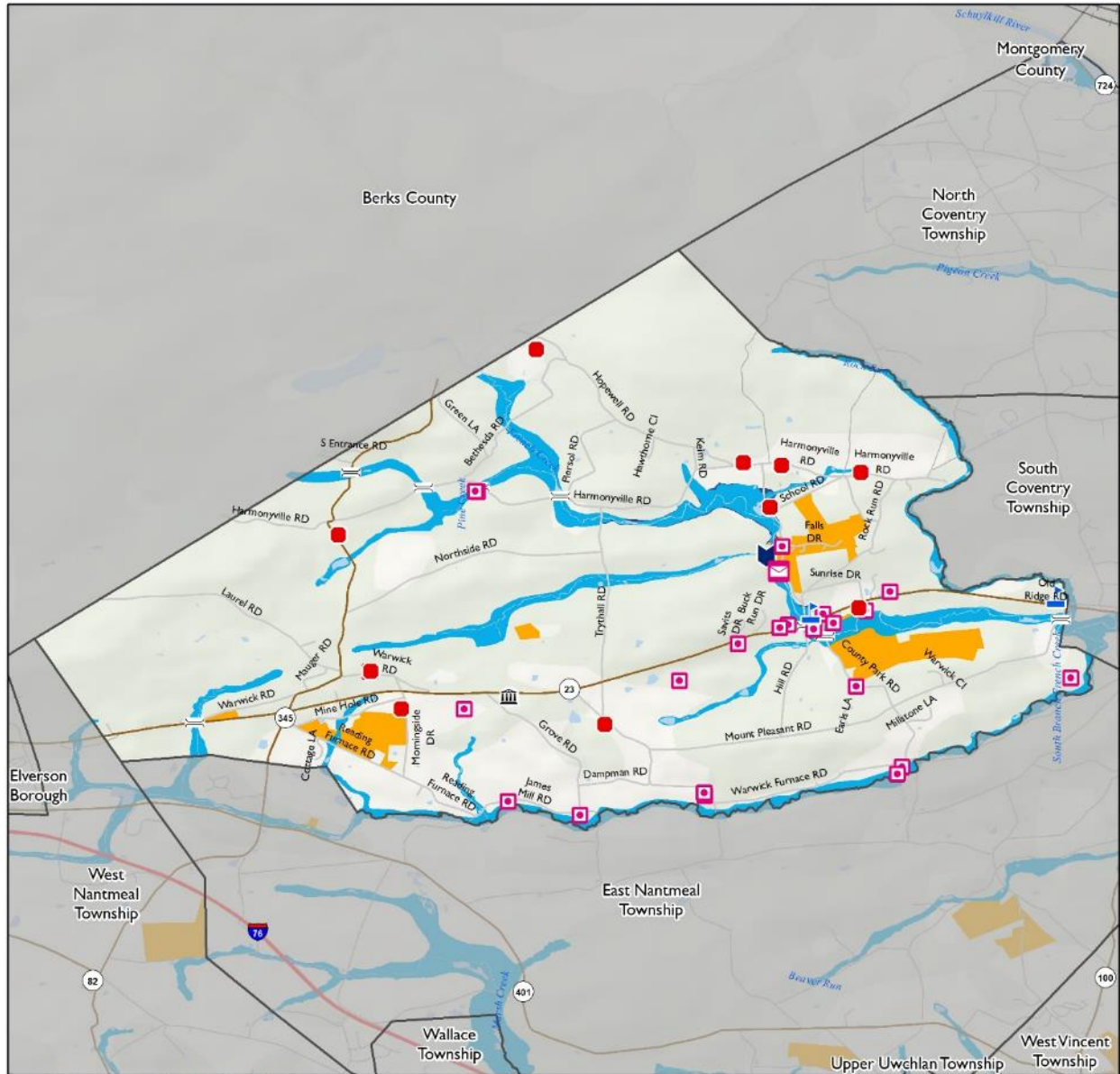


Wallace Township





Warwick Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT.MA - 2017

Township of Warwick

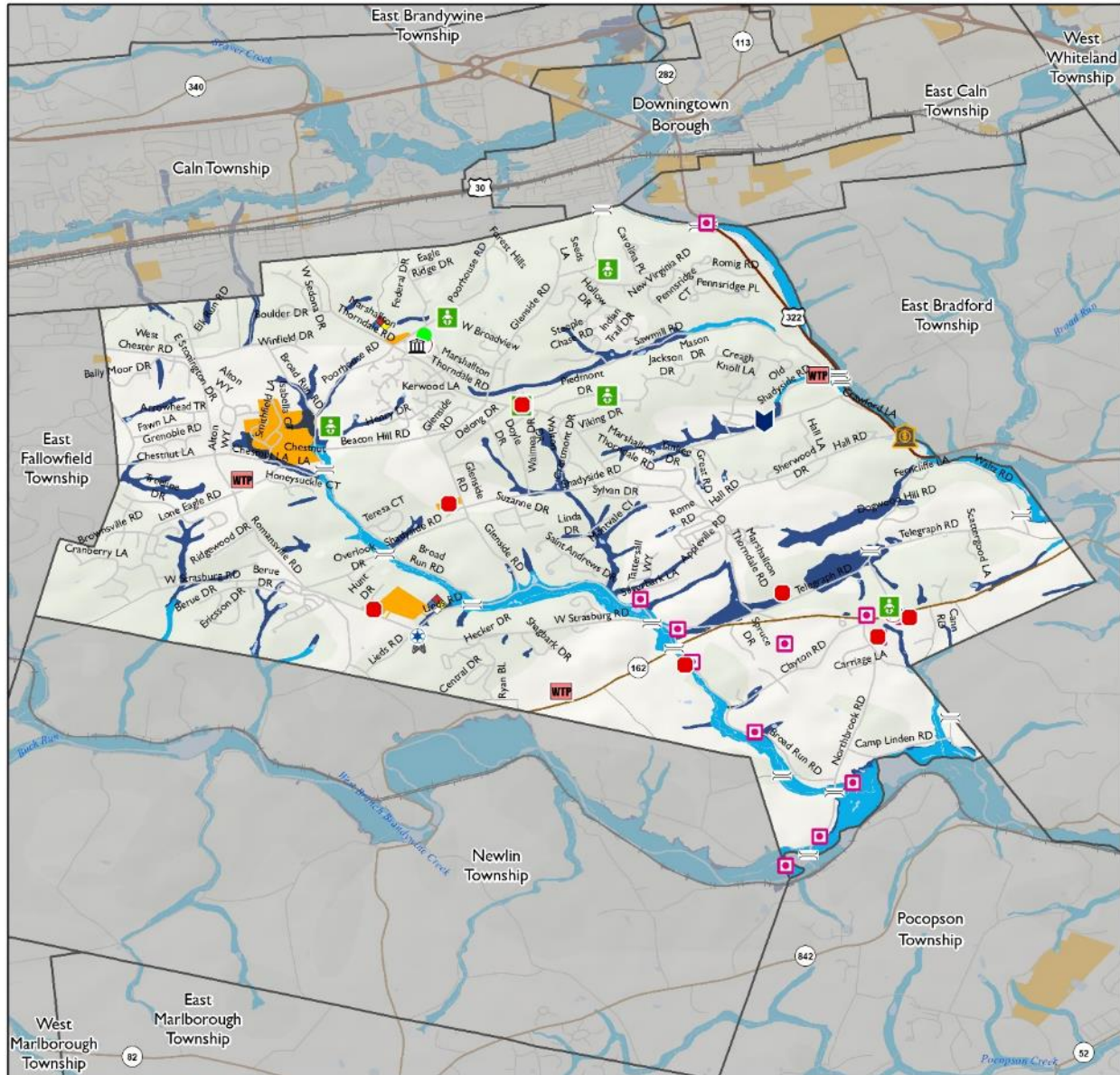
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Hospital/Healthcare | Rail Station |
| Dam | Major Business | Religious |
| EMS | Military | Senior Facility |
| EOC | Natural Gas Facility | Waste Water Facility |
| Education | | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



West Bradford Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of West Bradford

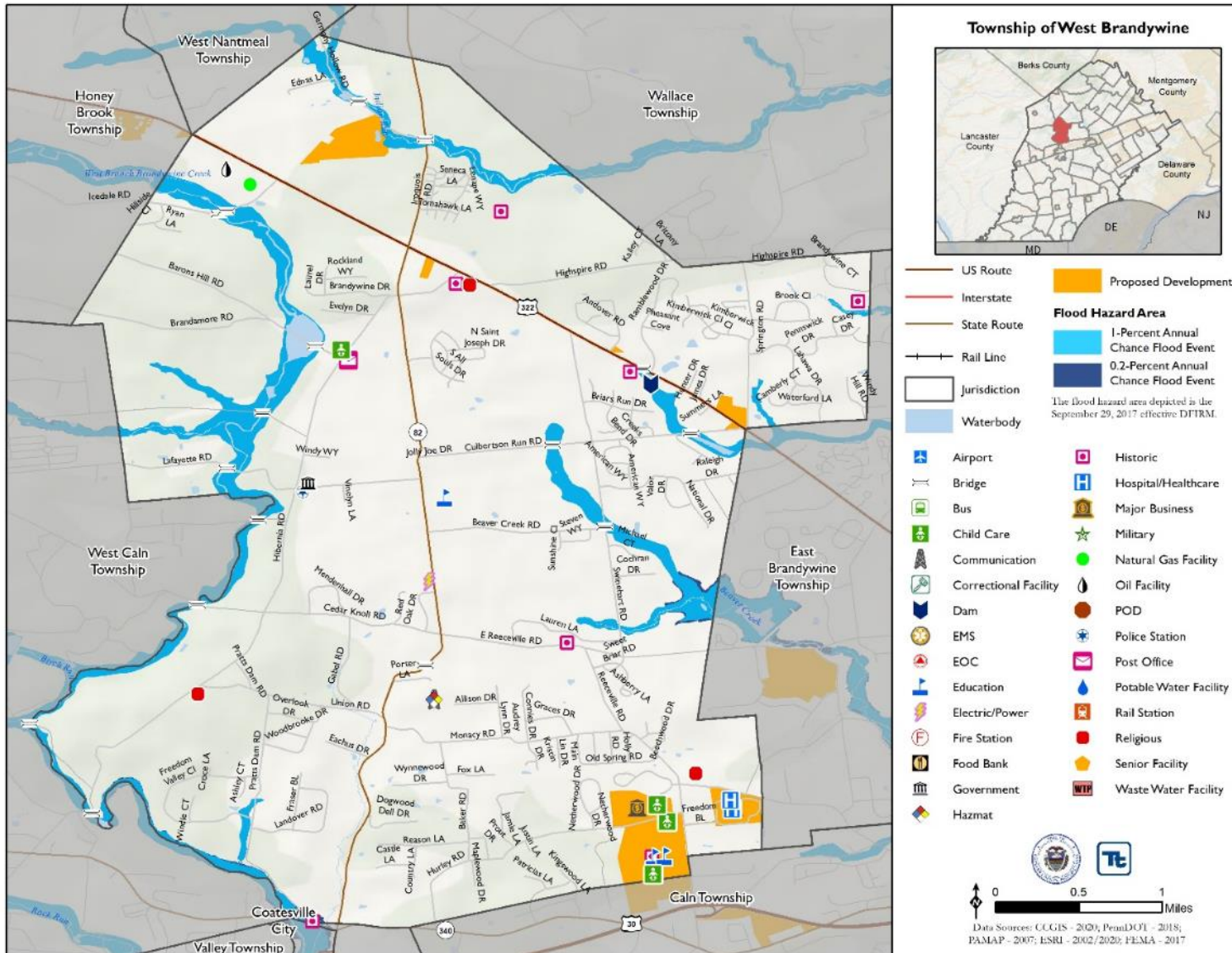
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
1-Percent Annual Chance Flood Event	EMS	Major Business	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
	Education	Natural Gas Facility	

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



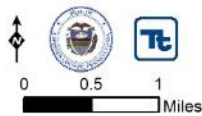
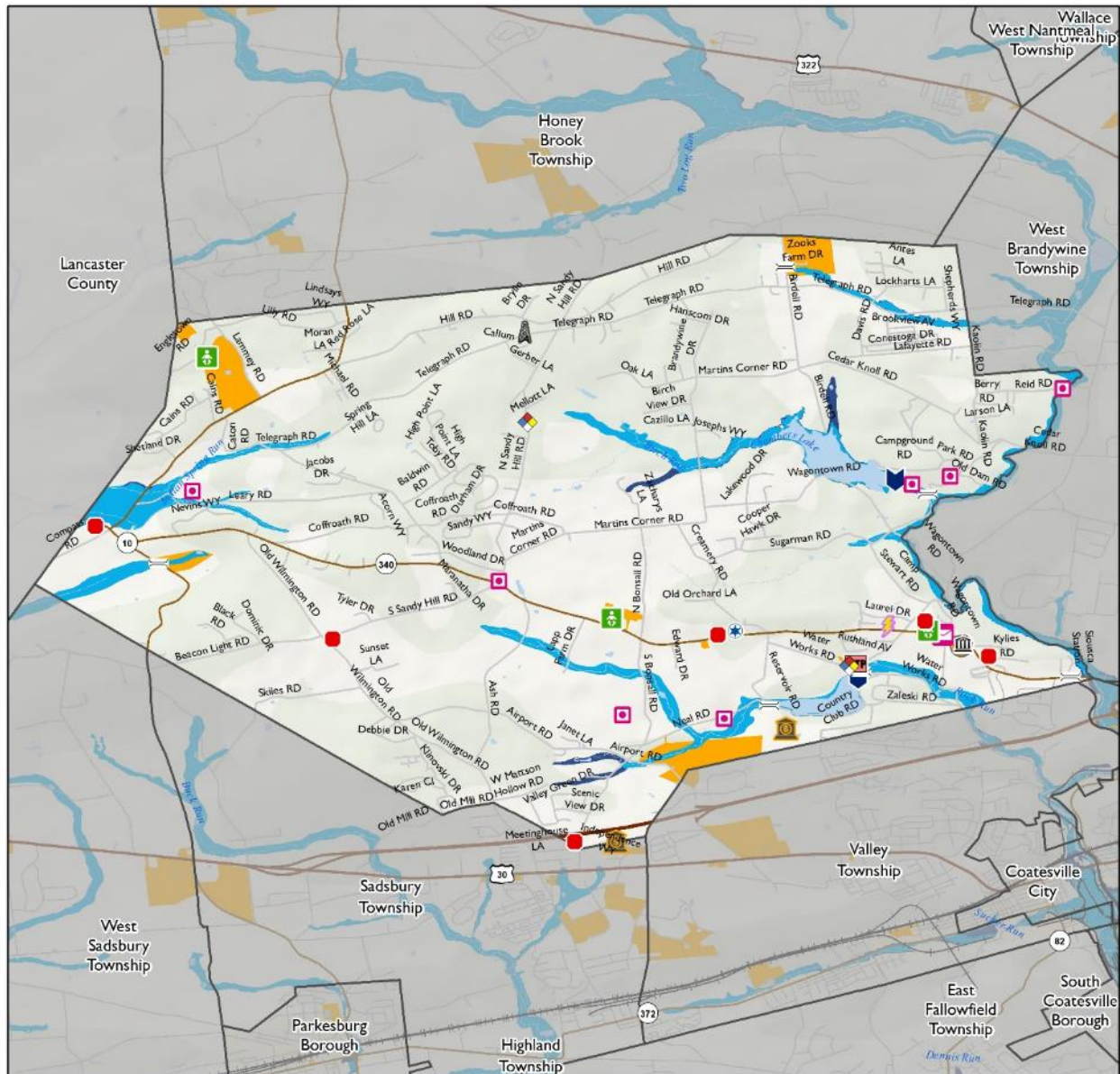


West Brandywine Township





West Caln Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FEMA - 2017

Township of West Caln

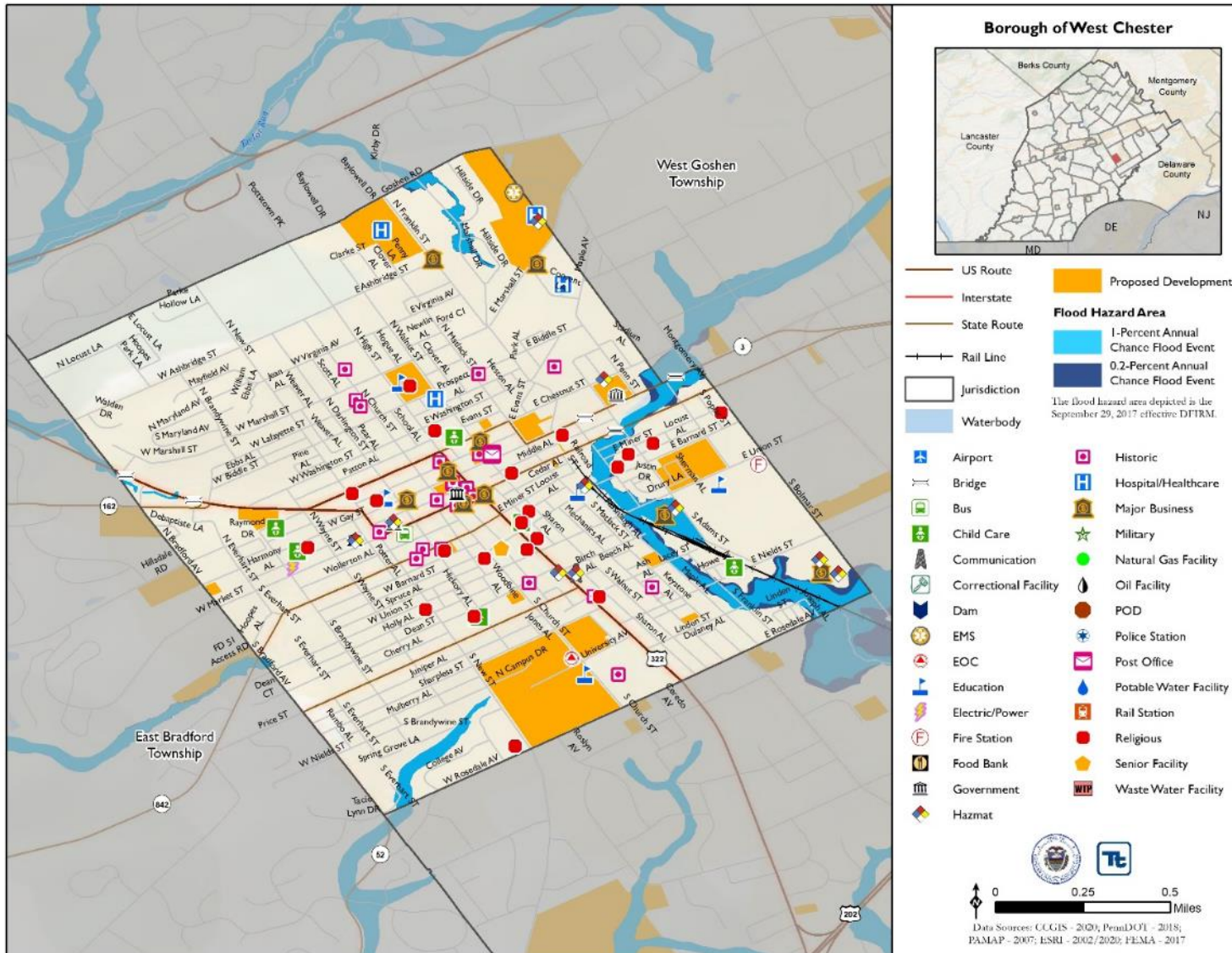
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- Airport
- Bridge
- Bus
- Child Care
- Communication
- Correctional Facility
- Dam
- EMS
- EOC
- Education
- Electric/Power
- Fire Station
- Food Bank
- Government
- Hazmat
- Historic
- Hospital/Healthcare
- Major Business
- Military
- Natural Gas Facility
- Oil Facility
- POD
- Police Station
- Post Office
- Potable Water Facility
- Rail Station
- Religious
- Senior Facility
- Waste Water Facility

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

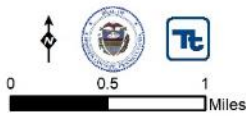
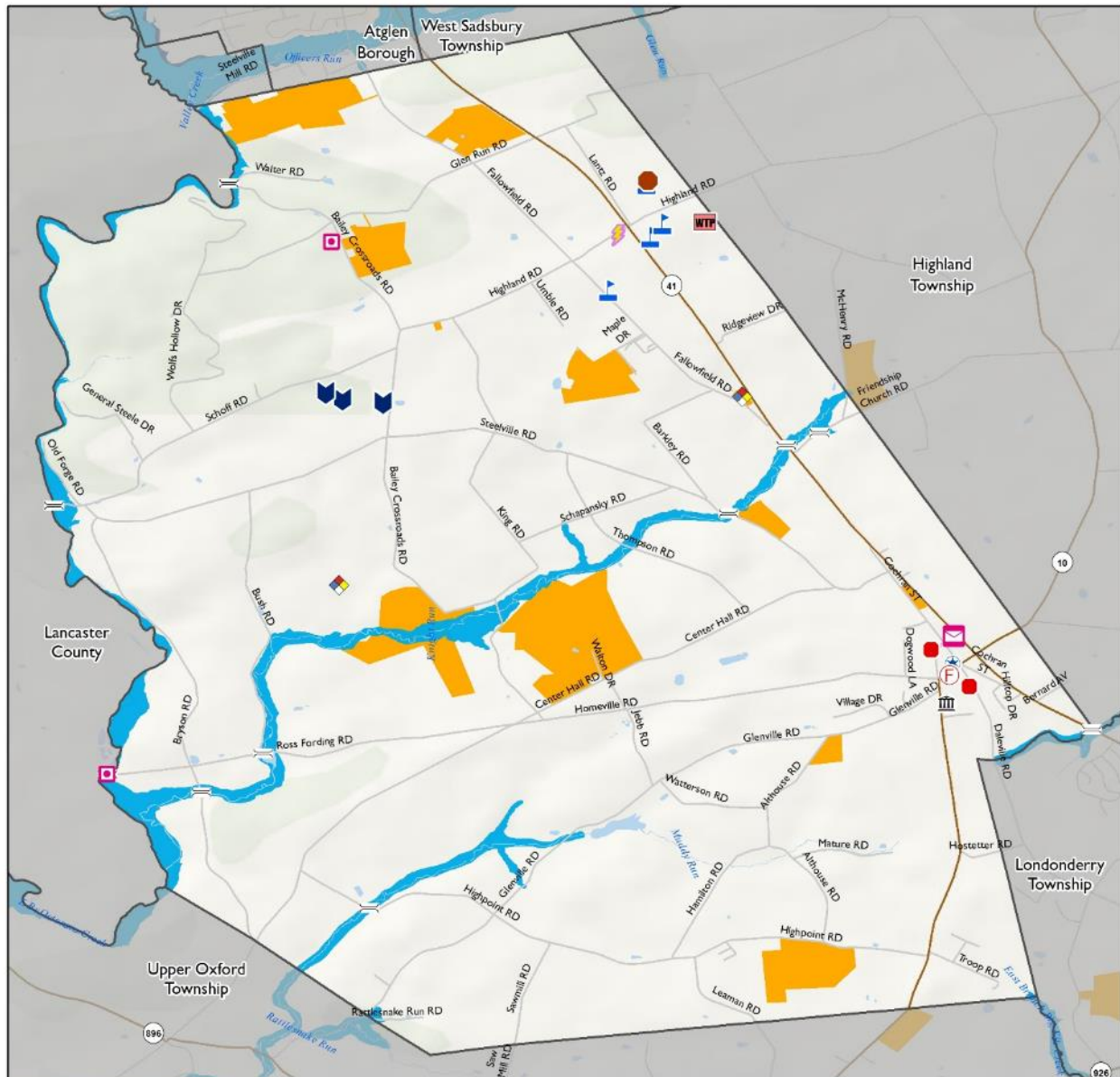


West Chester Borough





West Fallowfield Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of West Fallowfield

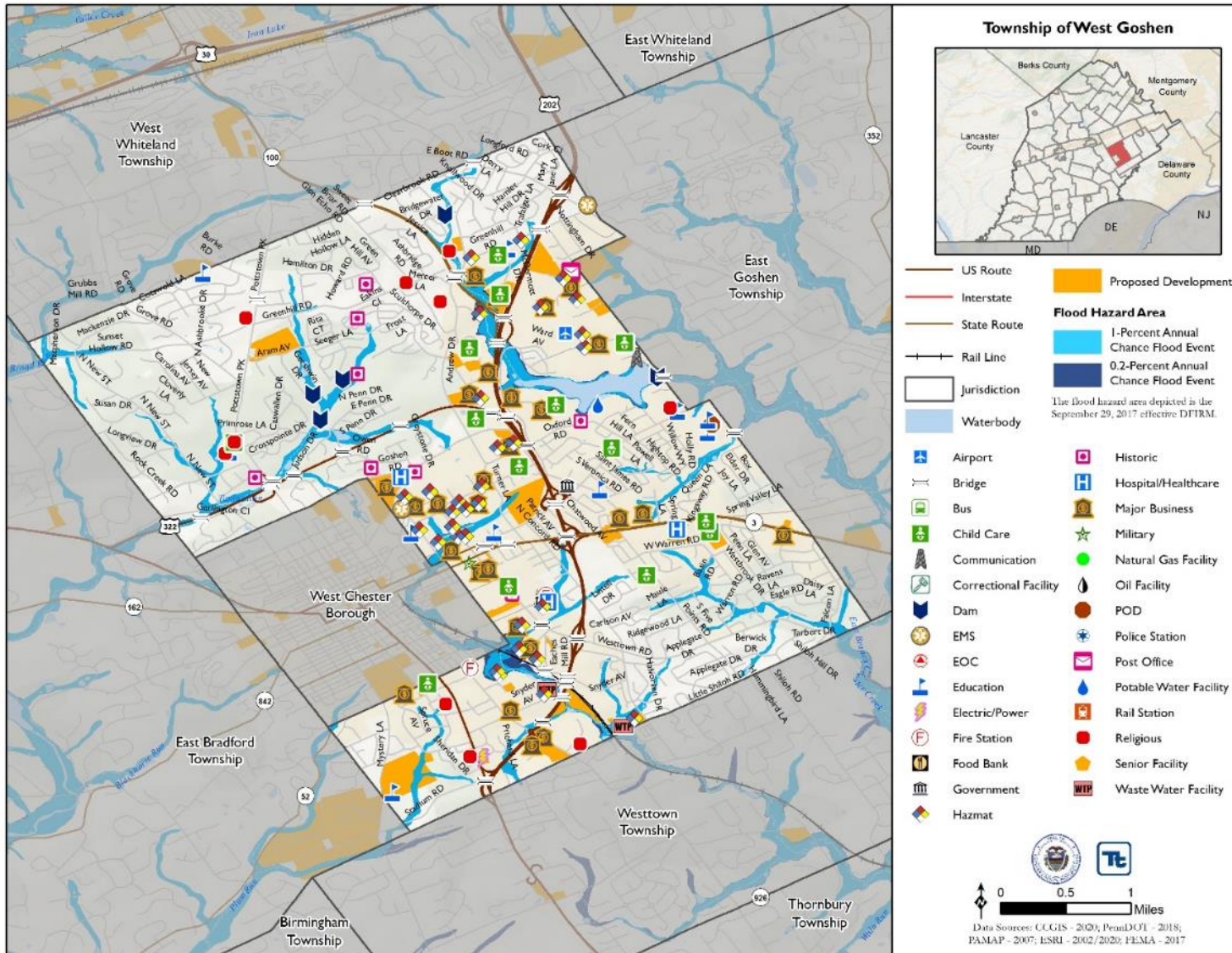
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Hospital/Healthcare	Rail Station
Proposed Development	Dam	Major Business	Religious
1-Percent Annual Chance Flood Event	EMS	Military	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Natural Gas Facility	Waste Water Facility
	Education		

The flood hazard area depicted is the September 29, 2017 effective DFTRM.



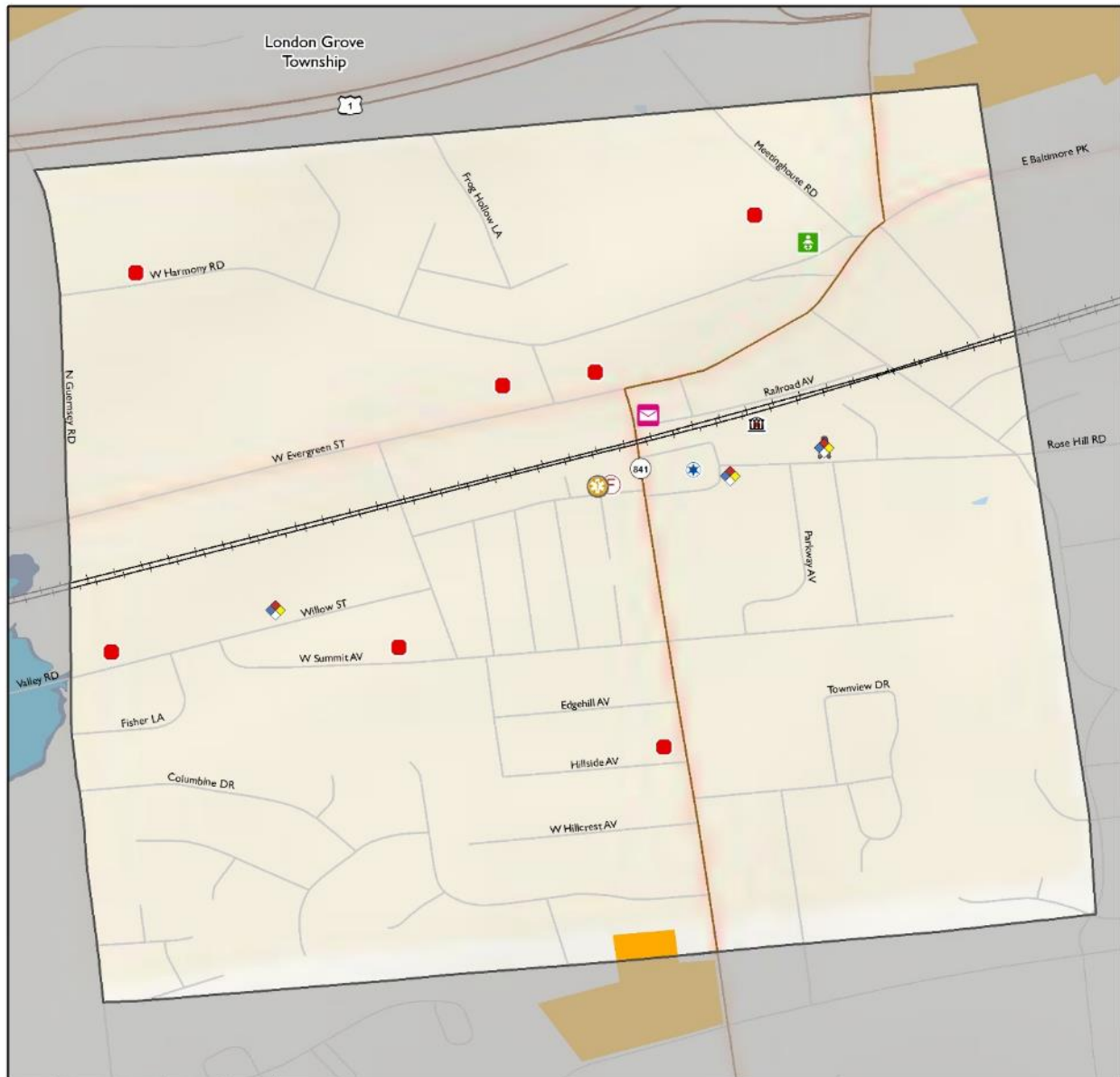


West Goshen Township





West Grove Borough



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020, FEMA - 2017

Borough of West Grove

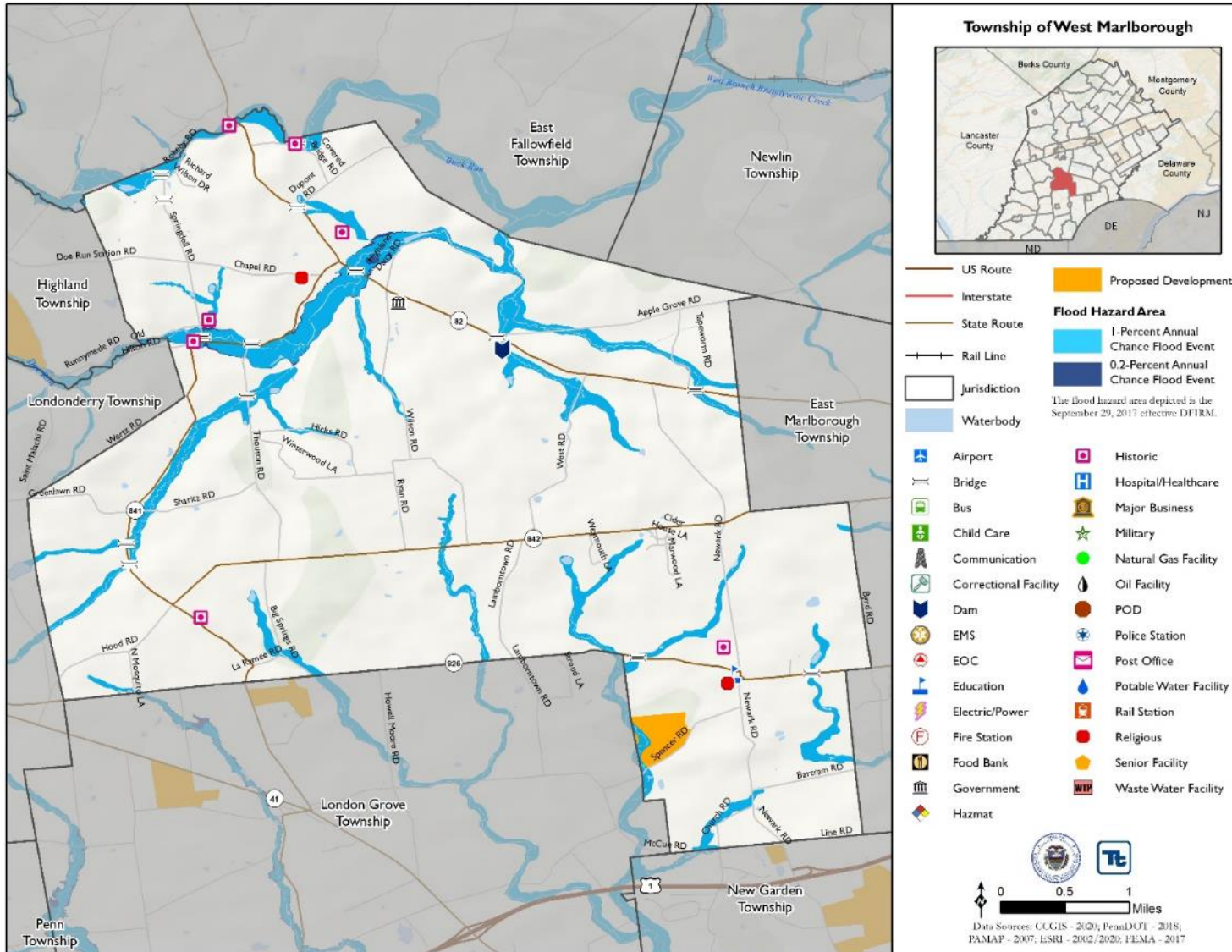
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- | | | |
|-----------------------|----------------------|------------------------|
| Airport | Electric/Power | Oil Facility |
| Bridge | Fire Station | POD |
| Bus | Food Bank | Police Station |
| Child Care | Government | Post Office |
| Communication | Hazmat | Potable Water Facility |
| Correctional Facility | Historic | Rail Station |
| Dam | Hospital/Healthcare | Religious |
| EMS | Major Business | Senior Facility |
| EOC | Military | Waste Water Facility |
| Education | Natural Gas Facility | |

The flood hazard area depicted is the September 29, 2017 effective DFIRM.

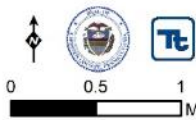
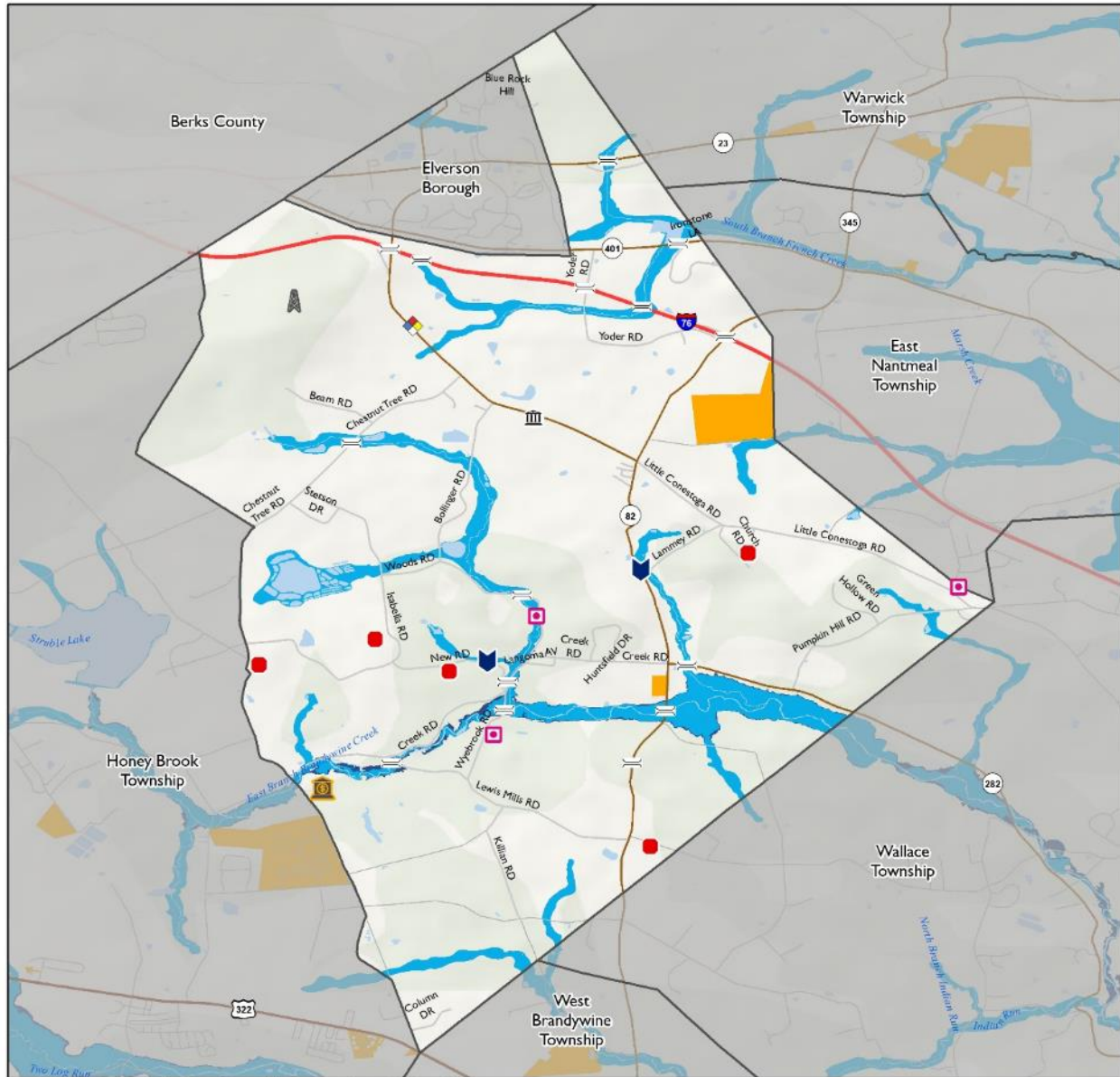


West Marlborough Township





West Nantmeal Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FT,MA - 2017

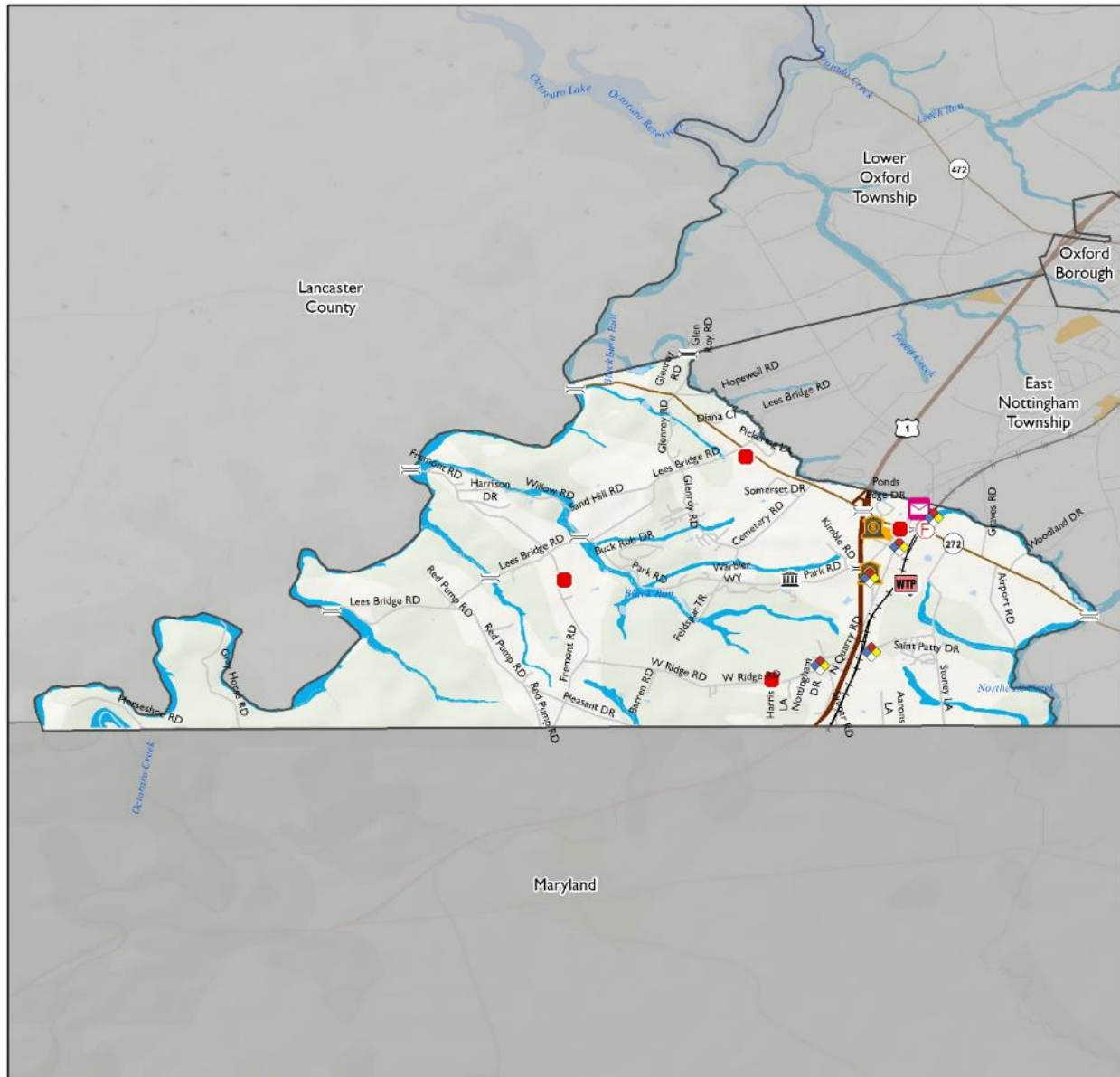
Township of West Nantmeal

US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
1-Percent Annual Chance Flood Event	EMS	Major Business	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
	Education	Natural Gas Facility	

The flood hazard area depicted is the September 29, 2017 effective DFIRM.



West Nottingham Township



MD DE NJ

Township of West Nottingham

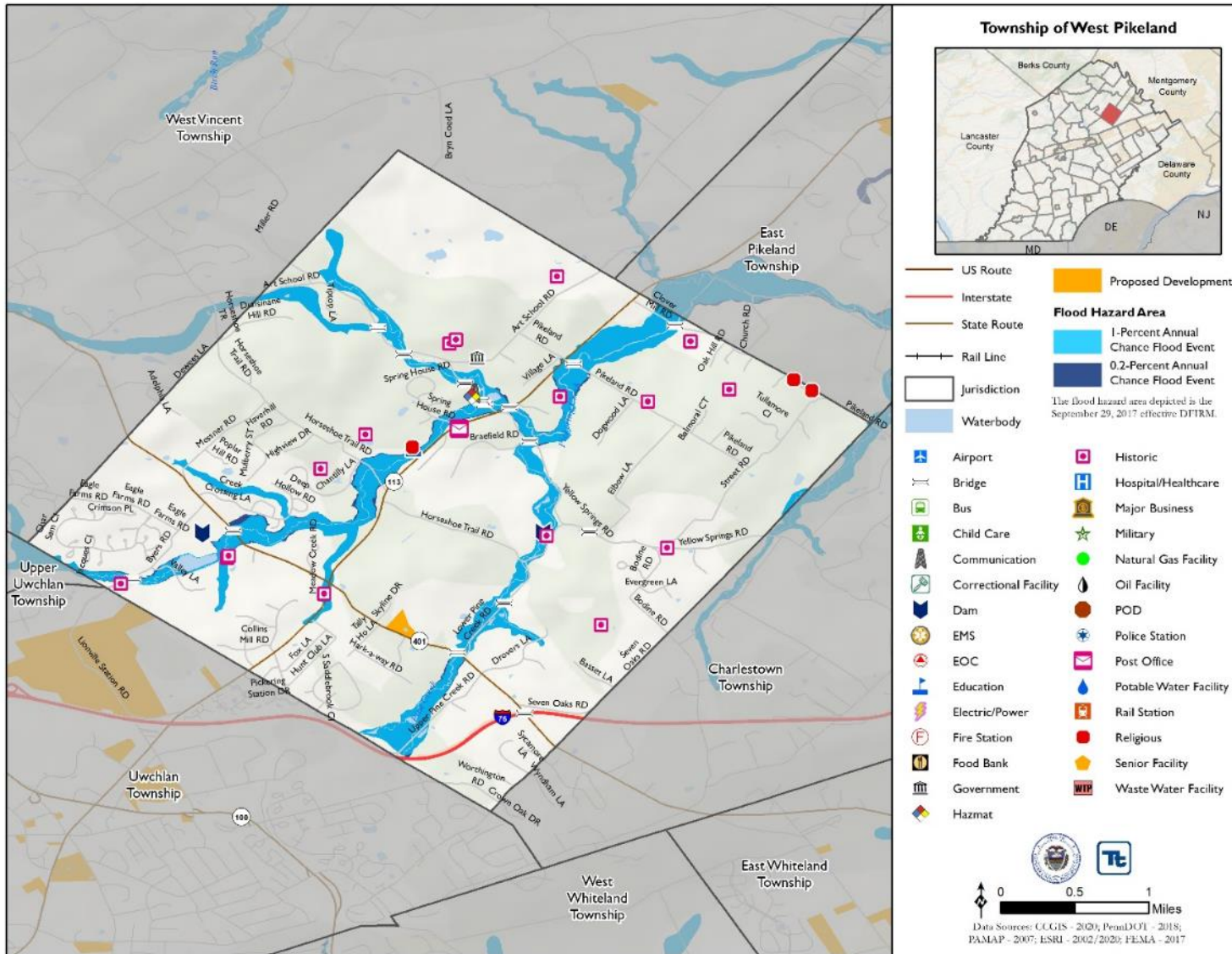
US Route	Airport	Electric/Power	Oil Facility
Interstate	Bridge	Fire Station	POD
State Route	Bus	Food Bank	Police Station
Rail Line	Child Care	Government	Post Office
Jurisdiction	Communication	Hazmat	Potable Water Facility
Waterbody	Correctional Facility	Historic	Rail Station
Proposed Development	Dam	Hospital/Healthcare	Religious
1-Percent Annual Chance Flood Event	EMS	Major Business	Senior Facility
0.2-Percent Annual Chance Flood Event	EOC	Military	Waste Water Facility
	Education	Natural Gas Facility	

Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFTRM.

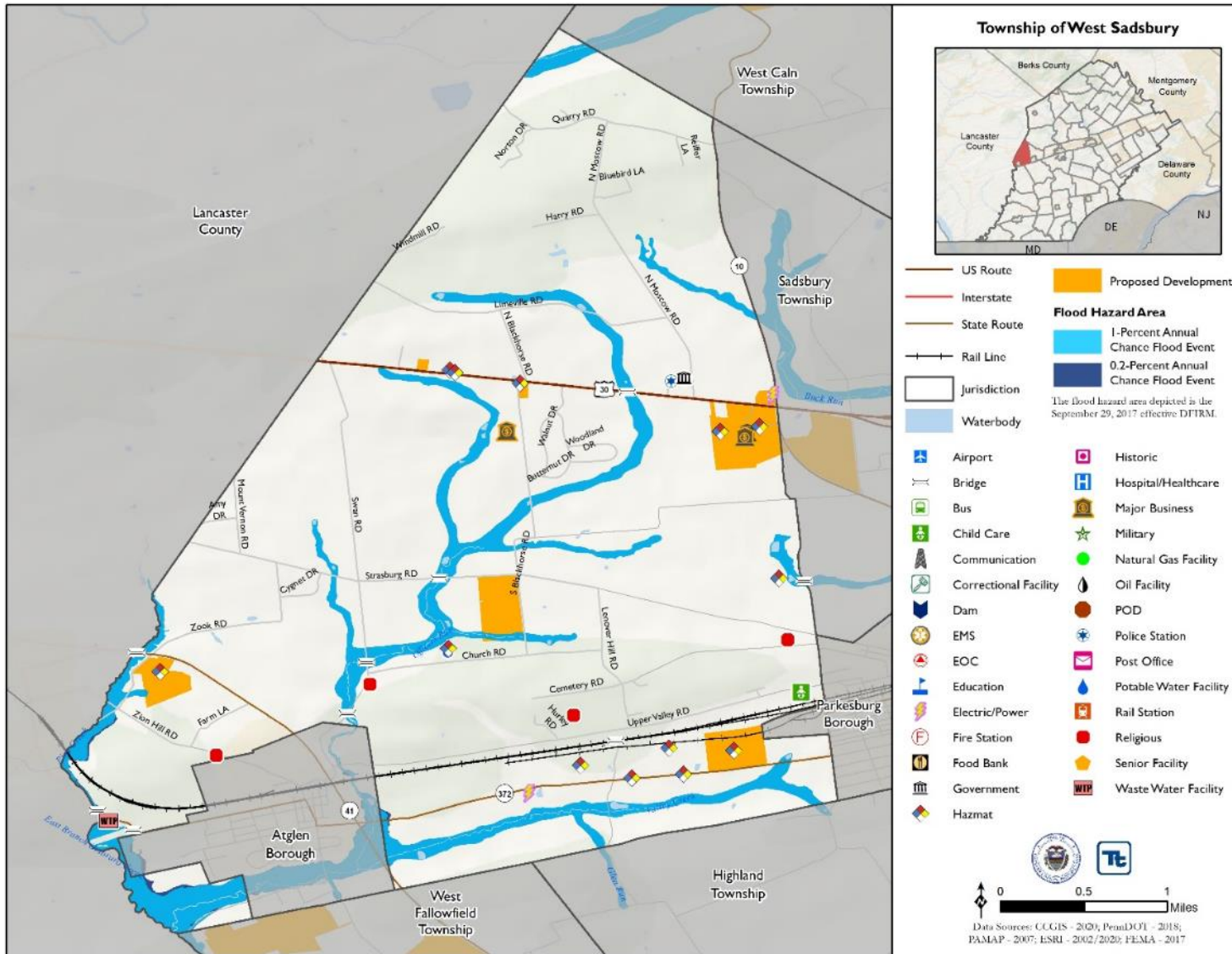


West Pikeland Township



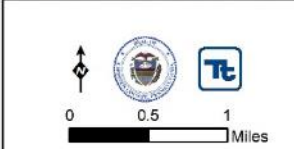
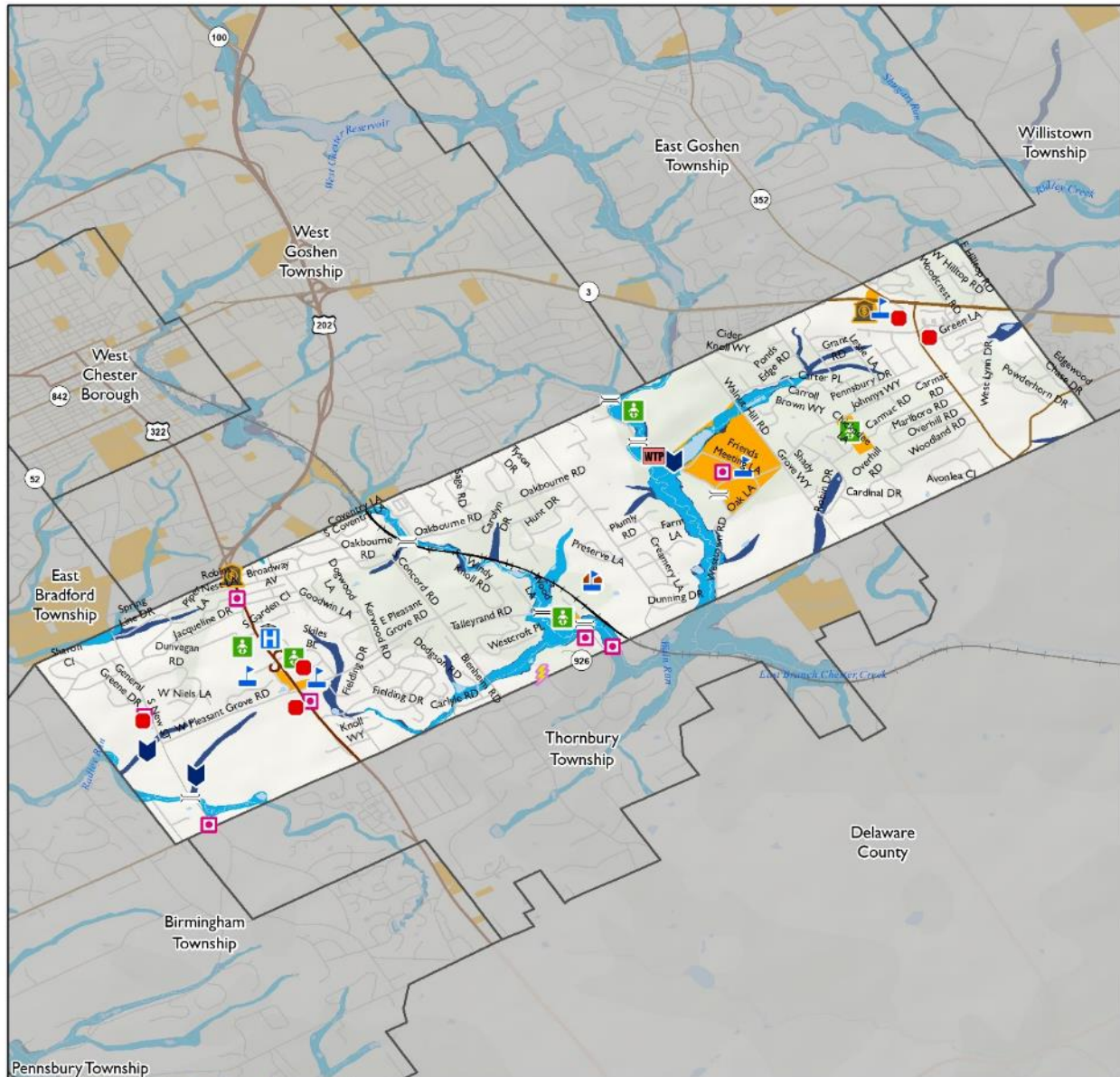


West Sadsbury Township





Westtown Township



Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

Township of Westtown

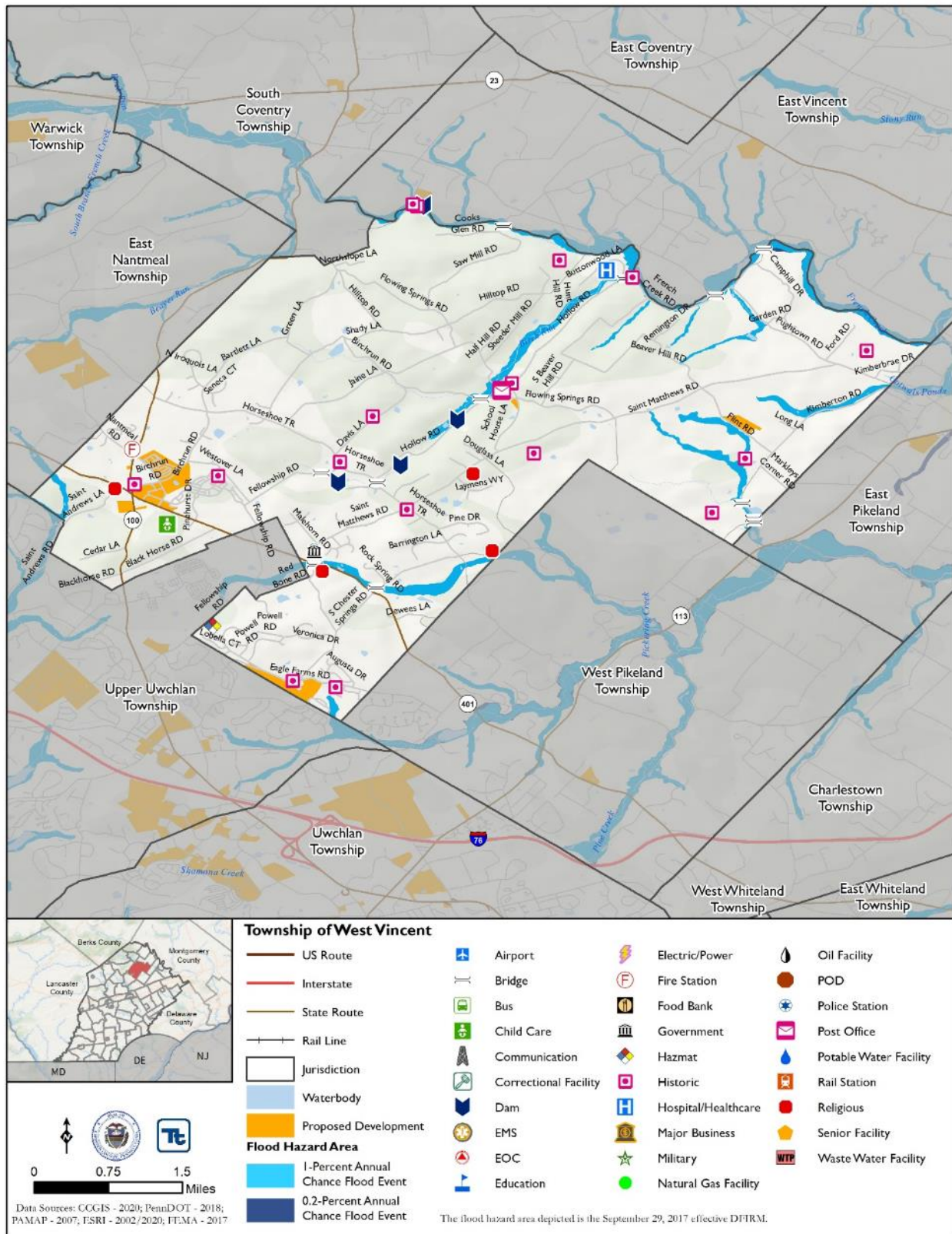
- US Route
- Interstate
- State Route
- Rail Line
- Jurisdiction
- Waterbody
- Proposed Development
- Flood Hazard Area**
- 1-Percent Annual Chance Flood Event
- 0.2-Percent Annual Chance Flood Event

- Airport
- Bridge
- Bus
- Child Care
- Communication
- Correctional Facility
- Dam
- EMS
- EOC
- Education
- Electric/Power
- Fire Station
- Food Bank
- Government
- Hazmat
- Historic
- Hospital/Healthcare
- Major Business
- Military
- Natural Gas Facility
- Oil Facility
- POD
- Police Station
- Post Office
- Potable Water Facility
- Rail Station
- Religious
- Senior Facility
- Waste Water Facility

The flood hazard area depicted is the September 29, 2017 effective DFTRM.

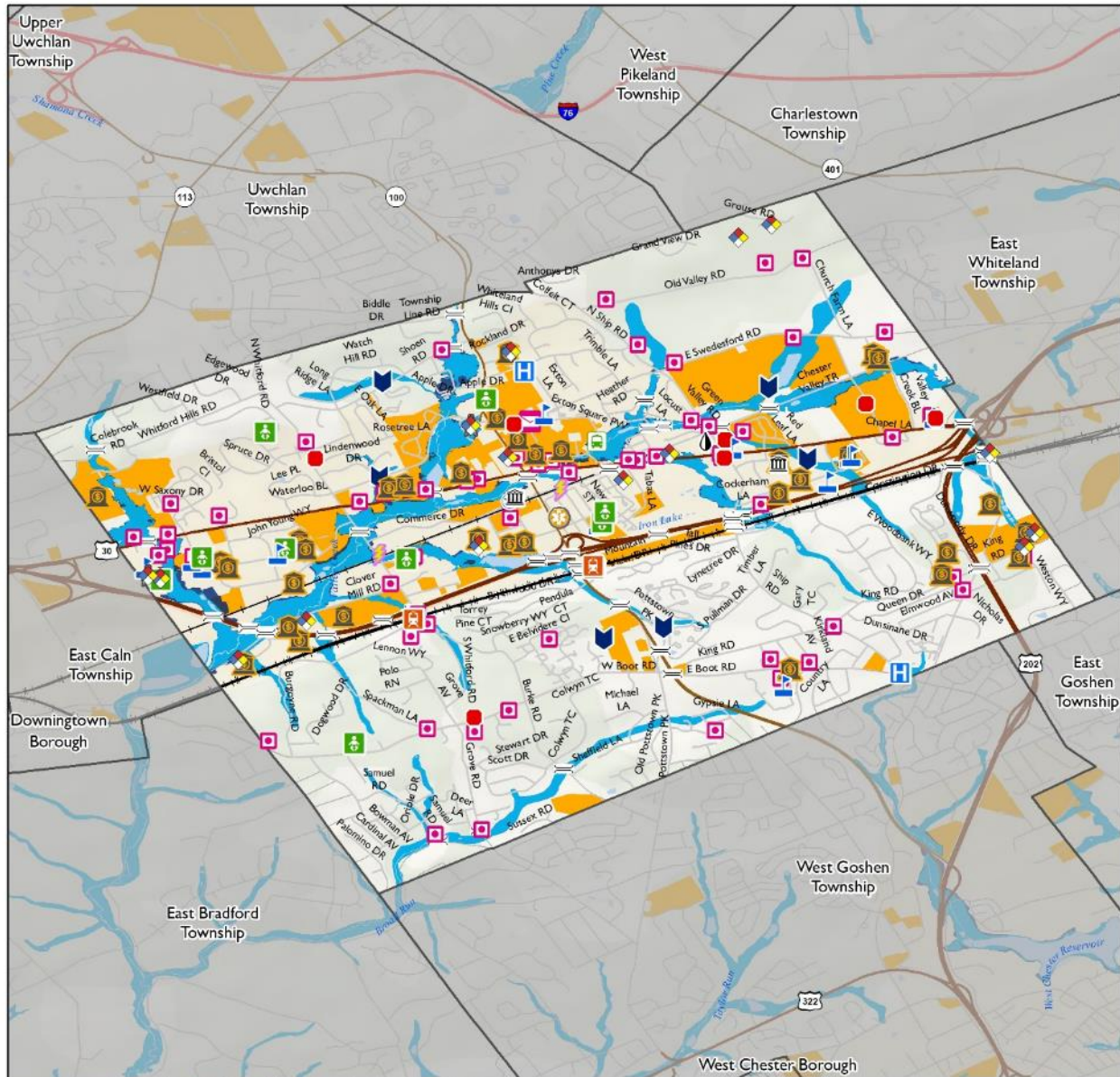


West Vincent Township





West Whiteland Township



Township of West Whiteland

- | | | | |
|---------------------------------------|-----------------------|----------------------|------------------------|
| US Route | Airport | Electric/Power | Oil Facility |
| Interstate | Bridge | Fire Station | POD |
| State Route | Bus | Food Bank | Police Station |
| Rail Line | Child Care | Government | Post Office |
| Jurisdiction | Communication | Hazmat | Potable Water Facility |
| Waterbody | Correctional Facility | Historic | Rail Station |
| Proposed Development | Dam | Hospital/Healthcare | Religious |
| 1-Percent Annual Chance Flood Event | EMS | Major Business | Senior Facility |
| 0.2-Percent Annual Chance Flood Event | EOC | Military | Waste Water Facility |
| | Education | Natural Gas Facility | |

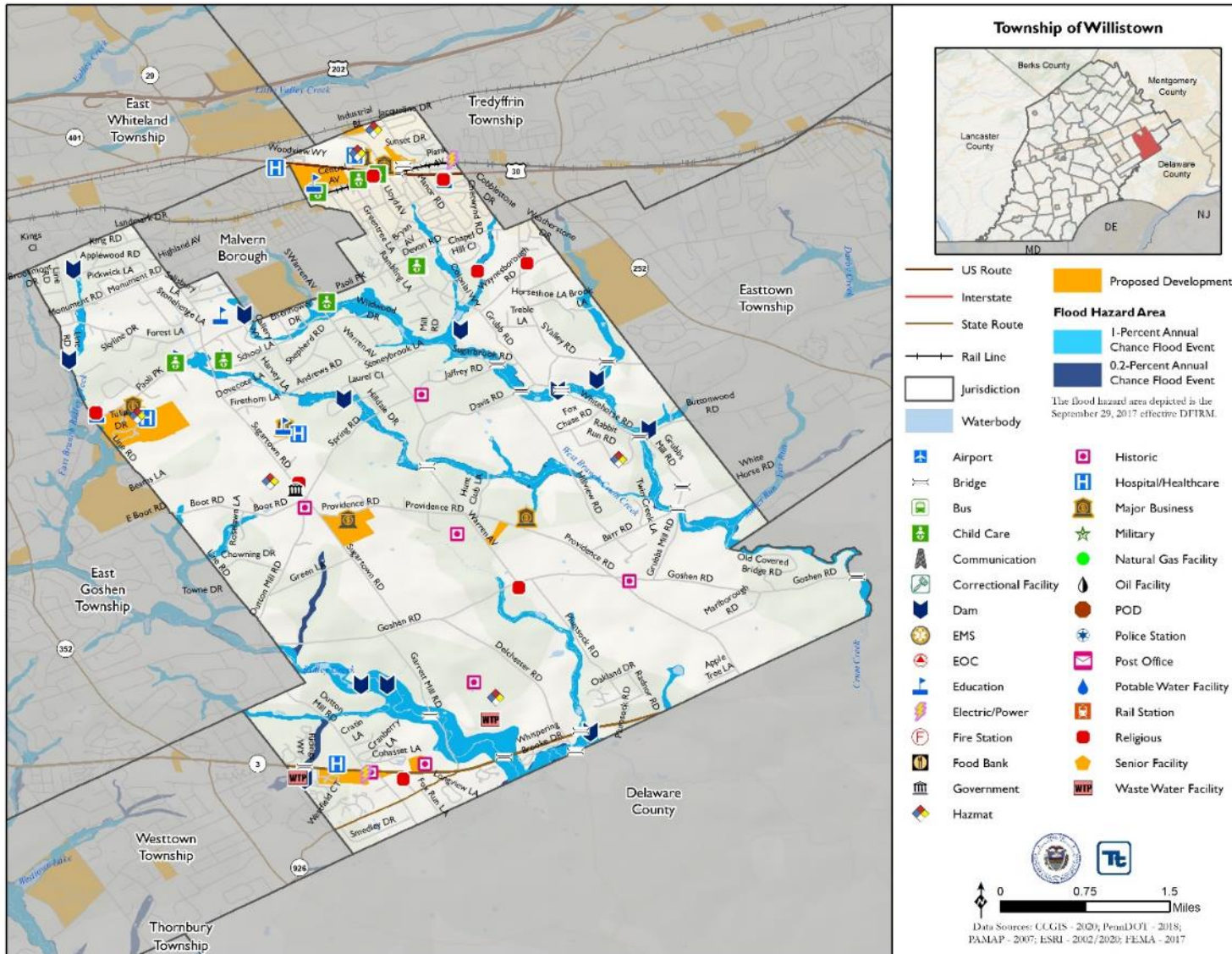
Data Sources: CCGIS - 2020; PennDOT - 2018; PAMAP - 2007; FSRI - 2002/2020; FTMA - 2017

The flood hazard area depicted is the September 29, 2017 effective DFTRM.





Willistown Township





4.3.8 Hurricane, Tropical Storm

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hurricane and tropical storm hazard in Chester County.

Hurricanes and Tropical Storm

Tropical cyclones are fueled by a different heat mechanism than other cyclonic windstorms, such as Nor'easters and polar lows. The characteristic that separates tropical storms from other cyclonic systems is that at any height in the atmosphere, the center of a tropical storm will be warmer than its surroundings, a phenomenon called *warm core* storm systems (NOAA 2013). Tropical cyclones strengthen when water evaporated from the ocean is released as the saturated air rises, resulting in condensation of water vapor contained in the moist air. Tropical cyclones begin as disturbed areas of weather, often referred to as tropical waves. As the storm organizes, it is designated as a tropical depression.

A tropical storm system is characterized by a low-pressure center and numerous thunderstorms that produce strong winds of 39 to 73 mph and heavy rain. A hurricane is a tropical storm that attains hurricane status when its wind speed reaches 74 mph or higher. Tropical systems can develop in the Atlantic between the Lesser Antilles and the African coast or in the warm tropical waters of the Caribbean Sea and Gulf of Mexico. These storms can move up the Atlantic Coast of the United States, impacting the eastern seaboard, or move into the United States through the states along the Gulf Coast, bringing wind and rain as far north as New England before moving eastward offshore.

Despite being an inland county, the impacts of hurricanes and tropical storms can impact Chester County. Hurricanes and tropical storms can impact Chester County from June to November, the official Atlantic hurricane season (NHC 2019).

4.3.8.1 Location and Extent

Chester County is not located along the Atlantic Coast, but hurricanes and tropical storms can track inland, bringing heavy rainfall, strong winds, and flooding. These storms are regional events that can impact very large areas hundreds to thousands of miles across over the life of the storm. Therefore, all communities within Chester County are equally subject to the impacts of hurricanes and tropical storms. Areas in Chester County that are subject to flooding and wind damage are particularly vulnerable.

Tropical Storm and Hurricane Tracks

NOAA's Historical Hurricane Tracks tool is a public interactive mapping application that displays Atlantic Basin and East-Central Pacific Basin tropical cyclone data. This interactive tool catalogs tropical cyclones that have occurred from 1842 to 2020 (latest date available from data source). Between 1842 and 2020, 56 events classified as either a hurricane, tropical storm, tropical depression, or extra tropical storm tracked within 65 nautical miles of Chester County. Figure 4.3.8-1 displays tropical cyclone tracks for Chester County that tracked within 65 nautical miles between 1842 and 2020. While some events are not shown on this figure, those events did not occur within 65 nautical miles of the county. However, these events could have severely impacted the county with strong winds, power outages, and other damage. The "Previous Events and Losses" section provides further information regarding hurricane and tropical storm events that impacted Chester County.

The National Weather Service (NWS) issues hurricane and tropical storm watches and warnings. These watches and warnings are issued or will remain in effect after a tropical cyclone becomes post-tropical when such a storm



poses a significant threat to life and property. The NWS allows the NHC to issue advisories during the post-tropical stage. The following are the definitions of the watches and warnings:

- A *Hurricane/Typhoon Warning* is issued when sustained winds of 74 mph or higher are expected somewhere within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm-force, the warning is issued 36 hours in advance of the anticipated onset of tropical storm-force winds. The warning can remain in effect when dangerously high water or combination of dangerously high water and waves continue, even though winds may be less than hurricane force.
- A *Hurricane Watch* is issued when sustained winds of 74 mph or higher are possible within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm-force, the hurricane watch is issued 48 hours prior to the anticipated onset of tropical storm-force winds.
- A *Tropical Storm Warning* is issued when sustained winds of 39 to 73 mph are expected somewhere within the specified area within 36 hours in association with a tropical, subtropical, or post-tropical storm.
- A *Tropical Storm Watch* is issued when sustained winds of 39 to 73 mph are possible within the specified area within 48 hours in association with a tropical, sub-tropical, or post-tropical storm (NWS 2019).



Figure 4.3.8-1. Historical Tropical Storm and Hurricane Tracks 1842 to 2020



Source: NOAA 2020

Note: Chester County is outlined in orange

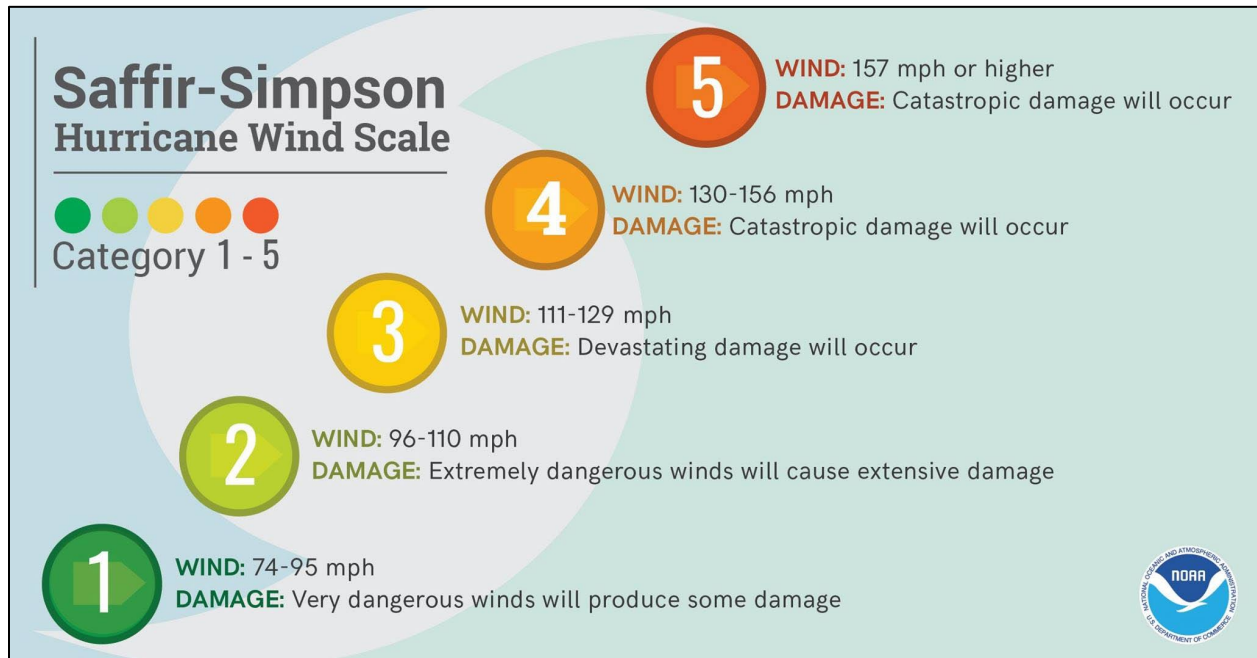




4.3.8.2 Range of Magnitude

The extent of a hurricane or tropical storm is commonly categorized in accordance with the Saffir-Simpson Hurricane Wind Scale, which assigns a designation of tropical storm for storms with sustained wind speeds below 74 mph and a hurricane category rating of 1–5 based on a hurricane’s increasing sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered *major hurricanes* because of their potential for significant loss of life and damage. Tropical Storms and Category 1 and 2 storms are still dangerous and require preventative measures (NOAA 2013). Figure 4.3.8-2 presents this scale, which is used to estimate the potential property damage and flooding expected when a hurricane makes landfall.

Figure 4.3.8-2. The Saffir-Simpson Scale



Source: Disaster Readiness Portal 2017

Mean Return Period

Peak wind speed projections were generated using Hazus. For the 100-year MRP event, the maximum 3-second wind speeds range from 56–70 miles per hour (mph), characteristic of a tropical storm. For the 500-year MRP event, the maximum 3-second gust wind speeds range from 62–91 mph, characteristic of a high-level tropical storm or Category 1 hurricane. Hazus did not generate the hurricane track for the 100- and 500-year probabilistic events. The associated impacts and losses from the 100-year and 500-year MRP hurricane event model run is reported in the vulnerability assessment. Figure 4.3.8-3 and Figure 4.3.8-4 show the estimated maximum 3-second gust wind speeds that can be anticipated in the study area associated with the 100-year and 500-year MRP events.



Figure 4.3.8-3. Wind Speeds for the 100-Year Mean Return Period Event

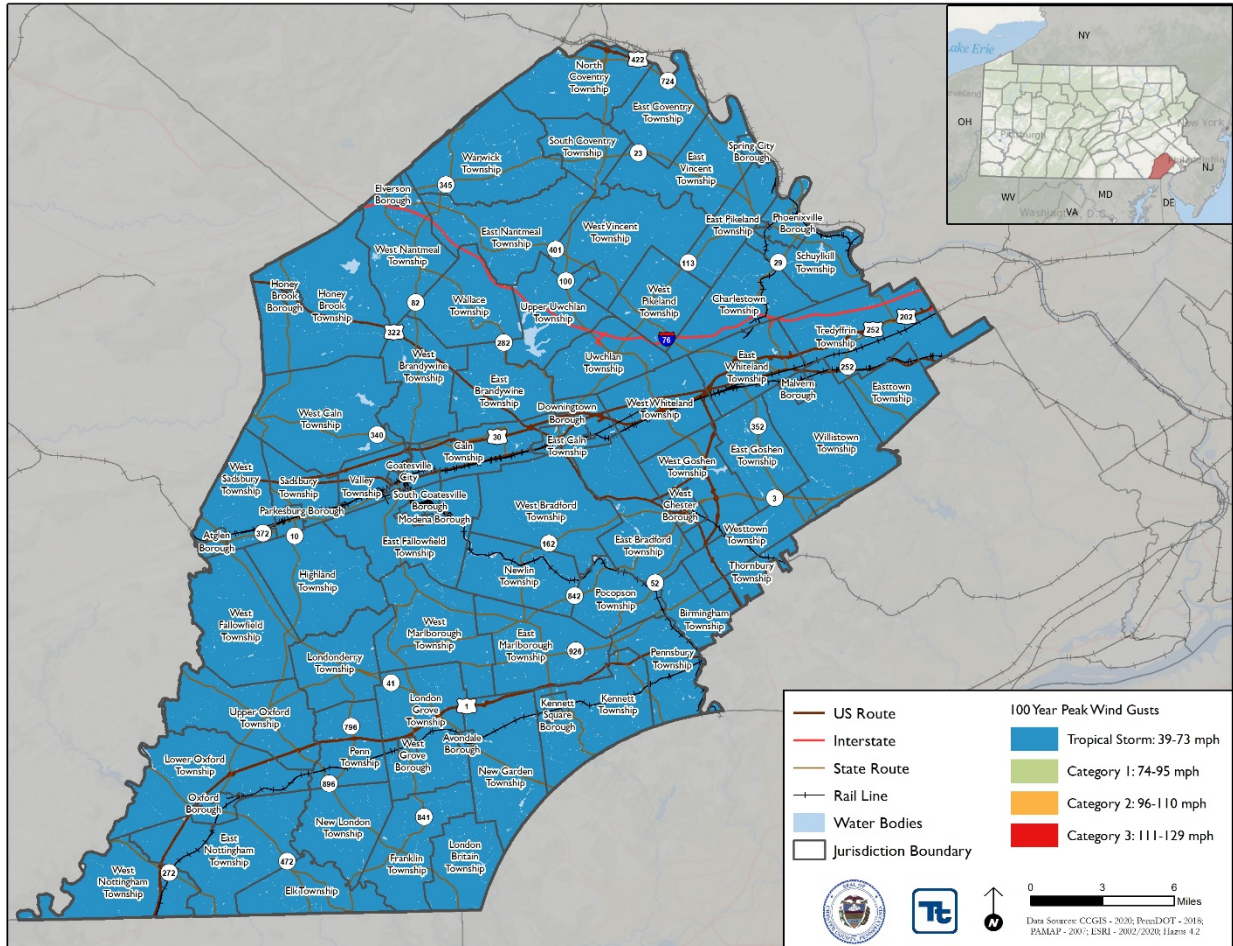
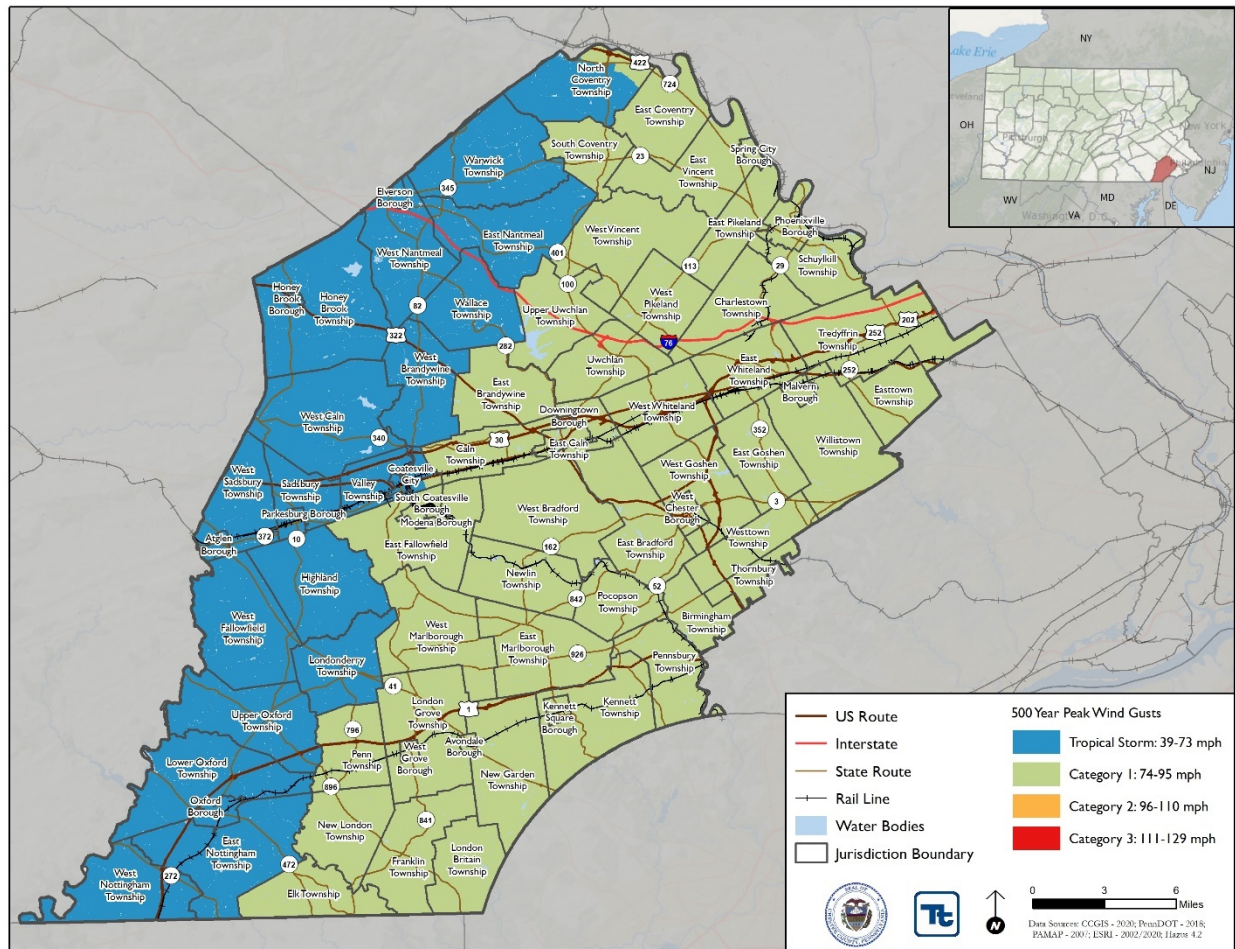




Figure 4.3.8-4. Wind Speeds for the 500-Year Mean Return Period Event



4.3.8.3 Past Occurrence

Between 1842 and 2020, 56 events classified as either a hurricane, tropical storm, tropical depression, or extra tropical storm tracked within 65 nautical miles of Chester County (NOAA 2020). Between 1954 and 2019, Pennsylvania was included in 14 Federal Emergency Management Agency (FEMA) declared hurricane/tropical storm-related major disaster declaration (DR) or emergency (EM) classified as one or a combination of the following hazards: tropical storm, hurricane, tropical depression, flash flooding, severe storms, and flooding. Of those declarations, Chester County was included in five of the declarations (FEMA 2019).

Table 4.3.8-1. Hurricane/Tropical Storm-Related FEMA Declarations for Chester County, 1954 to 2020

FEMA Declaration Number	Date(s) of Event	Event Type	Details
DR-340	June 23, 1972	Tropical Storm	Pennsylvania Tropical Storm Agnes
DR-1294	September 16–29, 1999	Hurricane	Pennsylvania Hurricane Floyd
DR-1497	September 23–26, 2003	Tropical Storm and Related Severe Storms and Flooding	Pennsylvania Tropical Storms Henri and Isabel, and Related Severe Storms and Flooding



FEMA Declaration Number	Date(s) of Event	Event Type	Details
DR-1557	September 17–October 1, 2004	Hurricane	Tropical Depression Ivan
EM-3235	August 29–October 1, 2005	Hurricane	Hurricane Katrina, the county was impacted by assisting in the evacuation and relocation of residents in impacted areas along the gulf coast
DR-4025/EM-3339	August 26–August 30, 2011	Hurricane	Hurricane Irene
EM-3340/DR-4030	September 3–October 15, 2011	Tropical Storm	Remnants of Tropical Storm Lee
EM-3356	October 26–November 8, 2012	Hurricane	Hurricane Sandy

Source: FEMA 2020

For this 2021 Hazard Mitigation Plan (HMP) update, hurricane and tropical storms events, including FEMA disaster declarations that impacted Chester County, from 1842–2020 are identified in Table 4.3.8-2. Because documentation for these types of events is so extensive, not all sources have been identified or researched. Therefore, Table 4.3.8-2 may not include all events that occurred throughout the county.



Table 4.3.8-2. Tropical Cyclone Events Impacting Chester County, PA from 1842-2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
September 22–29, 1861	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 27–28, 1861	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 31–November 03, 1861	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 11–20, 1863	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 16–19, 1863	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 23–26, 1864	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 29–30, 1866	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 10–18, 1867	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 22–28, 1872	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 25–October 1, 1874	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 21–October 5, 1877	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 18–25, 1878	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 21–24, 1882	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
June 17–24, 1886	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 14–24, 1888	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 6–13, 1888	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 15–September 2, 1893	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 20–23, 1893	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 26–November 4, 1899	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 12–17, 1903	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 8–15, 1904	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 31–August 5, 1915	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.



Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
September 27–October 1, 1924	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 19–October 5, 1929	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 13–28, 1933	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 4–21, 1934	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 1–4, 1934	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 7–19, 1939	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 28–October 2, 1943	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 30–August 4 1944	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 12–20, 1945	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 23–September 1, 1949	Hurricane Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 18–September 3, 1952	Hurricane Able	N/A	No	Losses and/or damages in Chester County were not identified for this event.
October 5–18, 1954	Hurricane Hazel	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 3–15, 1955	Hurricane Connie	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 7–23, 1955	Hurricane Diane	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 27–August 7, 1960	Tropical Storm Brenda	N/A	No	Losses and/or damages in Chester County were not identified for this event.
June 1–4, 1963	Tropical Storm Unnamed	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 20–29, 1971	Tropical Storm Doria	N/A	No	Losses and/or damages in Chester County were not identified for this event.
June 23, 1972	Hurricane Agnes	DR-340	Yes	Losses and/or damages in Chester County were not identified for this event.
August 21–30, 1988	Tropical Storm Chris	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 22–26, 1992	Tropical Storm Danielle	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 14–19, 1994	Tropical Storm Beryl	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 5–17, 1996	Hurricane Bertha	N/A	No	Losses and/or damages in Chester County were not identified for this event.
September 16–29, 1999	Hurricane Floyd	DR-1294	Yes	Losses and/or damages in Chester County were not identified for this event.



Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
September 14–21, 2000	Hurricane Gordon	N/A	No	1.67 inches of rain fell across southeastern Pennsylvania. Poor drainage especially in low-lying areas but no injuries or serious flooding was reported.
September 15–23, 2003	Tropical Storm Henri and Isabel	DR-1497	Yes	Losses and/or damages in Chester County were not identified for this event.
September 17–October 1, 2004	Hurricane Ivan	DR-1557	Yes	Losses and/or damages in Chester County were not identified for this event.
July 03-11, 2005	Hurricane Cindy	N/A	No	Losses and/or damages in Chester County were not identified for this event.
August 29–October 1, 2005	Hurricane Katrina	EM-3235	Yes	Losses and/or damages in Chester County were not identified for this event.
August 24–September 4, 2006	Hurricane Ernesto	N/A	No	2.14 inches fell across the county and strong winds caused power outages and downed trees. PECO Energy reported 50,000 customers lost power.
September 6, 2008	Tropical Storm Hanna	N/A	No	Storm totals averaged from around 2 inches to around 4 inches. In Chester County, about 5,700 homes and businesses lost power, most in heavily wooded areas.
August 26–August 30, 2011	Hurricane Irene	DR-4025 EM-3339	Yes	Preliminary damage estimates were around six million dollars. In addition to property damage, the winds and rains badly damaged the corn crop in southeastern Pennsylvania. Wind gusts of 46 mph were observed in Chester County.
September 3–October 15, 2011	Tropical Storm Lee	DR-4030 EM-3340	Yes	The remnants of Tropical Storm Lee that interacted with a stalled frontal boundary produced several days with periods of heavy rain across Eastern Pennsylvania. 4-9 inches fell in Chester County.
October 26–November 8, 2012	Hurricane Sandy	EM-3356	Yes	Post-Tropical Storm Sandy caused an initial estimate of \$20 million dollars in damage in Pennsylvania and directly or indirectly caused 15 deaths across the state. Most of the damage in the eastern part of the state was wind-related as wind gusts reached as high as 81 mph. Moderate creek flooding, road closures, power outages, and downed trees occurred, and 4-6 inches of rain fell.
September 17–18, 2018	Hurricane Florence	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 4–11, 2020	Tropical Storm Fay	N/A	No	Losses and/or damages in Chester County were not identified for this event.
July 23–August 5, 2020	Hurricane Isaias	N/A	No	Rainfall totals ranged from 5-8.5 inches. A wind gust of 65 mph was measured by a DEOS gauge at White Clay Creek in West Grove and sustained tropical storm-force winds likely occurred. A number of reports of downed trees and wires were received.

Sources: NOAA-NCEI 2020; PA HMP 2018; FEMA 2020

DR Federal Disaster Declaration

EM Emergency Management

FEMA Federal Emergency Management Agency

NCEI National Centers for Environmental Information

NOAA National Oceanic Atmospheric Administration

N/A Not applicable / not available





4.3.8.4 Future Occurrence

For the 2021 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of hurricane and tropical storms events for Chester County. Information from NOAA-NCEI storm events database and a NOAA Historical Hurricane Tracks search were used to identify the number of events between 1950 and 2020. A 65 nautical mile buffer was used to determine future occurrences. It is to be noted, that the storm was counted as the category it was when it passed over the county, not its maximum category. Using these sources ensures the most accurate probability estimates possible. The table below shows these statistics as well as the annual average number of events and the estimate percent chance of an incident occurring each year.

Table 4.3.8-3. Probability of Future Hurricane and Tropical Storm Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Recurrence Interval (in years) (# Years/Number of Events)	Percent chance of occurrence in any given year
Extra-Tropical Storms	6	11.67	8.57
Tropical Depression	1	70.00	1.43
Tropical Storm	13	5.38	18.57
Hurricanes (all categories)	0	0.00	0.00

Source: NOAA Hurricane Tracker 2020; NOAA-NCEI 2020

It is estimated that Chester County will continue to experience direct and indirect impacts of hurricanes, and tropical storms annually that can induce secondary hazards, such as flooding, extreme wind, infrastructure deterioration or failure, utility failures, power outages, water quality, and supply concerns, and transportation delays, accidents, and inconveniences. Therefore, the future occurrence of hurricanes and tropical storms in Chester County can be characterized as *possible*, as defined by the Risk Factor Methodology probability criteria, as provided in Table 4.4-1.

4.3.8.5 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable in the identified hazard area. For severe storms, the entirety of Chester County has been identified as the hazard area. Therefore, all assets in the county (population, structures, critical facilities, and lifelines), as described in the county profile, are vulnerable. Potential losses associated with high-wind events were calculated for the county for two probabilistic hurricane events: the 100-year and 500-year MRP hurricane events. The impacts on population, existing structures, critical facilities, and the economy are presented below.

Impact on Life, Health, and Safety

For the purposes of this HMP, the entire population of Chester County (517,156 people) is exposed to hurricanes and tropical storm events (U.S. Census 2018). Residents might be displaced or require temporary to long-term sheltering. In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life. Socially vulnerable populations are most susceptible based on several factors, including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Hazus estimates no households will be displaced and temporary shelter will not be required as a result of the 100-year MRP event. As a result of the 500-year MRP event, two households will be displaced, but none will require temporary shelter.

Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and might lack funds to evacuate. The population over the age of 65 is also more vulnerable and might physically have more difficulty evacuating. The



elderly are considered most vulnerable because they require extra time or outside assistance during evacuations and are more likely to seek or need medical attention that might not be available due to isolation during a storm event. Section 2 (County Profile) provides statistics of these populations.

Impact on General Building Stock

It is assumed that the entire county’s general building stock is exposed to the severe storm wind hazard (\$194.7 billion). Building construction plays a major role in the extent of damage resulting from a severe storm event. Due to differences in construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. Wood and masonry buildings, in general, regardless of their occupancy class, tend to experience more damage than concrete or steel buildings. High-rise buildings are also very vulnerable structures. Mobile homes are the most vulnerable to damage, even if tied down, and offer little protection to people inside.

The Hazus wind model was run to estimate potential losses to buildings. Expected building damage was evaluated across the following wind damage categories: no damage/very minor damage, minor damage, moderate damage, severe damage, and total destruction. Table 4.3.8-4 summarizes the definition of the damage categories.

Table 4.3.8-4. Description of Damage Categories

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
No Damage or Very Minor Damage Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof cover, with no or very limited water penetration.	≤2%	No	No	No	No	No
Minor Damage Maximum of one broken window, door, or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.	>2% and ≤15%	One window, door, or garage door failure	No	<5 impacts	No	No
Moderate Damage Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water.	>15% and ≤50%	> one and ≤ the larger of 20% & 3	1 to 3 panels	Typically 5 to 10 impacts	No	No
Severe Damage Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.	>50%	> the larger of 20% & 3 and ≤50%	>3 and ≤25%	Typically 10 to 20 impacts	No	No
Destruction Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.	Typically >50%	>50%	>25%	Typically >20 impacts	Yes	Yes

Source: HAZUS-MH Hurricane Technical Manual

Table 4.3.8-5 and Table 4.3.8-6 summarizes the building value damage estimated for the 100- and 500-year MRP wind-only events. Damage estimates are reported for the county’s probabilistic Hazus model scenarios. The data shown indicates total losses associated with wind damage to building structure and content.



The total damage to buildings for all occupancy types across Chester County is estimated to be approximately \$38.2 million and \$285.6 million for the 100- and 500-year MRP wind-only events, respectively. Most of these losses are to the residential building category. Due to differences in building construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. The damage counts include buildings damaged at all severity levels from minor damage to destruction. Total dollar damage reflects the overall impact to buildings at an aggregate level. The Township of Tredyffrin would experience the greatest damage, losing approximately \$3 million in a 100-year MRP event and \$29 million in a 500-year MRP event.



Table 4.3.8-5. Estimated Building Value Damaged by the 500-Year MRP Hurricane-Related Winds

Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages*		Percent of Total Building and Contents RCV	
		100-Year	500-Year	100-Year	500-Year
Atglen (B)	\$300,171,233	\$3,549	\$20,027	<0.1%	<0.1%
Avondale (B)	\$275,491,131	\$10,053	\$118,349	<0.1%	<0.1%
Birmingham (Twp.)	\$1,521,752,088	\$468,534	\$4,303,928	<0.1%	0.3%
Caln (Twp.)	\$4,389,258,174	\$436,961	\$2,914,931	<0.1%	0.1%
Charlestown (Twp.)	\$2,334,124,537	\$499,350	\$4,068,729	<0.1%	0.2%
Coatesville (C)	\$2,658,702,748	\$152,454	\$1,005,478	<0.1%	<0.1%
Downingtown (B)	\$2,678,308,815	\$469,472	\$2,617,823	<0.1%	0.1%
East Bradford (Twp.)	\$3,166,888,223	\$1,342,794	\$9,150,588	<0.1%	0.3%
East Brandywine (Twp.)	\$2,499,920,165	\$551,219	\$2,705,663	<0.1%	0.1%
East Caln (Twp.)	\$1,864,909,402	\$237,261	\$1,688,533	<0.1%	0.1%
East Coventry (Twp.)	\$2,200,926,728	\$767,815	\$2,849,864	<0.1%	0.1%
East Fallowfield (Twp.)	\$1,984,687,476	\$305,579	\$1,696,159	<0.1%	0.1%
East Goshen (Twp.)	\$5,680,635,001	\$3,972,742	\$24,781,492	<0.1%	0.4%
East Marlborough (Twp.)	\$3,646,563,821	\$665,597	\$6,001,625	<0.1%	0.2%
East Nantmeal (Twp.)	\$1,131,945,456	\$117,223	\$375,582	<0.1%	<0.1%
East Nottingham (Twp.)	\$3,185,167,607	\$174,470	\$1,839,116	<0.1%	0.1%
East Pikeland (Twp.)	\$2,751,413,608	\$721,958	\$4,084,783	<0.1%	0.1%
East Vincent (Twp.)	\$2,764,012,516	\$830,559	\$3,798,120	<0.1%	0.1%
East Whiteland (Twp.)	\$8,143,686,632	\$932,179	\$8,921,183	<0.1%	0.1%
Easttown (Twp.)	\$3,998,338,009	\$1,391,713	\$12,266,081	<0.1%	0.3%
Elk (Twp.)	\$754,193,647	\$56,722	\$725,125	<0.1%	0.1%
Elverson (B)	\$516,332,051	\$11,510	\$28,395	<0.1%	<0.1%
Franklin (Twp.)	\$1,537,535,450	\$226,015	\$2,614,321	<0.1%	0.2%



Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages*		Percent of Total Building and Contents RCV	
		100-Year	500-Year	100-Year	500-Year
Highland (Twp.)	\$1,067,555,265	\$60,138	\$281,942	<0.1%	<0.1%
Honey Brook (B)	\$446,825,932	\$30,405	\$70,693	<0.1%	<0.1%
Honey Brook (Twp.)	\$3,389,705,910	\$197,187	\$426,659	<0.1%	<0.1%
Kennett (Twp.)	\$4,134,894,338	\$688,480	\$10,463,511	<0.1%	0.3%
Kennett Square (B)	\$1,600,982,472	\$398,038	\$3,128,174	<0.1%	0.2%
London Britain (Twp.)	\$1,064,040,035	\$183,986	\$2,252,511	<0.1%	0.2%
London Grove (Twp.)	\$3,148,102,405	\$350,270	\$4,123,567	<0.1%	0.1%
Londonderry (Twp.)	\$1,034,199,367	\$120,788	\$812,784	<0.1%	0.1%
Lower Oxford (Twp.)	\$2,325,017,464	\$51,888	\$724,190	<0.1%	<0.1%
Malvern (B)	\$1,256,307,741	\$227,343	\$2,328,585	<0.1%	0.2%
Modena (B)	\$143,886,459	\$4,891	\$42,350	<0.1%	<0.1%
New Garden (Twp.)	\$5,996,313,471	\$739,432	\$11,531,650	<0.1%	0.2%
New London (Twp.)	\$1,850,994,293	\$173,939	\$2,194,368	<0.1%	0.1%
Newlin (Twp.)	\$767,919,221	\$71,334	\$624,811	<0.1%	0.1%
North Coventry (Twp.)	\$2,814,129,243	\$710,580	\$2,096,268	<0.1%	0.1%
Oxford (B)	\$1,620,222,123	\$36,210	\$452,147	<0.1%	<0.1%
Parkesburg (B)	\$791,790,495	\$57,155	\$221,906	<0.1%	<0.1%
Penn (Twp.)	\$3,335,917,017	\$143,062	\$2,197,351	<0.1%	0.1%
Pennsbury (Twp.)	\$1,741,030,601	\$355,947	\$4,629,290	<0.1%	0.3%
Phoenixville (B)	\$4,404,373,172	\$1,379,518	\$6,847,172	<0.1%	0.2%
Pocopson (Twp.)	\$1,616,048,060	\$361,974	\$3,289,006	<0.1%	0.2%
Sadsbury (Twp.)	\$1,514,078,865	\$98,284	\$433,989	<0.1%	<0.1%
Schuylkill (Twp.)	\$3,296,773,180	\$1,512,984	\$8,384,114	<0.1%	0.3%
South Coatesville (B)	\$656,482,254	\$24,327	\$210,638	<0.1%	<0.1%
South Coventry (Twp.)	\$1,175,837,157	\$222,545	\$707,392	<0.1%	0.1%



Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages*		Percent of Total Building and Contents RCV	
		100-Year	500-Year	100-Year	500-Year
Spring City (B)	\$913,935,869	\$388,777	\$1,641,877	<0.1%	0.2%
Thornbury (Twp.)	\$1,249,939,720	\$308,921	\$2,676,845	<0.1%	0.2%
Tredyffrin (Twp.)	\$13,427,976,905	\$3,141,919	\$29,140,527	<0.1%	0.2%
Upper Oxford (Twp.)	\$1,327,197,078	\$87,448	\$638,131	<0.1%	<0.1%
Upper Uwchlan (Twp.)	\$3,757,709,779	\$762,098	\$3,780,461	<0.1%	0.1%
Uwchlan (Twp.)	\$7,025,589,763	\$1,073,364	\$7,870,665	<0.1%	0.1%
Valley (Twp.)	\$2,597,377,442	\$168,111	\$920,186	<0.1%	<0.1%
Wallace (Twp.)	\$1,322,743,721	\$203,202	\$720,228	<0.1%	0.1%
Warwick (Twp.)	\$1,133,542,100	\$143,707	\$325,698	<0.1%	<0.1%
West Bradford (Twp.)	\$3,995,074,181	\$697,353	\$5,380,944	<0.1%	0.1%
West Brandywine (Twp.)	\$2,231,906,820	\$291,703	\$1,305,716	<0.1%	0.1%
West Caln (Twp.)	\$2,765,167,902	\$198,378	\$958,856	<0.1%	<0.1%
West Chester (B)	\$5,374,643,016	\$839,181	\$6,663,403	<0.1%	0.1%
West Fallowfield (Twp.)	\$1,743,066,295	\$102,779	\$430,035	<0.1%	<0.1%
West Goshen (Twp.)	\$9,444,801,871	\$1,626,466	\$13,569,503	<0.1%	0.1%
West Grove (B)	\$499,625,186	\$66,116	\$663,338	<0.1%	0.1%
West Marlborough (Twp.)	\$997,081,475	\$100,514	\$880,395	<0.1%	0.1%
West Nantmeal (Twp.)	\$1,139,858,316	\$151,520	\$373,803	<0.1%	<0.1%
West Nottingham (Twp.)	\$1,196,217,005	\$32,471	\$318,760	<0.1%	<0.1%
West Pikeland (Twp.)	\$1,506,034,830	\$405,909	\$2,712,400	<0.1%	0.2%
West Sadsbury (Twp.)	\$1,651,357,888	\$42,605	\$240,407	<0.1%	<0.1%
West Vincent (Twp.)	\$2,587,356,437	\$591,003	\$2,674,953	<0.1%	0.1%
West Whiteland (Twp.)	\$7,660,221,171	\$1,113,265	\$9,405,719	<0.1%	0.1%
Westtown (Twp.)	\$3,282,102,771	\$1,668,735	\$10,922,377	0.1%	0.3%
Willistown (Twp.)	\$4,727,817,226	\$1,447,840	\$14,378,069	<0.1%	0.3%



Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages*		Percent of Total Building and Contents RCV	
		100-Year	500-Year	100-Year	500-Year
Chester County (Total)	\$194,736,735,824	\$38,199,820	\$285,644,260	<0.1%	0.1%

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: B – Borough; C – City; Twp. – Township; % - Percent

*The Total Damages column represents the sum of damages for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government) based on improvement value.

Table 4.3.8-6. Estimated Residential, Commercial, and Other Building Value Damaged by the 100-Year and 500-Year MRP Hurricane-Related Winds

Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Residential Damages		Estimated Commercial Damages		Estimated Damages for All Other Occupancies	
		100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Atglen (B)	\$300,171,233	\$3,549	\$17,126	\$0	\$2,485	\$0	\$416
Avondale (B)	\$275,491,131	\$10,053	\$99,569	\$0	\$1,524	\$0	\$17,257
Birmingham (Twp.)	\$1,521,752,088	\$455,779	\$3,935,889	\$11,102	\$64,119	\$1,653	\$303,920
Caln (Twp.)	\$4,389,258,174	\$400,942	\$2,682,613	\$25,088	\$125,560	\$10,930	\$106,758
Charlestown (Twp.)	\$2,334,124,537	\$469,253	\$3,562,296	\$19,225	\$117,884	\$10,873	\$388,549
Coatesville (C)	\$2,658,702,748	\$152,454	\$921,302	\$0	\$33,268	\$0	\$50,908
Downingtown (B)	\$2,678,308,815	\$391,690	\$2,376,709	\$30,787	\$84,438	\$46,994	\$156,676
East Bradford (Twp.)	\$3,166,888,223	\$1,308,977	\$8,823,238	\$11,771	\$55,480	\$22,047	\$271,870
East Brandywine (Twp.)	\$2,499,920,165	\$536,498	\$2,639,761	\$7,058	\$14,545	\$7,663	\$51,357
East Caln (Twp.)	\$1,864,909,402	\$193,094	\$1,571,204	\$31,795	\$91,863	\$12,372	\$25,467
East Coventry (Twp.)	\$2,200,926,728	\$742,698	\$2,630,630	\$15,691	\$34,050	\$9,425	\$185,183
East Fallowfield (Twp.)	\$1,984,687,476	\$305,579	\$1,642,159	\$0	\$9,061	\$0	\$44,940
East Goshen (Twp.)	\$5,680,635,001	\$3,899,919	\$23,992,119	\$53,269	\$447,562	\$19,554	\$341,811
East Marlborough (Twp.)	\$3,646,563,821	\$598,879	\$5,217,842	\$35,395	\$180,037	\$31,324	\$603,745
East Nantmeal (Twp.)	\$1,131,945,456	\$103,291	\$345,187	\$5,933	\$5,933	\$7,998	\$24,462
East Nottingham (Twp.)	\$3,185,167,607	\$174,470	\$1,706,378	\$0	\$11,666	\$0	\$121,072
East Pikeland (Twp.)	\$2,751,413,608	\$689,994	\$3,690,081	\$21,997	\$74,483	\$9,967	\$320,219
East Vincent (Twp.)	\$2,764,012,516	\$787,351	\$3,324,241	\$18,120	\$76,113	\$25,087	\$397,767



Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Residential Damages		Estimated Commercial Damages		Estimated Damages for All Other Occupancies	
		100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
East Whiteland (Twp.)	\$8,143,686,632	\$646,961	\$6,182,148	\$228,158	\$2,276,707	\$57,059	\$462,329
Easttown (Twp.)	\$3,998,338,009	\$1,341,561	\$11,494,039	\$28,363	\$313,501	\$21,789	\$458,541
Elk (Twp.)	\$754,193,647	\$56,722	\$611,878	\$0	\$1,138	\$0	\$112,109
Elverson (B)	\$516,332,051	\$11,510	\$26,907	\$0	\$498	\$0	\$990
Franklin (Twp.)	\$1,537,535,450	\$226,015	\$2,396,750	\$0	\$16,405	\$0	\$201,166
Highland (Twp.)	\$1,067,555,265	\$60,138	\$243,802	\$0	\$876	\$0	\$37,264
Honey Brook (B)	\$446,825,932	\$30,405	\$64,122	\$0	\$4,608	\$0	\$1,963
Honey Brook (Twp.)	\$3,389,705,910	\$197,187	\$389,033	\$0	\$20,847	\$0	\$16,779
Kennett (Twp.)	\$4,134,894,338	\$647,714	\$7,615,606	\$22,054	\$165,345	\$18,711	\$2,682,560
Kennett Square (B)	\$1,600,982,472	\$357,413	\$2,895,768	\$24,439	\$136,796	\$16,185	\$95,610
London Britain (Twp.)	\$1,064,040,035	\$180,876	\$2,145,962	\$1,104	\$4,232	\$2,005	\$102,317
London Grove (Twp.)	\$3,148,102,405	\$350,270	\$3,469,213	\$0	\$53,095	\$0	\$601,259
Londonderry (Twp.)	\$1,034,199,367	\$120,788	\$732,535	\$0	\$4,665	\$0	\$75,584
Lower Oxford (Twp.)	\$2,325,017,464	\$51,888	\$644,813	\$0	\$15,361	\$0	\$64,015
Malvern (B)	\$1,256,307,741	\$201,948	\$2,164,023	\$12,662	\$96,872	\$12,733	\$67,690
Modena (B)	\$143,886,459	\$4,891	\$34,285	\$0	\$2,372	\$0	\$5,693
New Garden (Twp.)	\$5,996,313,471	\$657,277	\$7,309,232	\$47,294	\$196,428	\$34,862	\$4,025,990
New London (Twp.)	\$1,850,994,293	\$173,939	\$2,046,829	\$0	\$11,872	\$0	\$135,666
Newlin (Twp.)	\$767,919,221	\$67,614	\$417,889	\$2,398	\$6,402	\$1,322	\$200,521
North Coventry (Twp.)	\$2,814,129,243	\$668,652	\$1,984,330	\$29,737	\$60,017	\$12,192	\$51,921
Oxford (B)	\$1,620,222,123	\$36,210	\$410,638	\$0	\$25,211	\$0	\$16,298
Parkesburg (B)	\$791,790,495	\$57,155	\$209,037	\$0	\$8,367	\$0	\$4,503
Penn (Twp.)	\$3,335,917,017	\$143,062	\$1,631,832	\$0	\$68,817	\$0	\$496,702
Pennsbury (Twp.)	\$1,741,030,601	\$343,964	\$3,792,980	\$8,242	\$90,106	\$3,741	\$746,203
Phoenixville (B)	\$4,404,373,172	\$1,295,766	\$6,373,171	\$51,023	\$228,410	\$32,729	\$245,591
Pocopson (Twp.)	\$1,616,048,060	\$341,236	\$2,869,257	\$11,590	\$56,227	\$9,148	\$363,521
Sadsbury (Twp.)	\$1,514,078,865	\$98,284	\$396,649	\$0	\$23,904	\$0	\$13,436
Schuylkill (Twp.)	\$3,296,773,180	\$1,456,999	\$7,944,095	\$19,437	\$125,461	\$36,548	\$314,558
South Coatesville (B)	\$656,482,254	\$24,327	\$170,524	\$0	\$11,799	\$0	\$28,314
South Coventry (Twp.)	\$1,175,837,157	\$200,404	\$646,284	\$6,119	\$13,255	\$16,022	\$47,853
Spring City (B)	\$913,935,869	\$368,094	\$1,497,984	\$10,844	\$36,702	\$9,840	\$107,191



Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Residential Damages		Estimated Commercial Damages		Estimated Damages for All Other Occupancies	
		100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Thornbury (Twp.)	\$1,249,939,720	\$289,608	\$2,448,622	\$6,351	\$35,598	\$12,962	\$192,626
Tredyffrin (Twp.)	\$13,427,976,905	\$2,804,572	\$24,533,244	\$265,372	\$3,681,288	\$71,975	\$925,995
Upper Oxford (Twp.)	\$1,327,197,078	\$83,151	\$540,355	\$3,025	\$3,073	\$1,272	\$94,703
Upper Uwchlan (Twp.)	\$3,757,709,779	\$712,618	\$3,628,710	\$39,727	\$115,624	\$9,753	\$36,127
Uwchlan (Twp.)	\$7,025,589,763	\$924,195	\$7,188,986	\$105,721	\$526,299	\$43,448	\$155,380
Valley (Twp.)	\$2,597,377,442	\$168,111	\$849,326	\$0	\$27,564	\$0	\$43,296
Wallace (Twp.)	\$1,322,743,721	\$191,183	\$702,828	\$1,284	\$1,284	\$10,735	\$16,115
Warwick (Twp.)	\$1,133,542,100	\$135,016	\$317,007	\$4,150	\$4,150	\$4,542	\$4,542
West Bradford (Twp.)	\$3,995,074,181	\$654,513	\$5,087,115	\$32,201	\$167,285	\$10,639	\$126,544
West Brandywine (Twp.)	\$2,231,906,820	\$291,703	\$1,253,132	\$0	\$10,084	\$0	\$42,501
West Caln (Twp.)	\$2,765,167,902	\$198,378	\$924,824	\$0	\$11,008	\$0	\$23,024
West Chester (B)	\$5,374,643,016	\$679,509	\$5,787,849	\$83,737	\$566,827	\$75,934	\$308,726
West Fallowfield (Twp.)	\$1,743,066,295	\$82,901	\$373,784	\$12,277	\$12,277	\$7,602	\$43,975
West Goshen (Twp.)	\$9,444,801,871	\$1,381,328	\$12,036,637	\$160,822	\$1,104,117	\$84,316	\$428,750
West Grove (B)	\$499,625,186	\$66,116	\$642,904	\$0	\$13,714	\$0	\$6,721
West Marlborough (Twp.)	\$997,081,475	\$95,273	\$588,830	\$3,379	\$9,020	\$1,863	\$282,545
West Nantmeal (Twp.)	\$1,139,858,316	\$151,520	\$354,207	\$0	\$6,562	\$0	\$13,034
West Nottingham (Twp.)	\$1,196,217,005	\$32,471	\$283,960	\$0	\$8,128	\$0	\$26,672
West Pikeland (Twp.)	\$1,506,034,830	\$398,023	\$2,550,431	\$2,732	\$7,766	\$5,154	\$154,203
West Sadsbury (Twp.)	\$1,651,357,888	\$42,605	\$205,574	\$0	\$29,834	\$0	\$4,999
West Vincent (Twp.)	\$2,587,356,437	\$573,751	\$2,513,225	\$8,140	\$21,275	\$9,113	\$140,452
West Whiteland (Twp.)	\$7,660,221,171	\$918,868	\$8,476,977	\$143,237	\$737,530	\$51,160	\$191,212
Westtown (Twp.)	\$3,282,102,771	\$1,615,520	\$10,342,639	\$16,356	\$154,167	\$36,860	\$425,571
Willistown (Twp.)	\$4,727,817,226	\$1,362,749	\$11,183,829	\$36,789	\$483,596	\$48,303	\$2,710,644
Chester County (Total)	\$194,736,735,824	\$35,497,421	\$250,804,954	\$1,715,994	\$13,244,436	\$986,405	\$21,594,870

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: B – Borough; C – City; Twp. – Township; % – Percent





Impact on Critical Facilities

Utility infrastructure could suffer damage from high winds associated with falling tree limbs or other debris, resulting in the loss of power. Loss of service can impact residents and business operations alike. Interruptions in heating or cooling utilities can affect populations such as the young and elderly, who are particularly vulnerable to temperature-related health impacts. Loss of power can impact other public utilities, including potable water, wastewater treatment, and communications. In addition to public water services, property owners with private wells might not have access to potable water due to pump failure until power is restored. Lack of power to emergency facilities, including police, fire, EMS, and hospitals, will inhibit a community’s ability to effectively respond to an event and maintain the safety of its citizens.

Overall, all critical facilities are exposed to the wind hazard. Hazus estimates the probability that critical facilities (i.e., medical facilities, fire/EMS, police, EOC, schools, and user-defined facilities such as shelters and municipal buildings) could sustain damage as a result of 100-year and 500-year MRP wind events. Additionally, Hazus estimates the loss of use for each facility in number of days. Due to the sensitive nature of the critical facility dataset, individual facility estimated loss is not provided.

Table 4.3.8-7 and Table 4.3.8-8 summarizes the percent probability that each facility type may experience damage as a result of the 100- and 500-year MRP events.

Table 4.3.8-7. Estimated Impacts to Critical Facilities for the 100-Year Mean Return Period Hurricane-Related Winds

Facility Type	100-Year Event				
	Loss of Days	Percent-Probability of Sustaining Damage			
		Minor	Moderate	Severe	Complete
EOC	0	0.0%–1.0%	0.0%	0.0%	0.0%
Medical	0	0.0%	0.0%	0.0%	0.0%
Police	0	0.0%–1.0%	0.0%	0.0%	0.0%
Fire	0	0.0%	0.0%	0.0%	0.0%
Schools	0	0.0%	0.0%	0.0%	0.0%

Source: HAZUS-MH v4.2; Chester County GIS 2020

Table 4.3.8-8 Estimated Impacts to Critical Facilities for the 500-Year Mean Return Period Hurricane-Related Winds

Facility Type	500-Year Event				
	Loss of Days	Percent-Probability of Sustaining Damage			
		Minor	Moderate	Severe	Complete
EOC	0	0.0%–4.0%	0.0%	0.0%	0.0%
Medical	0	0.0%–2.0%	0.0%	0.0%	0.0%
Police	0	0.0%–4.0%	0.0%	0.0%	0.0%
Fire	0	0.0%–2.0%	0.0%	0.0%	0.0%
Schools	0	0.0%–4.0%	0.0%–1.0%	0.0%	0.0%

Source: HAZUS-MH v4.2; Chester County GIS 2020



Impact on Economy

Hurricanes and tropical storms also impact the economy, including loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings. Hazus estimates the total economic loss associated with each storm scenario (direct building losses and business interruption losses). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the “Impact on General Building Stock” subsection discussed earlier. Business interruption losses are the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event. Refer to Table 4.3.8-9 for a summary of Hazus estimated economic losses for Chester County caused by the 100-year and the 500-year MRP hurricane wind events.

Table 4.3.8-9 Estimated Economic Losses for the 100-Year and 500-Year Mean Return Period Hurricane Wind Events

Mean Return Period (MRP)	Inventory Loss	Relocation Loss	Building and Content Losses	Wages Losses	Rental Losses	Income Losses
100-year MRP	\$0	\$18,740	\$38,199,820	\$0	\$13,750	\$0
500-year MRP	\$480,390	\$9,462,710	\$285,644,260	\$318,520	\$3,122,650	\$733,140

Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and heating or cooling provisions to the population.

Debris management can be costly and impact the local economy. Hazus estimates the amount of debris that might be produced as result of the 100- and 500-year MRP wind events. Table 4.3.8-10 summarizes the estimated debris by municipality, which should be considered a lower-bound analysis. Because the estimated debris production does not include debris generated by flooding, this is likely a conservative estimate and could be higher if multiple impacts occur.

Table 4.3.8-10. Debris Production for 100- and 500-Year Mean Return Period Hurricane-Related Winds

Jurisdiction	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Atglen (B)	0	1	0	0	28	28	284	284
Avondale (B)	0	10	0	0	16	127	158	1,267
Birmingham (Twp.)	13	351	0	0	206	1,851	2,057	18,510
Caln (Twp.)	15	234	0	0	146	716	1,457	7,160
Charlestown (Twp.)	2	308	0	0	0	1,602	0	16,024
Coatesville (C)	0	89	0	0	36	192	361	1,916
Downingtown (B)	13	176	0	0	213	684	2,134	6,843
East Bradford (Twp.)	26	481	0	0	371	3,166	3,709	31,656
East Brandywine (Twp.)	23	188	0	0	360	720	3,600	7,200
East Caln (Twp.)	3	137	0	0	118	589	1,177	5,886
East Coventry (Twp.)	19	213	0	0	349	1,745	3,490	17,450



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Jurisdiction	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
East Fallowfield (Twp.)	0	115	0	0	0	999	0	9,989
East Goshen (Twp.)	107	1,307	0	0	1,138	4,643	11,384	46,432
East Marlborough (Twp.)	26	471	0	0	497	4,188	4,972	41,879
East Nantmeal (Twp.)	10	27	0	0	0	0	0	0
East Nottingham (Twp.)	0	116	0	0	644	2,476	6,443	24,768
East Pikeland (Twp.)	25	325	0	0	284	1,707	2,845	17,069
East Vincent (Twp.)	22	303	0	0	437	3,493	4,366	34,930
East Whiteland (Twp.)	38	1,047	0	0	272	4,016	2,721	40,162
Easttown (Twp.)	82	1,196	0	0	79	2,089	793	20,890
Elk (Twp.)	0	56	0	0	0	972	0	9,716
Elverson (B)	0	1	0	0	0	33	0	329
Franklin (Twp.)	0	188	0	0	420	2,102	4,204	21,018
Highland (Twp.)	0	22	0	0	550	1,649	5,497	16,491
Honey Brook (B)	0	4	0	0	0	15	0	154
Honey Brook (Twp.)	1	32	0	0	805	805	8,052	8,052
Kennett (Twp.)	41	857	0	0	190	3,772	1,900	37,716
Kennett Square (B)	11	213	0	0	103	454	1,028	4,542
London Britain (Twp.)	0	157	0	0	0	1,252	0	12,521
London Grove (Twp.)	1	346	0	0	552	4,415	5,520	44,157
Londonderry (Twp.)	0	63	0	0	363	1,090	3,633	10,900
Lower Oxford (Twp.)	0	49	0	0	592	1,185	5,925	11,850
Malvern (B)	17	242	0	0	41	365	405	3,646
Modena (B)	0	5	0	0	0	11	0	113
New Garden (Twp.)	57	910	0	0	521	4,499	5,208	44,985
New London (Twp.)	0	149	0	0	376	1,502	3,755	15,021
Newlin (Twp.)	8	55	0	0	388	1,551	3,877	15,508
North Coventry (Twp.)	26	129	0	0	226	809	2,261	8,090
Oxford (B)	1	44	0	0	63	252	630	2,519
Parkesburg (B)	0	22	0	0	41	82	408	815
Penn (Twp.)	1	205	0	0	309	1,852	3,087	18,521
Pennsbury (Twp.)	1	394	0	0	0	2,252	0	22,515
Phoenixville (B)	116	548	0	0	332	1,146	3,323	11,467
Pocopson (Twp.)	14	239	0	0	266	1,598	2,663	15,977
Sadsbury (Twp.)	0	38	0	0	198	396	1,982	3,964
Schuylkill (Twp.)	57	500	0	0	589	2,130	5,884	21,297
South Coatesville (B)	0	23	0	0	0	57	0	564
South Coventry (Twp.)	8	51	0	0	0	243	0	2,430
Spring City (B)	24	105	0	0	105	289	1,050	2,888



Jurisdiction	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Thornbury (Twp.)	10	230	0	0	124	989	1,236	9,889
Tredyffrin (Twp.)	247	2,920	0	2	538	5,653	5,393	56,530
Upper Oxford (Twp.)	6	48	0	0	535	1,606	5,353	16,058
Upper Uwchlan (Twp.)	28	239	0	0	374	1,289	3,741	12,891
Uwchlan (Twp.)	49	638	0	0	239	1,608	2,390	16,071
Valley (Twp.)	0	84	0	0	0	194	0	1,942
Wallace (Twp.)	0	23	0	0	0	0	0	0
Warwick (Twp.)	0	13	0	0	0	0	0	0
West Bradford (Twp.)	13	344	0	0	302	1,491	3,021	14,917
West Brandywine (Twp.)	0	90	0	0	0	571	0	5,706
West Caln (Twp.)	0	43	0	0	0	385	0	3,850
West Chester (B)	46	682	0	0	104	650	1,048	6,491
West Fallowfield (Twp.)	7	39	0	0	584	1,168	5,838	11,677
West Goshen (Twp.)	62	1,259	0	0	384	3,444	3,839	34,425
West Grove (B)	1	51	0	0	21	167	208	1,666
West Marlborough (Twp.)	12	77	0	0	546	2,185	5,463	21,852
West Nantmeal (Twp.)	0	13	0	0	0	432	0	4,325
West Nottingham (Twp.)	0	31	0	0	0	447	0	4,472
West Pikeland (Twp.)	14	196	0	0	0	956	0	9,557
West Sadsbury (Twp.)	1	15	0	0	341	341	3,406	3,406
West Vincent (Twp.)	25	214	0	0	0	1,141	0	11,413
West Whiteland (Twp.)	41	854	0	0	242	2,786	2,416	27,864
Westtown (Twp.)	53	610	0	0	661	3,127	6,610	31,262
Willistown (Twp.)	118	1,281	0	7	584	5,081	5,844	50,802
Chester County (Total)	1,541	22,736	0	9	17,803	107,520	178,050	1,075,148

Source: HAZUS-MH 4.2; Chester County GIS 2020

Notes: B – Borough; C – City; Twp. – Township; % – Percent

Impact on the Environment

Severe wind from a tropical storm can escalate the impacts of flooding and severe winter weather. A severe storm may carry extreme rainfall that could exacerbate flooding and could increase the intensity of snow and blizzard events. More information about flooding and severe winter storm can be found in Section 4.3.7 and Section 4.3.19, respectively.

The impacts of hurricane-related windstorms on the environment typically take place over a larger area. Where these events occur, widespread, severe damage to plant species is likely. This includes uprooting or destruction of trees and an increased threat of wildfire in areas where dead trees are not removed (PEMA 2018). Section 4.3.16 (Tornado, Windstorm) provides additional environmental impacts due to wind, and Section 4.3.7 (Flood, Flash Flood, and Ice Jam) provides additional environmental impacts due to flooding from heavy rainfalls.



Future Changes that May Impact Vulnerability

Understanding future changes that affect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Understanding future changes that impact vulnerability in Chester County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. It is anticipated that any new development and new residents will be exposed to the hurricane and tropical storm hazard. However, due to increased standards and codes, new development might be less vulnerable to wind-related hazards compared to the aging building stock. The tables and hazard maps included in the jurisdictional annexes contain additional information regarding the specific areas of development that would increase county vulnerability to a wind event.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicates that Chester County’s population will continue to increase into 2040, increasing total population to approximately 603,068 persons (The Center of Rural Pennsylvania 2013). With the rise in population, additional persons will be exposed to a hurricane or other wind event.

Effect of Climate Change on Vulnerability

Since the 1970s, globally there has been an increase in ‘tropical cyclone destructiveness’ as measured by the Power Dissipation Index. This increased tropical cyclone intensity and duration correlates with increased sea surface temperature. This suggests that future increases of tropical sea surface temperature might lead to future increases in tropical cyclone intensity and duration. However, there is a high level of uncertainty regarding the relationship between climate change and storm events. Future improvements in modeling smaller scale climatic processes can be expected and will lead to improved understanding of how the changing climate will alter temperature, precipitation, and storm events in Pennsylvania (Shortle et al. 2009).

The northeast region of the United States has experienced a greater increase in extreme precipitation than any other region in the U.S. between 1958 and 2010, the northeast region experienced more than 70% increase in the amount of precipitation falling in rain events (NCA, 2014). Refer to Section 4.3.7 (Flood) for a discussion related to the impact of climate change due to increases in rainfall. An increase in storms will produce more wind events and may increase tornado activity. Additionally, thunderstorms and increase in temperature can relate to the strength of a storm resulting in tornadoes (NOAA, 2020). With an increased likelihood of strong winds and tornado events, all the county’s assets will experience additional risk for losses as a result of extreme wind events.

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014–2018 American Community Survey Population Estimates. The general building stock was also updated using RS Means 2019 building valuations that estimated replacement cost value for each building in the inventory, updated building footprints, and critical facilities were provided and reviewed by Chester County. The updated building stock



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inventory was imported into Hazus to complete a hurricane wind analysis for the 100-year and 500-year MRP hurricane wind event. Over time, Chester County may obtain additional data to support the analysis of this hazard. Data that will support the analysis would include additional detail on past hazard events and impacts, building footprints, and specific building information, such as details on protective features (e.g., hurricane straps).



4.3.9 Invasive Species

This section provides a profile and vulnerability assessment for the invasive species hazard. An invasive species is a group of living organisms that is not indigenous to a given ecosystem and that, when introduced to a non-native environment, is likely to cause economic or environmental harm or pose a hazard to human health.

4.3.9.1 Location and Extent

The Commonwealth of Pennsylvania is host to several invasive pathogens, insects, plants, invertebrates, fish, and higher mammals. These species have largely been introduced by the actions of humans. Common pathways for invasive species include unintentional release, the movement of goods and equipment that may unknowingly harbor species, smuggling, emptying ship ballast water, hull fouling, and escape from cultivation (Pennsylvania Invasive Species Council [PISC] 2010). Invasive species threats are generally divided into two main subsets, as described below.

- Aquatic invasive species are non-native viruses, invertebrates, fish, and aquatic plants that threaten the diversity or abundance of native species; the ecological stability of the infested waters; human health and safety; or commercial, agriculture, aquaculture, or recreational activities dependent on such waters.
- Terrestrial invasive species are non-native arthropods, vascular plants, higher vertebrates, or pathogens that complete their life cycle on land instead of water and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

The PISC, the lead organization for invasive species threats, has identified over 100 species threats that are or could potentially become significant in Pennsylvania. Of these threats, Chester County officials and municipal leaders have identified plants, insects, and diseases that have caused, or have potential to cause, significant damage to the county’s natural landscape and agricultural economy through defoliation and mortality, or out-competition for vital resources. Sections of Chester County’s Comprehensive Plan Landscape recognizes the importance of preserving and restoring natural resources, promoting and protecting native species, and maintaining agricultural productivity for the county’s cultural heritage and economic stability (Chester County 2018). The potential impact of invasive species on agriculture is significant, as Chester County has a vibrant agricultural community that is a significant driver of Chester County’s economy.

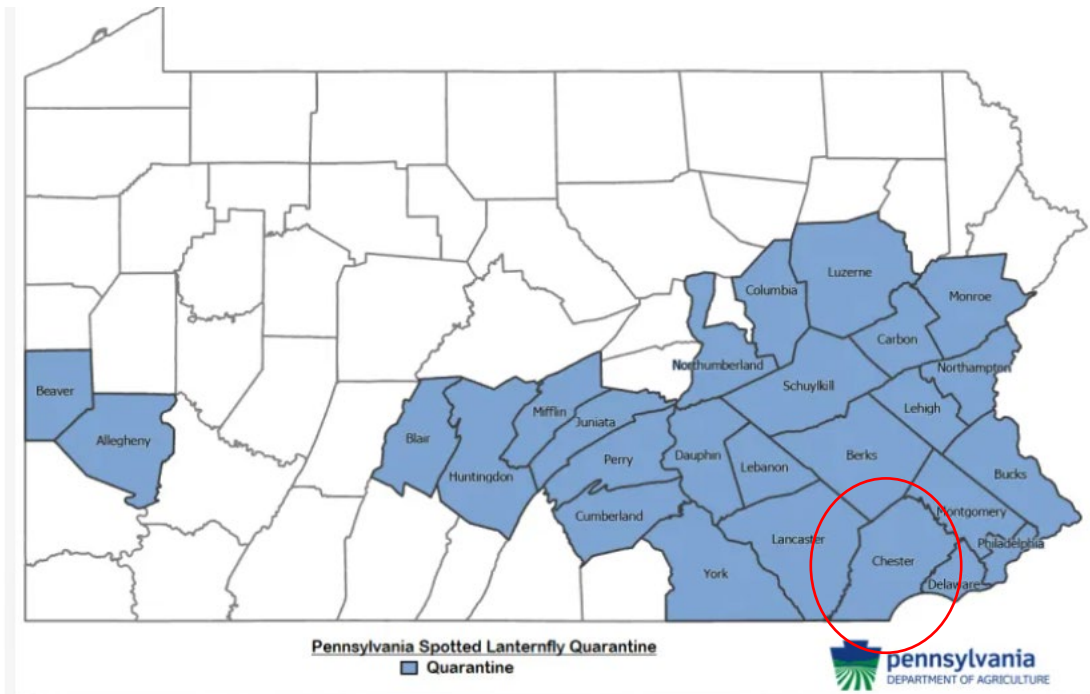
In Pennsylvania, the insects and diseases that have caused the most damage in terms of defoliation and mortality during recent years include the emerald ash borer, gypsy moth, hemlock woolly adelgid, beech bark disease, and oak wilt. These species also pose a threat to Chester County. Additionally, Chester County officials and municipal leaders identified a number of invasive insects, diseases, and plants that are of particular concern.

Invasive insects of concern in Chester County include the spotted lanternfly, thousand cankers disease, cankerworms, emerald ash borer, and Asian long-horned beetle (Penn State Agricultural Extension). Other invasive insects of concern for Chester County include the Chestnut blight, hemlock woolly adelgid, gypsy moth (Chester County Natural Heritage Inventory Update 2015). If defoliation occurs 2 years in a row, tree mortality is likely (Hoover and Haydt 2010).

The spotted lanternfly was first observed in neighboring Berks County in 2014. Since then, the pests have been found in 13 southeastern Pennsylvania counties, including Chester County (Yanisko 2017). As a result, the movement of firewood in Chester County and the other impacted counties is restricted and in 2020, a total of 26 counties are on Pennsylvania’s spotted lanternfly quarantine list, as shown in Figure 4.3.9-1. Spotted lanternflies threaten agricultural crops, including apples, grapes, and hardwoods (Pennsylvania Department of Agriculture [PDA] 2017), and would impact farms, orchards, and wineries. An infestation has the potential to cause \$18 billion worth of crop loss (Bresswein 2017).



Figure 4.3.9-1. Pennsylvania’s Spotted Lanternfly Quarantine, 2020



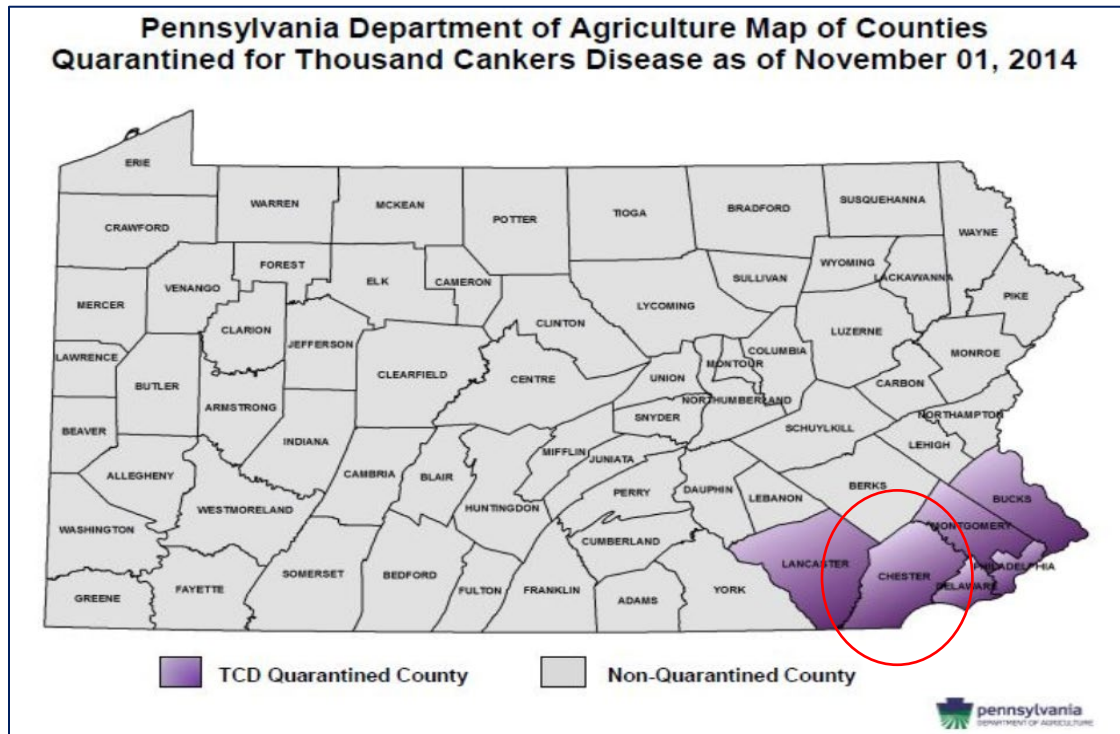
Source: PDA 2020

Note: Chester County is indicated by the red oval.

Thousand cankers disease was first identified in Bucks County in August 2011 and spread to Chester County in 2014. On July 22, 2014, a quarantine order was imposed to restrict the movement of walnut material from Bucks, Chester, Delaware, Montgomery, and Philadelphia counties. Figure 4.3.9-2 shows the few counties in Pennsylvania that were in quarantine as of 2014. This disease is transmitted to black walnut trees when walnut twig beetles carrying the fungus *Geosmithia morbida* tunnel beneath the bark, causing cankers to form. After repeated attacks, the cankers impede water and nutrient movement through the tree, resulting in tree death. Black walnut lumber is highly valued for woodworking and furniture-making, and the tree nuts are consumed by humans (PDA 2017b).



Figure 4.3.9-2. Pennsylvania’s Thousand Cankers Disease Quarantine, 2014



Source: PDA 2014

Note: Chester County is indicated by the red oval.

Asian long-horned beetles have been confirmed within Chester County and pose a threat to hardwood trees, including maples, birch, elm, willow, ash, and poplar trees. As they feed, larval beetles bore holes into the hardwood trees, eventually killing the tree (U.S. Department of Agriculture [USDA] 2017b).

Chestnut blight is a fungus that was first detected in New York City in 1904 and later discovered in Pennsylvania. The Chestnut blight wiped out most of the country’s American chestnut that once compromised one-fourth to one-half of eastern U.S. forests, and was prized as a food for humans, livestock, and wildlife and for its durable wood (Chester County Natural Heritage Inventory Update 2015).

A number of invasive plants also pose a significant threat to ecosystem biodiversity and agricultural productivity because of their ability to out-compete native species. Pennsylvania has identified 10 Class A noxious weeds as part of the Controlled Plant and Noxious Weed Act. These plants include Palmer amaranth, waterhemp, animated oat, dodder, goatsrue, giant hogweed, hydrilla, wavyleaf basketgrass, broomrape, and kudzu (PA Agricultural Code Title 7, 2016). Some species (e.g., Palmer amaranth and waterhemp) are prolific seed producers and have developed a potential resistance to traditional herbicides, making them challenging and expensive to manage. Others, like kudzu, grow rapidly and prevent slower-growing, native plants from establishing.

The Brandywine Conservancy identified a list of other invasive plants that pose a threat to the county. These plants include bamboo, bush honeysuckles, common reed, garlic mustard, Japanese barberry, Japanese honeysuckle, Japanese hop, Japanese knotweed, Japanese stiltgrass, lesser celandine, mile-a-minute, multiflora rose, Norway maple, oriental bittersweet, pachysandra, porcelain berry, privet, Russian and autumn olive, thistle, tree of heaven, wineberry, and winged euonymus (Brandywine Conservancy n.d.).

The location and extent of these invasive threats depends on the preferred habitat of the species as well as the species’ ease of movement and establishment.



4.3.9.2 Range of Magnitude

The magnitude of invasive species threats ranges from nuisance to widespread killer. Some invasive species are not considered agricultural pests and do not harm humans. Other invasive species can cause significant changes in the composition of Pennsylvania’s ecosystems. Forest or crop-impacting invasive species could have a significant economic impact in Chester County because the county hosts both forest-based recreation and a large, diverse agricultural sector. Still more invasive species can cause widespread illness or death in humans.

Invasive species contribute to a broad range of environmental impacts. The aggressive nature of many invasive species can cause significant reductions in biodiversity by crowding out native species. This can affect the health of individual host organisms as well as the overall well-being of the affected ecosystem.

Beyond causing human, animal, and plant harm, there are secondary impacts of invasive species in that they also cause harm to host species and ecosystems, particularly in the case of invasive species that attack forests or agricultural crops. Forests prevent soil degradation and erosion, protect watersheds, stabilize slopes, and absorb carbon dioxide emissions. The key role of forests in the hydrologic system means that if forest land is wiped out, the effects of erosion and flooding will be amplified. Invasive species would also negatively impact the county’s agricultural economy by increasing the cost of pest control measures and decreasing harvest yields. Overall, invasive species reduce the productivity and profitability of agricultural land. Invasive species that affect the health of hardwood trees can have particularly damaging secondary impacts in urban and suburban areas. As the damage progresses, branches become less stable and are more susceptible to winds. Significant building and auto damage can result from falling trees.

The magnitude of an invasive species threat is generally amplified when the ecosystem or host species is already stressed, such as in times of drought. The already-weakened state of the native ecosystem causes it to more easily succumb to an infestation. An example of a possible worst-case invasive species scenario is if the spotted lanternfly would continue to spread across Chester County and significantly destroy the county’s crops. With the high mortality rate associated with the spotted lanternfly, crops including grapes and apples would be devastated. Farms, orchards, and wineries could experience an \$18 billion loss (Bresswein 2017). Such significant crop loss could cause farms to collapse, resulting in the loss of jobs and valuable income to the county. If the land is no longer agriculturally profitable, arable land could be developed for residential or business use.

4.3.9.3 Past Occurrence

Invasive species have been entering Pennsylvania since the arrival of early European settlers. The presence of the emerald ash borer in Chester County was first confirmed in 2013. Chester County is part of the emerald ash borer infestation zone, along with 61 other Pennsylvania counties (USDA 2020). Additionally, the hemlock woolly adelgid has been present in Pennsylvania since the 1960s and was first detected in Chester County in the mid-1960s. DCNR continues to monitor the westerly progression of the invasive species, and since 2010, has detected a general movement west. Within the past 5 years, cankerworms and spotted lanternflies have been observed in Chester County and have the potential to cause significant crop and forest damage. Chester County is also part of the quarantine zone for the emerald ash borer and spotted lanternfly. As of April 29, 2011, the entire state of Pennsylvania was under quarantine for the emerald ash borer (USDA 2020). This means it is legal to move firewood, ash, and the insect between counties, but it is not legal to move non-compliant items out of the state or move non-compliant firewood into the state.

4.3.9.4 Future Occurrence

According to the PISC, the probability of future occurrence for invasive species threats is on the rise because of the growing volume of transported goods; increasing technology, efficiency, and speed of transportation; and expanding international trade agreements. Expanded global trade has created opportunities for many organisms to be transported to and established in new countries and regions. Furthermore, climate change is contributing to the introduction of new invasive species. As maximum and minimum seasonal temperatures change, pests are able to establish themselves in previously inhospitable climates. This also gives introduced species an earlier



start and increases the magnitude of their growth, which may shift the dominance of ecosystems in the favor of non-native species.

In order to combat the increase in future occurrences, the National Invasive Species Management Council—which is a collaboration of state agencies, public organizations, and federal agencies—released the Invasive Species Management Plan in May 2009 (Pennsylvania Invasive Species Management Council [PISC] 2018). This plan outlines the Commonwealth’s goals for the management of the spread of non-native invasive species and creates a framework for responding to threats through research, action, and public outreach and communication. More information on the Species Management Plan can be found online at www.invasivespeciescouncil.com. It is reasonable to assume that current threats, including the emerald ash borer, hemlock woolly adelgid, Asian long-horned beetle, spotted lanternfly, cankerworms, and thousand cankers disease, will continue to directly impact or threaten Chester County. Plants currently identified as part of the Noxious Weed Act including Palmer amaranth, waterhemp, animated oat, dodder, goatsrue, giant hogweed, hydrilla, wavyleaf basketgrass, broomrape, and kudzu are also likely to threaten Chester County.

The future occurrence of invasive species is considered *highly likely* as defined by the Risk Factor Methodology probability criteria (further discussed in Section 4.4).

4.3.9.5 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the area identified. The following sections discuss the potential impact of the invasive species hazard on Chester County, including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on (1) life, health, and safety; (2) general building stock and critical facilities; (3) economy; and (4) future growth and development
- Effect of climate change on vulnerability
- Additional data and next steps

Overview of Vulnerability

Chester County’s exact vulnerability will depend on the invasive species in question. However, in general, the University of Arizona and the National Invasive Species Information Center have identified the following characteristics of areas that are more likely to be invaded:

- Lack of natural predators or diseases to keep the species under control in its native environment
- Present vacant ecological niches that can be exploited by non-native species
- Lack of species diversity
- Lack of a multi-tiered canopy (in the case of invasive plants)
- Disturbed by fire, construction, or agriculture prior to invasion (University of Arizona 2006)

Estimated losses are difficult to quantify; however, infestation can impact Chester County’s population and economy. Direct effects of infestation lead to cascading indirect impacts. As vegetation dies or becomes stressed and weakened by pests such as the emerald ash borer, available fuel and high-intensity wildfires increase. As species compositions change due to infestation outbreaks, whole fire regimes can shift. Physical stresses on trees may also affect the way trees respond to other natural hazards such as hurricanes, drought, and ice storms (Kurtz 2007).

Because of the current presence of invasive species in Chester County, the county is vulnerable to invasive species. Despite quarantine and control efforts, invasive species movement occurs across county lines through anthropogenic and natural modes, including freight shipping, transplantation, and animal movement. Considering the extent of the current infestations and neighboring county infestations, it is reasonable to project that the county’s vulnerability will increase.



Data and Methodology

Because of lack of quantifiable loss information, a qualitative assessment has been used to evaluate assets exposed to this hazard and potential impacts associated with this hazard.

Impact on Life, Health, and Safety

The entire population of Chester County is vulnerable to invasive species to some extent, but direct impacts to life, health, and safety are minor.

Impact on General Building Stock and Critical Facilities

No structures are anticipated to be affected directly by infestation or invasive species; however, the emerald ash borer may cause a catastrophic loss of the ash tree throughout state forests, which could result in stream bank instability, erosion, and increased sedimentation. In addition, a preponderance of dead tree limbs could increase the occurrence of downed trees on roadways and utility lines during storms with heavy winds.

Impact on Economy

Impacts of infestation and invasive species on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with activities and programs implemented to conduct surveillance and address a variety of infestations within Chester County have not been quantified in available documentation. Losses from spotted lanternflies have been estimated for the state of Pennsylvania, and an infestation has the potential to cause \$324 million worth of crop loss to farms, orchards, and wineries including a loss of 2,800 jobs (Pennsylvania State University [PSU] 2020).

Although the economic impact has not been quantified for Chester County, state-wide agricultural losses due to invasive species were estimated at \$5,808,803,000 (Pennsylvania Emergency Management Agency [PEMA] 2013). The potential impact of invasive species on agriculture is significant because Chester County is one of the top-performing counties in the agricultural production of state total sales. Based on these figures, the potential agricultural loss from invasive species impacts could be billions of dollars.

Invasive species not only have an economic impact on agriculture but forests as well. Certain species such as the southern pine beetle can damage and kill trees leading to potential fires. First responders must focus on controlling the forest fires and their resources and personnel are limited.

Impact of Future Growth and Development

As discussed in Section 4.4, areas targeted for future growth and development have been identified across Chester County. Any areas of growth could be impacted by the infestation hazard because the entire planning area is exposed and vulnerable.

Change of Vulnerability

Invasive species were not profiled in the 2015 Chester County Hazard Mitigation Plan; therefore, the change in vulnerability to this hazard cannot be determined.

Additional Data and Next Steps

Any additional information regarding localized concerns and past impacts will be collected and analyzed. These data will be developed to support future revisions to the plan. Future mitigation efforts could include partnering and collaborating with existing Commonwealth of Pennsylvania and local efforts.



4.3.10 Nuclear Incident

This section provides a profile and vulnerability assessment of the nuclear incident hazard profile for the Chester County Hazard Mitigation Plan (HMP).

Nuclear hazards and incidents generally refer to incidents involving (1) a release of significant levels of radioactive materials or (2) exposure of workers or the general public to radiation. Primary concerns following a nuclear incident or accident are the impact on public health from (1) direct exposure to a radioactive plume; (2) inhalation of radioactive materials; (3) ingestion of contaminated food, water, and milk; and (4) long-term exposure to deposited radioactive materials in the environment that may lead to either acute (radiation sickness or death) or chronic (cancer) health effects.

The nuclear industry has adopted pre-determined, site-specific Emergency Action Levels (EAL). The EALs provide the framework and guidance for observing, addressing, and classifying the severity of site-specific incidents and conditions that are communicated to off-site emergency response organizations (Nuclear Regulatory Commission [NRC] 2008). Additional EALs specifically deal with issues of security, such as threats of airborne attack, hostile action within the facility, or attack on the facility. These EALs ensure that appropriate notifications of a security threat will occur in a timely manner.

The NRC encourages the use of probabilistic risk assessments (PRA) to estimate quantitatively the potential risk to public health and safety considering the design, operations, and maintenance practices at nuclear power plants. PRAs typically focus on accidents that can severely damage the core and that may challenge containment. Federal Emergency Management Agency (FEMA), Pennsylvania Emergency Management Agency (PEMA), and county governments have formulated radiological emergency response plans to prepare for radiological emergencies at the five nuclear power-generating facilities in the Commonwealth of Pennsylvania. These plans include a plume exposure pathway emergency planning zone (EPZ) (an area with a radius of 10 miles from each nuclear power facility) and an ingestion exposure pathway EPZ (an area with a radius of 50 miles from each facility).

Location and Extent

Stationary Facilities

There are five nuclear power generation stations located in Pennsylvania. While Chester County has no nuclear facilities within its borders, it falls within a 10-mile radius of two nuclear facilities. The Peach Bottom Atomic Power Station (Peach Bottom) is located to the west of West Nottingham Township and Limerick Generating Station is located to the northeast of East Coventry Township. Peach Bottom has two operating licensed units. Figure 4.3.10-1 provides illustrates Chester County location within the plume exposure pathway EPZ and ingestion exposure pathway EPZ of the nearby nuclear power plants.



Figure 4.3.10-1. Chester County Jurisdictions in the 10-Mile Plume Exposure Pathways

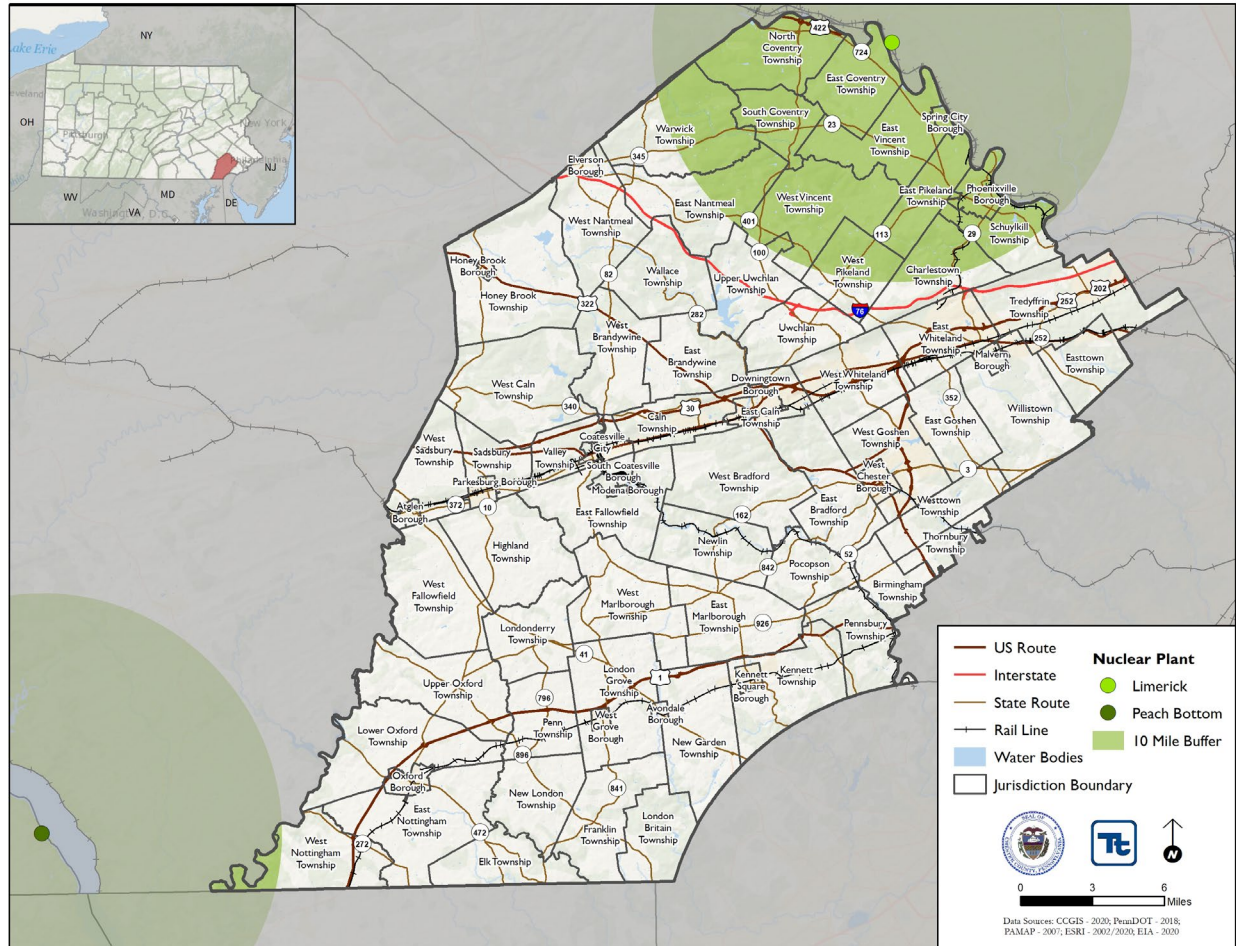


Table 4.3.10-1 lists the jurisdictions in Chester County that are located within the 10-mile EPZs for Limerick Generating Station and Peach Bottom.

Table 4.3.10-1. Chester County Jurisdictions in the Plume Exposure Pathway EPZs

Jurisdiction	10-Mile Plume Exposure Pathway EPZ – Limerick Generating Station	10-Mile Plume Exposure Pathway EPZ – Peach Bottom
Atglen (B)	No	No
Avondale (B)	No	No
Birmingham (Twp.)	No	No
Caln (Twp.)	No	No
Charlestown (Twp.)	Yes	No
Coatesville (C)	No	No
Downingtown (B)	No	No
East Bradford (Twp.)	No	No
East Brandywine (Twp.)	No	No
East Caln (Twp.)	No	No
East Coventry (Twp.)	Yes	No





Jurisdiction	10-Mile Plume Exposure Pathway EPZ – Limerick Generating Station	10-Mile Plume Exposure Pathway EPZ – Peach Bottom
East Fallowfield (Twp.)	No	No
East Goshen (Twp.)	No	No
East Marlborough (Twp.)	No	No
East Nantmeal (Twp.)	Yes	No
East Nottingham (Twp.)	No	No
East Pikeland (Twp.)	Yes	No
East Vincent (Twp.)	Yes	No
East Whiteland (Twp.)	No	No
Easttown (Twp.)	No	No
Elk (Twp.)	No	No
Elverson (B)	No	No
Franklin (Twp.)	No	No
Highland (Twp.)	No	No
Honey Brook (B)	No	No
Honey Brook (Twp.)	No	No
Kennett (Twp.)	No	No
Kennett Square (B)	No	No
London Britain (Twp.)	No	No
London Grove (Twp.)	No	No
Londonderry (Twp.)	No	No
Lower Oxford (Twp.)	No	No
Malvern (B)	No	No
Modena (B)	No	No
New Garden (Twp.)	No	No
New London (Twp.)	No	No
Newlin (Twp.)	No	No
North Coventry (Twp.)	Yes	No
Oxford (B)	No	No
Parkesburg (B)	No	No
Penn (Twp.)	No	No
Pennsbury (Twp.)	No	No
Phoenixville (B)	Yes	No
Pocopson (Twp.)	No	No
Sadsbury (Twp.)	No	No
Schuylkill (Twp.)	Yes	No
South Coatesville (B)	No	No
South Coventry (Twp.)	Yes	No
Spring City (B)	Yes	No
Thornbury (Twp.)	No	No
Tredyffrin (Twp.)	No	No
Upper Oxford (Twp.)	No	No
Upper Uwchlan (Twp.)	Yes	No
Uwchlan (Twp.)	No	No
Valley (Twp.)	No	No
Wallace (Twp.)	No	No
Warwick (Twp.)	Yes	No
West Bradford (Twp.)	No	No
West Brandywine (Twp.)	No	No
West Caln (Twp.)	No	No
West Chester (B)	No	No
West Fallowfield (Twp.)	No	No
West Goshen (Twp.)	No	No
West Grove (B)	No	No



Jurisdiction	10-Mile Plume Exposure Pathway EPZ – Limerick Generating Station	10-Mile Plume Exposure Pathway EPZ – Peach Bottom
West Marlborough (Twp.)	No	No
West Nantmeal (Twp.)	No	No
West Nottingham (Twp.)	No	Yes
West Pikeland (Twp.)	Yes	No
West Sadsbury (Twp.)	No	No
West Vincent (Twp.)	Yes	No
West Whiteland (Twp.)	No	No
Westtown (Twp.)	No	No
Willistown (Twp.)	No	No

Sources: Chester County Geographic Information System (GIS) 2020; Energy Information Administration 2020

Notes: % = Percent; B = Borough; C = City; EPZ = Emergency planning zone; Twp. = Township

Hazards in Transit

The U.S. Department of Energy transports used nuclear fuel to the repository by rail and road inside sealed containers. The used fuel may be shipped along specified highway routes. Rail is used to transport nuclear waste as well. However, no nuclear fuel is transported through Chester County.

Range of Magnitude

Plume exposure pathway EPZ are designed to consider whole-body external exposure to radiation from a radioactive plume and from deposited materials and inhalation exposure from the passing radioactive plume. The duration of primary exposures could range in length from hours to days. The 50-mile ingestion exposure pathway EPZ consider exposure primarily from ingestion of water or foods such as milk and fresh vegetables that have been contaminated with radiation. This kind of exposure can stem from any of the three categories of nuclear accident listed below. Although the 10-mile plume exposure EPZs include only portions of Chester County (shown in Figure 4.3.9-1 and Table 4.3.9-1), the entire county has the potential to be impacted through the ingestion exposure pathway.

Nuclear facility accidents are classified into three categories, and exposure to radiation can stem from any of the following three types of accidents:

- *Criticality accidents:* Involves loss of control of nuclear assemblies or power reactors.
- *Loss-of-coolant accidents:* Occurs whenever a reactor coolant system experiences a break or opening large enough that the coolant inventory in the system cannot be maintained by the normally operating make-up system.
- *Loss-of-containment accidents:* Involves the release of radioactivity from materials such as tritium; fission products; plutonium; and natural, depleted, or enriched uranium. Points of release have been containment vessels at fixed facilities or damaged packages during transportation accidents.

In accordance with regulations specified by FEMA and NRC, each facility is required to notify jurisdictional agencies of an incident or occurrence within that facility. NRC uses four classification levels for nuclear incidents (NRC 2008). PEMA and facility owners with whom PEMA coordinates use the following notification levels based on an internal trigger:

- *Unusual Event:* Incidents are occurring or have occurred that indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring off-site response or monitoring is expected unless further degradation occurs.



- *Alert:* Incidents are in process or have occurred that involve actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the U.S. Environmental Protection Agency (EPA) Protective Action Guides (PAG).
- *Site Area Emergency:* Incidents are in process or have occurred that resulted in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed EPA PAGs except near the site boundary.
- *General Emergency:* Incidents are in process or have occurred that have caused actual or imminent substantial core damage or melting of reactor fuel with potential for loss-of-containment integrity. Radioactive releases during a General Emergency can reasonably be expected to exceed the EPA PAGs over more than the immediate site area.

After a nuclear incident, the primary concern is the effect on the health of the population located near the incident. The duration of primary exposure could range in length from hours to months depending on the proximity to the point of radioactive release. External radiation and inhalation and ingestion of radioactive isotopes can cause acute health effects (e.g., death, severe health impairment), chronic health effects (e.g., cancers) and psychological effects.

Potential environmental impacts specific to the 50-mile ingestion exposure pathway EPZ include the long-term effects of radioactive contamination in the environment and in agricultural products. Chester County can expect some radioactive contamination in very small amounts in the case of a nuclear incident. This is not a significant concern in terms of external exposure and immediate health risks, but even a small amount of radiation will require the protection of the food chain, particularly milk supplies. Small amounts of radiation ingested over time could lead to future health issues. As a result, in the case of a nuclear incident, foodstuffs, crops, milk, livestock feed and forage, and farm water supplies will need to be protected from and tested for contamination, in accordance with Commonwealth and local radiological emergency response procedures. Additionally, spills and releases of radiologically active materials from accidents can result in the contamination of soil and public water supplies.

Scenario

The worst-case scenario nuclear incidents for Chester County would be if a General Emergency occurred at Limerick Generating Station or Peach Bottom that leaked sufficient radiation to create injuries and fatalities as well as longer-term damage in the form of contaminated water, soil, and food supplies in the county.

Past Occurrence

Nuclear incidents rarely occur, but the incident at Three-Mile Island (TMI) is the worst fixed-nuclear facility accident in U.S. history. The resulting contamination and state of the reactor core led to the development of a 14-year cleanup and scientific effort. Additionally, the President’s Commission on the Accident at TMI examined the costs of the accident, concluding that, “the accident at TMI on March 28, 1979, generated considerable economic disturbance. Some of the impacts were short term, occurring during the first days of the accident. Many of the impacts were experienced by the local community; others will be felt at the regional and national levels.” The report concluded: “It appears clear that the major costs of the TMI Unit 2 accident are associated with the emergency management replacement power and the plant refurbishment or replacement. The minimum cost estimate of nearly \$1 billion supports the argument that considerable additional resources can be cost effective if spent to guard against future accidents” (President’s Commission on the Accident at TMI 1978).

Despite the severity of the damage, no injuries due to radiation exposure occurred. However, numerous studies were conducted to determine the measurable health effects related to radiation and/or stress. More than a dozen



epidemiological and stress-related studies conducted to date have found no discernible direct health effects on the population in the vicinity of the plant. However, one study conducted by the Pennsylvania Department of Health’s (PA DOH) TMI Health Research Program did find evidence of psychological stress “lasting in some cases for five to six years,” as stated in the study report. According to the Program Chief, “the people suffering from stress perceived their health as being poorer than it actually was when the Health Department checked the medical records”(PA DOH, n.d.).

The issue of radiation effects resulting from the accident at TMI will continue to be debated. Radiation science does accept thresholds of expected mortality and morbidity resulting from the exposure to radiation. Administrative standards have been incorporated into plans used by public health officials and emergency planners for the purpose of making protective action decisions pertaining to sheltering and evacuation.

The accident at TMI had a profound effect on the residents, emergency management community, government officials, and nuclear industry, not only in Pennsylvania but nationwide. There were minimal requirements for off-site emergency planning for nuclear power stations prior to this accident. After the accident, comprehensive, coordinated, and exercised plans were developed for the state, counties, school districts, special facilities (hospitals, nursing homes, and detention facilities), and municipalities to ensure the safety of the population. Costs associated with an incident at one of the Commonwealth’s nuclear facilities, whether real or perceived, are significant. The mitigation efforts put in place immediately following the 1979 accident continue until today. The Commonwealth’s nuclear/radiological plan, which is a successor of the original “Annex E,” is a result of the Commonwealth’s efforts to address the many components of mitigation planning. The comprehensive planning involved with the five nuclear facilities is an ongoing effort. Plans are reviewed and amended on an annual basis. Recent amendments to various planning documents and station procedures include the efforts to enhance station security measures and the means to bolster communications and response in the incident of terrorist activities.

Another incident occurred at TMI on February 7, 1993, when an individual drove his car through a chain-link fence and then slammed into a roll-up garage door leading into the facility’s turbine building. Plant officials, fearing the worst, immediately declared a Site Area Emergency. Fortunately, the person who crashed the gate was found and apprehended.

An Alert was also declared at TMI on October 5, 2015. A small electrical fire occurred at the power plant, which was extinguished quickly and with no threat of the release of radiation (Associated Press 2015).

In addition to the TMI incidents, one Alert-level incident occurred at Peach Bottom. On July 4, 1992, a fire occurred around an off-site transformer, causing a loss of electrical power to the facility. Other than the power outage, there were no other consequences.

No large-scale nuclear incidents have taken place in the history of Chester County. The last incident involving a radioactive source occurred in 2005 when a Traxler gauge used by contractors for ground sampling fell off a truck. The device was found with no impact to the public.

Future Occurrence

Pennsylvania has the distinction of having experienced the only nuclear power plant General Emergency in the nation. Since the TMI incident, nuclear power has become significantly safer and is one of the most heavily regulated industries in the nation. Despite the knowledge gained since then, the potential still exists for a similar accident to occur again at one of the five nuclear-generating facilities in the Commonwealth.

Across the United States, several Unusual Event and Alert classification-level events occur each year at the 100+ nuclear facilities that warrant notification of local emergency managers. Of these, Alert emergencies occur less



frequently. For example, in 1997, 40 notifications of Unusual Events and three Alert events occurred nationwide. Based on historical events, Site Area Emergency and General Emergency incidents are very rare. Based on available historical data and the lack of nuclear incident events impacting Chester County, the future occurrence of nuclear incident events can be considered *unlikely* as defined by the Risk Factor Methodology probability criteria (further discussed in Section 4.4).

Vulnerability Assessment

To understand risk, a community must evaluate assets exposed or vulnerable within the identified hazard area. Effects of and risk from nuclear incidents are examined. The following sections evaluate and estimate potential impacts in Chester County:

- Overview of vulnerability
- Impacts on (1) life, health, and safety; (2) general building stock; (3) critical facilities, (4) the economy, and (5) the environment
- Cascading effect on other hazards
- Future growth and development

Overview of Vulnerability

Effects from a radiological incident at a fixed facility would vary depending on the product released (type of radiation), amount of radiation released, current weather conditions, and time of day. The vulnerability analysis discussed in the following sections examined exposure from three different nuclear power plants:

1. Peach Bottom Atomic Power Station
2. Limerick Generating Station
3. Salem-Hope Creek Nuclear Power Plant

The priority following an incident at any of the facilities within the Commonwealth of Pennsylvania is the life and safety of all individuals within the area impacted. Secondary to health and safety would be effects on critical infrastructure, environment, property, and the economy.

Impact on Life, Health, and Safety

Nuclear power plants use energy from the decay of radioactive isotopes. If an accident occurs and these isotopes are released, they can pose a great danger to human health. The younger population is considered particularly vulnerable to this hazard (National Cancer Institute 2020). According to the 2018 American Community Survey 5-year estimate, 29,076 persons under 5 years old reside in the county (U.S. Census 2018).

Only portions of Chester County are located within the 10-mile plume EPZ of Limerick Generating Station or Peach Bottom, while the entire county is located within the 50-mile ingestion EPZ. West Nottingham Township is the only jurisdiction within the Peach Bottom Atomic Power Station 10-mile EPZ. Approximately 69 people reside within this plume area. The remaining exposed persons are within the 10-mile Limerick Generating Station. Phoenixville Borough has the greatest number of exposed residents, with 16,815 people or 100 percent of the jurisdiction considered exposed to a potential release from the Limerick Station. Along with the population residing in these areas, first responders on scene are also at risk. First responders potentially might not have access to incidents due to damaged infrastructure. Electrical/utility fires may increase with disruptions to lines as well, so first responders would have additional tasks during nuclear incident events.

Table 4.3.10-2 summarizes the population exposed in nuclear power plant buffer zones within Chester County.



Table 4.3.10-2. Population Exposed to Nuclear Power Plant Buffer Areas

Jurisdiction	Total Population	Number of Persons Within 10 Miles of Peach Bottom Atomic Power Station		Number of Persons Within 10 Miles of the Limerick Generating Station	
		Number of People	Percent of Total	Number of People	Percent of Total
Atglen (B)	1,459	0	0.0%	0	0.0%
Avondale (B)	1,295	0	0.0%	0	0.0%
Birmingham (Twp.)	4,207	0	0.0%	0	0.0%
Caln (Twp.)	14,198	0	0.0%	0	0.0%
Charlestown (Twp.)	5,813	1,933	33.3%	0	0.0%
Coatesville (C)	13,147	0	0.0%	0	0.0%
Downingtown (B)	7,929	0	0.0%	0	0.0%
East Bradford (Twp.)	9,959	0	0.0%	0	0.0%
East Brandywine (Twp.)	8,416	0	0.0%	0	0.0%
East Caln (Twp.)	4,876	0	0.0%	0	0.0%
East Coventry (Twp.)	6,770	6,770	100.0%	0	0.0%
East Fallowfield (Twp.)	7,567	0	0.0%	0	0.0%
East Goshen (Twp.)	18,199	0	0.0%	0	0.0%
East Marlborough (Twp.)	7,326	0	0.0%	0	0.0%
East Nantmeal (Twp.)	1,723	520	30.2%	0	0.0%
East Nottingham (Twp.)	8,929	0	0.0%	0	0.0%
East Pikeland (Twp.)	7,331	7,331	100.0%	0	0.0%
East Vincent (Twp.)	10,603	10,603	100.0%	0	0.0%
East Whiteland (Twp.)	7,062	0	0.0%	0	0.0%
Easttown (Twp.)	11,415	0	0.0%	0	0.0%
Elk (Twp.)	1,786	0	0.0%	0	0.0%
Elverson (B)	1,405	0	0.0%	0	0.0%
Franklin (Twp.)	4,506	0	0.0%	0	0.0%
Highland (Twp.)	1,370	0	0.0%	0	0.0%
Honey Brook (B)	1,865	0	0.0%	0	0.0%
Honey Brook (Twp.)	8,205	0	0.0%	0	0.0%
Kennett (Twp.)	8,177	0	0.0%	0	0.0%
Kennett Square (B)	6,159	0	0.0%	0	0.0%
London Britain (Twp.)	3,241	0	0.0%	0	0.0%
London Grove (Twp.)	2,450	0	0.0%	0	0.0%
Londonderry (Twp.)	8,615	0	0.0%	0	0.0%
Lower Oxford (Twp.)	5,058	0	0.0%	0	0.0%
Malvern (B)	3,440	0	0.0%	0	0.0%



Jurisdiction	Total Population	Number of Persons Within 10 Miles of Peach Bottom Atomic Power Station		Number of Persons Within 10 Miles of the Limerick Generating Station	
		Number of People	Percent of Total	Number of People	Percent of Total
Modena (B)	873	0	0.0%	0	0.0%
New Garden (Twp.)	12,111	0	0.0%	0	0.0%
New London (Twp.)	1,312	0	0.0%	0	0.0%
Newlin (Twp.)	5,921	0	0.0%	0	0.0%
North Coventry (Twp.)	7,996	7,973	99.7%	0	0.0%
Oxford (B)	5,420	0	0.0%	0	0.0%
Parkesburg (B)	3,781	0	0.0%	0	0.0%
Penn (Twp.)	5,511	0	0.0%	0	0.0%
Pennsbury (Twp.)	3,649	0	0.0%	0	0.0%
Phoenixville (B)	16,815	16,815	100.0%	0	0.0%
Pocopson (Twp.)	4,838	0	0.0%	0	0.0%
Sadsbury (Twp.)	3,919	0	0.0%	0	0.0%
Schuylkill (Twp.)	8,639	4,063	47.0%	0	0.0%
South Coatesville (B)	1,276	0	0.0%	0	0.0%
South Coventry (Twp.)	2,631	2,631	100.0%	0	0.0%
Spring City (B)	3,320	3,320	100.0%	0	0.0%
Thornbury (Twp.)	3,181	0	0.0%	0	0.0%
Tredyffrin (Twp.)	29,481	0	0.0%	0	0.0%
Upper Oxford (Twp.)	2,518	0	0.0%	0	0.0%
Upper Uwchlan (Twp.)	11,509	11	0.1%	0	0.0%
Uwchlan (Twp.)	18,869	0	0.0%	0	0.0%
Valley (Twp.)	7,661	0	0.0%	0	0.0%
Wallace (Twp.)	3,678	0	0.0%	0	0.0%
Warwick (Twp.)	2,543	614	24.1%	0	0.0%
West Bradford (Twp.)	12,869	0	0.0%	0	0.0%
West Brandywine (Twp.)	7,482	0	0.0%	0	0.0%
West Caln (Twp.)	9,080	0	0.0%	0	0.0%
West Chester (B)	19,888	0	0.0%	0	0.0%
West Fallowfield (Twp.)	2,596	0	0.0%	0	0.0%
West Goshen (Twp.)	23,021	0	0.0%	0	0.0%
West Grove (B)	2,846	0	0.0%	0	0.0%
West Marlborough (Twp.)	771	0	0.0%	0	0.0%
West Nantmeal (Twp.)	1,999	0	0.0%	0	0.0%
West Nottingham (Twp.)	2,718	0	0.0%	69	2.5%



Jurisdiction	Total Population	Number of Persons Within 10 Miles of Peach Bottom Atomic Power Station		Number of Persons Within 10 Miles of the Limerick Generating Station	
		Number of People	Percent of Total	Number of People	Percent of Total
West Pikeland (Twp.)	4,069	1,528	37.6%	0	0.0%
West Sadsbury (Twp.)	2,393	0	0.0%	0	0.0%
West Vincent (Twp.)	5,257	3,315	63.1%	0	0.0%
West Whiteland (Twp.)	18,403	0	0.0%	0	0.0%
Westtown (Twp.)	10,916	0	0.0%	0	0.0%
Willistown (Twp.)	10,895	0	0.0%	0	0.0%
Chester County (Total)	517,156	67,359	13.0%	69	0.01%

Sources: U.S. Census 2018; Chester County GIS 2020

Notes: % = Percent; B = Borough; C = City; Twp. = Township

Impact on General Building Stock

A nuclear explosion can have similar effects to those produced by conventional explosives. The resulting shock from a nuclear explosion can collapse structures and generate flying debris. Additionally, thermal radiation resulting from a nuclear explosion could ignite fires or coalesce into a firestorm (National Research Council 2005). Other potential damages to the general building stock from a nuclear plant incident can be difficult to qualify, as potential losses may include inaccessibility, and/or potential structural and content losses.

To estimate the buildings exposed to a nuclear incident event, the EPZ areas were overlaid upon the building level. The replacement cost value of the structures with their center in the buffer areas were totaled and summarized in Table 4.3.10-3.

Table 4.3.10-3. Total Building Exposure to Nuclear Power Plant Buffer Areas

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
Atglen (B)	583	\$300,171,233	0	0.0%	\$0	0.0%
Avondale (B)	436	\$275,491,131	0	0.0%	\$0	0.0%
Birmingham (Twp.)	1,774	\$1,521,752,088	0	0.0%	\$0	0.0%
Caln (Twp.)	5,696	\$4,389,258,174	0	0.0%	\$0	0.0%
Charlestown (Twp.)	2,655	\$2,334,124,537	924	34.8%	\$692,835,856	29.7%
Coatesville (C)	3,545	\$2,658,702,748	0	0.0%	\$0	0.0%
Downingtown (B)	2,619	\$2,678,308,815	0	0.0%	\$0	0.0%
East Bradford (Twp.)	4,033	\$3,166,888,223	0	0.0%	\$0	0.0%
East Brandywine (Twp.)	4,201	\$2,499,920,165	0	0.0%	\$0	0.0%
East Caln (Twp.)	1,509	\$1,864,909,402	0	0.0%	\$0	0.0%
East Coventry (Twp.)	3,832	\$2,200,926,728	3,832	100.0%	\$2,200,926,728	100.0%



Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
East Fallowfield (Twp.)	4,025	\$1,984,687,476	0	0.0%	\$0	0.0%
East Goshen (Twp.)	6,498	\$5,680,635,001	0	0.0%	\$0	0.0%
East Marlborough (Twp.)	3,888	\$3,646,563,821	0	0.0%	\$0	0.0%
East Nantmeal (Twp.)	1,509	\$1,131,945,456	397	26.3%	\$280,649,181	24.8%
East Nottingham (Twp.)	4,960	\$3,185,167,607	0	0.0%	\$0	0.0%
East Pikeland (Twp.)	3,959	\$2,751,413,608	3,959	100.0%	\$2,751,413,608	100.0%
East Vincent (Twp.)	3,872	\$2,764,012,516	3,872	100.0%	\$2,764,012,516	100.0%
East Whiteland (Twp.)	5,002	\$8,143,686,632	0	0.0%	\$0	0.0%
Easttown (Twp.)	4,583	\$3,998,338,009	0	0.0%	\$0	0.0%
Elk (Twp.)	1,361	\$754,193,647	0	0.0%	\$0	0.0%
Elverson (B)	716	\$516,332,051	0	0.0%	\$0	0.0%
Franklin (Twp.)	2,468	\$1,537,535,450	0	0.0%	\$0	0.0%
Highland (Twp.)	1,304	\$1,067,555,265	0	0.0%	\$0	0.0%
Honey Brook (B)	771	\$446,825,932	0	0.0%	\$0	0.0%
Honey Brook (Twp.)	4,871	\$3,389,705,910	0	0.0%	\$0	0.0%
Kennett (Twp.)	4,166	\$4,134,894,338	0	0.0%	\$0	0.0%
Kennett Square (B)	1,956	\$1,600,982,472	0	0.0%	\$0	0.0%
London Britain (Twp.)	1,782	\$1,064,040,035	0	0.0%	\$0	0.0%
London Grove (Twp.)	4,233	\$3,148,102,405	0	0.0%	\$0	0.0%
Londonderry (Twp.)	1,755	\$1,034,199,367	0	0.0%	\$0	0.0%
Lower Oxford (Twp.)	2,585	\$2,325,017,464	0	0.0%	\$0	0.0%
Malvern (B)	1,149	\$1,256,307,741	0	0.0%	\$0	0.0%
Modena (B)	226	\$143,886,459	0	0.0%	\$0	0.0%
New Garden (Twp.)	5,418	\$5,996,313,471	0	0.0%	\$0	0.0%
New London (Twp.)	2,955	\$1,850,994,293	0	0.0%	\$0	0.0%
Newlin (Twp.)	1,188	\$767,919,221	0	0.0%	\$0	0.0%
North Coventry (Twp.)	4,367	\$2,814,129,243	4,354	99.7%	\$2,805,409,434	99.7%
Oxford (B)	1,795	\$1,620,222,123	0	0.0%	\$0	0.0%
Parkesburg (B)	1,478	\$791,790,495	0	0.0%	\$0	0.0%
Penn (Twp.)	2,962	\$3,335,917,017	0	0.0%	\$0	0.0%
Pennsbury (Twp.)	1,793	\$1,741,030,601	0	0.0%	\$0	0.0%
Phoenixville (B)	6,031	\$4,404,373,172	6,031	100.0%	\$4,404,373,172	100.0%
Pocopson (Twp.)	1,781	\$1,616,048,060	0	0.0%	\$0	0.0%
Sadsbury (Twp.)	2,244	\$1,514,078,865	0	0.0%	\$0	0.0%
Schuylkill (Twp.)	4,116	\$3,296,773,180	1,988	48.3%	\$1,592,917,751	48.3%



Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Number of Buildings	Percent Total	Replacement Cost Value	Percent Total
South Coatesville (B)	669	\$656,482,254	0	0.0%	\$0	0.0%
South Coventry (Twp.)	1,655	\$1,175,837,157	1,655	100.0%	\$1,175,837,157	100.0%
Spring City (B)	1,282	\$913,935,869	1,282	100.0%	\$913,935,869	100.0%
Thornbury (Twp.)	1,222	\$1,249,939,720	0	0.0%	\$0	0.0%
Tredyffrin (Twp.)	10,751	\$13,427,976,905	0	0.0%	\$0	0.0%
Upper Oxford (Twp.)	2,098	\$1,327,197,078	0	0.0%	\$0	0.0%
Upper Uwchlan (Twp.)	4,459	\$3,757,709,779	4	0.1%	\$1,840,193	0.0%
Uwchlan (Twp.)	6,633	\$7,025,589,763	0	0.0%	\$0	0.0%
Valley (Twp.)	3,430	\$2,597,377,442	0	0.0%	\$0	0.0%
Wallace (Twp.)	2,069	\$1,322,743,721	0	0.0%	\$0	0.0%
Warwick (Twp.)	2,175	\$1,133,542,100	498	22.9%	\$256,768,129	22.7%
West Bradford (Twp.)	6,163	\$3,995,074,181	0	0.0%	\$0	0.0%
West Brandywine (Twp.)	4,149	\$2,231,906,820	0	0.0%	\$0	0.0%
West Caln (Twp.)	6,021	\$2,765,167,902	0	0.0%	\$0	0.0%
West Chester (B)	4,156	\$5,374,643,016	0	0.0%	\$0	0.0%
West Fallowfield (Twp.)	2,171	\$1,743,066,295	0	0.0%	\$0	0.0%
West Goshen (Twp.)	8,399	\$9,444,801,871	0	0.0%	\$0	0.0%
West Grove (B)	1,053	\$499,625,186	0	0.0%	\$0	0.0%
West Marlborough (Twp.)	967	\$997,081,475	0	0.0%	\$0	0.0%
West Nantmeal (Twp.)	1,830	\$1,139,858,316	0	0.0%	\$0	0.0%
West Nottingham (Twp.)	1,989	\$1,196,217,005	30	1.5%	\$22,674,327	1.9%
West Pikeland (Twp.)	2,120	\$1,506,034,830	869	41.0%	\$690,529,898	45.9%
West Sadsbury (Twp.)	1,876	\$1,651,357,888	0	0.0%	\$0	0.0%
West Vincent (Twp.)	3,532	\$2,587,356,437	2,334	66.1%	\$1,596,514,061	61.7%
West Whiteland (Twp.)	7,022	\$7,660,221,171	0	0.0%	\$0	0.0%
Westtown (Twp.)	4,175	\$3,282,102,771	0	0.0%	\$0	0.0%
Willistown (Twp.)	6,043	\$4,727,817,226	0	0.0%	\$0	0.0%
Chester County (Total)	232,759	\$194,736,735,824	32,029	13.8%	\$22,150,637,879	11.4%

Sources: Chester County GIS 2020; RSMeans 2019

Notes: % = Percent; B = Borough; C = City; Twp. = Township

Impact on Land Use

The county’s primary vulnerability to nuclear incidents comes in the form of food, soil, and water contamination. A 50-mile radioactive plume from the Peach Bottom Atomic Power Station or the Limerick Generation Station would extend over the entire county. Approximately 168,349 acres of agricultural land in Chester County are vulnerable to radiological contamination in a nuclear incident.





A 50-mile agricultural plume exposure analysis was also conducted from the Salem-Hope Creek Nuclear Power Plant in Salem, New Jersey. This plume would cover 446,839 acres (92 percent) of the county. Of the agricultural land in the county, the plume would extend over 162,897 acres. Agricultural land in each Chester County jurisdiction that would be exposed to an nuclear incident from the Salem-Hope Creek Power Plant is summarized in Table 4.3.10-4.

Table 4.3.10-4. Agricultural Land Exposed to a 50-Mile Salem-Hope Creek Power Plant EPZ Plume

Jurisdiction	Acres of Agriculture	Acres of Agriculture within 50-Mile Salem Power Plant Plume	Percent of Total
Atglen (B)	144	144	100.0%
Avondale (B)	24	24	100.0%
Birmingham (Twp.)	838	838	100.0%
Caln (Twp.)	415	415	100.0%
Charlestown (Twp.)	1,714	1,714	100.0%
Coatesville (C)	12	12	100.0%
Downingtown (B)	34	34	100.0%
East Bradford (Twp.)	2,333	2,333	100.0%
East Brandywine (Twp.)	2,196	2,196	100.0%
East Caln (Twp.)	38	38	100.0%
East Coventry (Twp.)	2,858	708	24.8%
East Fallowfield (Twp.)	3,507	3,507	100.0%
East Goshen (Twp.)	652	652	100.0%
East Marlborough (Twp.)	4,521	4,521	100.0%
East Nantmeal (Twp.)	3,178	3,178	100.0%
East Nottingham (Twp.)	7,644	7,644	100.0%
East Pikeland (Twp.)	1,542	1,542	100.0%
East Vincent (Twp.)	4,239	4,088	96.4%
East Whiteland (Twp.)	567	567	100.0%
Easttown (Twp.)	530	530	100.0%
Elk (Twp.)	3,356	3,356	100.0%
Elverson (B)	166	84	50.5%
Franklin (Twp.)	3,621	3,621	100.0%
Highland (Twp.)	7,760	7,760	100.0%
Honey Brook (B)	59	59	100.0%
Honey Brook (Twp.)	8,549	8,549	100.0%
Kennett (Twp.)	2,530	2,530	100.0%
Kennett Square (B)	6	6	100.0%
London Britain (Twp.)	1,663	1,663	100.0%
London Grove (Twp.)	5,404	5,404	100.0%
Londonderry (Twp.)	4,405	4,405	100.0%
Lower Oxford (Twp.)	6,884	6,884	100.0%
Malvern (B)	65	65	100.0%
Modena (B)	4	4	100.0%
New Garden (Twp.)	2,916	2,916	100.0%
New London (Twp.)	2,929	2,929	100.0%
Newlin (Twp.)	3,349	3,349	100.0%
North Coventry (Twp.)	1,696	0	0.0%
Oxford (B)	340	340	100.0%
Parkesburg (B)	88	88	100.0%
Penn (Twp.)	3,090	3,090	100.0%
Pennsbury (Twp.)	1,581	1,581	100.0%
Phoenixville (B)	61	61	100.0%
Pocopson (Twp.)	2,048	2,048	100.0%
Sadsbury (Twp.)	1,551	1,551	100.0%



Jurisdiction	Acres of Agriculture	Acres of Agriculture within 50-Mile Salem Power Plant Plume	Percent of Total
Schuylkill (Twp.)	663	663	100.0%
South Coatesville (B)	90	90	100.0%
South Coventry (Twp.)	1,242	913	73.5%
Spring City (B)	40	40	100.0%
Thornbury (Twp.)	316	316	100.0%
Tredyffrin (Twp.)	931	931	100.0%
Upper Oxford (Twp.)	7,242	7,242	100.0%
Upper Uwchlan (Twp.)	1,841	1,841	100.0%
Uwchlan (Twp.)	876	876	100.0%
Valley (Twp.)	507	507	100.0%
Wallace (Twp.)	1,922	1,922	100.0%
Warwick (Twp.)	2,776	1,747	62.9%
West Bradford (Twp.)	2,768	2,768	100.0%
West Brandywine (Twp.)	2,809	2,809	100.0%
West Caln (Twp.)	4,568	4,568	100.0%
West Chester (B)	3	3	100.0%
West Fallowfield (Twp.)	8,017	8,017	100.0%
West Goshen (Twp.)	281	281	100.0%
West Grove (B)	1	1	100.0%
West Marlborough (Twp.)	7,592	7,592	100.0%
West Nantmeal (Twp.)	4,275	4,260	99.7%
West Nottingham (Twp.)	3,256	3,256	100.0%
West Pikeland (Twp.)	1,806	1,806	100.0%
West Sadsbury (Twp.)	3,797	3,797	100.0%
West Vincent (Twp.)	4,054	4,054	100.0%
West Whiteland (Twp.)	948	948	100.0%
Westtown (Twp.)	836	836	100.0%
Willistown (Twp.)	3,784	3,784	100.0%
Chester County (Total)	168,349	162,897	96.8%

Sources: Chester County GIS 2020; U.S. Geological Survey (USGS) 2016
 Notes: % = Percent; B = Borough; C = City; Twp. = Township

According to the U.S. Department of Agriculture (USDA) 2017 Census of Agriculture, the market value of all agricultural products of farms totaled approximately \$712 million for the county. While unlikely that all agricultural products would be lost in the event of a nuclear incident, the county can expect some portion to be lost. Time of year also impacts the vulnerability and losses estimated for a nuclear incident; an incident that occurs during the prime growing and harvesting season will have a larger impact on the county (USDA 2017).

Impact on Critical Facilities

Potential damages to critical facilities from a nuclear plant incident can be difficult to qualify, as potential losses may include loss of service and/or potential structural and content losses. A significant incident causing contamination or an explosion within an urban area may force businesses, public services, and utility services to close for an extended period.

Table 4.3.10-5 summarizes critical facilities located in the nuclear power plant buffer areas. Overall, 535 critical facilities are exposed to a nuclear incident event. Of these 535 critical facilities, 376 are considered lifelines (70.3 percent of all critical facilities).



Table 4.3.10-5. Critical Facilities Exposure to Nuclear Power Plant Buffer Areas

Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Atglen (B)	20	17	0	0.0%	0	0.0%
Avondale (B)	19	15	0	0.0%	0	0.0%
Birmingham (Twp.)	34	26	0	0.0%	0	0.0%
Caln (Twp.)	101	70	0	0.0%	0	0.0%
Charlestown (Twp.)	64	45	28	43.8%	25	55.6%
Coatesville (C)	79	45	0	0.0%	0	0.0%
Downingtown (B)	86	53	0	0.0%	0	0.0%
East Bradford (Twp.)	73	61	0	0.0%	0	0.0%
East Brandywine (Twp.)	49	40	0	0.0%	0	0.0%
East Caln (Twp.)	64	29	0	0.0%	0	0.0%
East Coventry (Twp.)	49	37	49	100.0%	37	100.0%
East Fallowfield (Twp.)	77	58	0	0.0%	0	0.0%
East Goshen (Twp.)	76	43	0	0.0%	0	0.0%
East Marlborough (Twp.)	53	34	0	0.0%	0	0.0%
East Nantmeal (Twp.)	31	25	6	19.4%	4	16.0%
East Nottingham (Twp.)	46	37	0	0.0%	0	0.0%
East Pikeland (Twp.)	50	35	50	100.0%	35	100.0%
East Vincent (Twp.)	60	40	60	100.0%	40	100.0%
East Whiteland (Twp.)	185	100	0	0.0%	0	0.0%
Easttown (Twp.)	69	37	0	0.0%	0	0.0%
Elk (Twp.)	18	17	0	0.0%	0	0.0%
Elverson (B)	13	5	0	0.0%	0	0.0%
Franklin (Twp.)	29	23	0	0.0%	0	0.0%
Highland (Twp.)	24	18	0	0.0%	0	0.0%
Honey Brook (B)	17	11	0	0.0%	0	0.0%
Honey Brook (Twp.)	45	26	0	0.0%	0	0.0%
Kennett (Twp.)	81	56	0	0.0%	0	0.0%
Kennett Square (B)	42	25	0	0.0%	0	0.0%
London Britain (Twp.)	22	20	0	0.0%	0	0.0%
London Grove (Twp.)	77	60	0	0.0%	0	0.0%
Londonderry (Twp.)	23	18	0	0.0%	0	0.0%
Lower Oxford (Twp.)	57	46	0	0.0%	0	0.0%
Malvern (B)	29	18	0	0.0%	0	0.0%
Modena (B)	11	8	0	0.0%	0	0.0%
New Garden (Twp.)	97	53	0	0.0%	0	0.0%
New London (Twp.)	21	18	0	0.0%	0	0.0%



Section 4.3.10: Risk Assessment – Nuclear Incident

Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Newlin (Twp.)	34	33	0	0.0%	0	0.0%
North Coventry (Twp.)	63	40	63	100.0%	40	100.0%
Oxford (B)	52	24	0	0.0%	0	0.0%
Parkesburg (B)	36	23	0	0.0%	0	0.0%
Penn (Twp.)	45	29	0	0.0%	0	0.0%
Pennsbury (Twp.)	46	34	0	0.0%	0	0.0%
Phoenixville (B)	88	54	88	100.0%	54	100.0%
Pocopson (Twp.)	40	35	0	0.0%	0	0.0%
Sadsbury (Twp.)	46	28	0	0.0%	0	0.0%
Schuylkill (Twp.)	75	45	52	69.3%	28	62.2%
South Coatesville (B)	22	12	0	0.0%	0	0.0%
South Coventry (Twp.)	43	36	43	100.0%	36	100.0%
Spring City (B)	17	10	17	100.0%	10	100.0%
Thornbury (Twp.)	21	18	0	0.0%	0	0.0%
Tredyffrin (Twp.)	303	186	0	0.0%	0	0.0%
Upper Oxford (Twp.)	27	19	0	0.0%	0	0.0%
Upper Uwchlan (Twp.)	61	43	0	0.0%	0	0.0%
Uwchlan (Twp.)	110	47	0	0.0%	0	0.0%
Valley (Twp.)	60	43	0	0.0%	0	0.0%
Wallace (Twp.)	34	31	0	0.0%	0	0.0%
Warwick (Twp.)	46	35	7	15.2%	5	14.3%
West Bradford (Twp.)	60	44	0	0.0%	0	0.0%
West Brandywine (Twp.)	49	39	0	0.0%	0	0.0%
West Caln (Twp.)	39	27	0	0.0%	0	0.0%
West Chester (B)	100	59	0	0.0%	0	0.0%
West Fallowfield (Twp.)	31	24	0	0.0%	0	0.0%
West Goshen (Twp.)	178	99	0	0.0%	0	0.0%
West Grove (B)	18	10	0	0.0%	0	0.0%
West Marlborough (Twp.)	27	24	0	0.0%	0	0.0%
West Nantmeal (Twp.)	31	21	0	0.0%	0	0.0%
West Nottingham (Twp.)	28	16	0	0.0%	0	0.0%
West Pikeland (Twp.)	44	39	33	75.0%	29	74.4%
West Sadsbury (Twp.)	37	19	0	0.0%	0	0.0%
West Vincent (Twp.)	47	39	39	83.0%	33	84.6%
West Whiteland (Twp.)	217	149	0	0.0%	0	0.0%
Westtown (Twp.)	46	31	0	0.0%	0	0.0%
Willistown (Twp.)	90	49	0	0.0%	0	0.0%



Jurisdiction	Total CFs Located in Jurisdiction	Total Lifelines Located in Jurisdiction	Number of Critical Facilities and Lifeline Facilities Within 10 Miles of Peach Bottom Atomic Power Station or the Limerick Generating Station			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
Chester County (Total)	4,202	2,783	535	12.7%	376	13.5%

Sources: Chester County GIS 2020; RSMeans 2019

Notes: % = Percent; B = Borough; C = City; CF = Critical facilities; Twp. = Township

Impact on Economy

Contamination of agriculture, livestock, and production can lead to loss of commerce with other regions of the state, country, and even the world. Recently, many countries halted imports of products from Japan for fear of contamination following the tsunami-related nuclear incident at the Fukushima Power Plant. This loss in revenue compounded losses that Japan and region surrounding the power plant were already encountering following the initial disaster.

Impact on the Environment

The release of radioactive materials has a profound impact on animals. Radiation causes genetic anomalies, leading to decreased reproduction, deformities, and death. High levels of contamination can also appear in plants and last for decades. For instance, Caesium-137, a radioactive fission product of nuclear plants, still appears around the 1986 Chernobyl incident site (Wai, et al 2020).

Cascading Impacts to Other Hazards

A nuclear event can cause utility failure. If an explosion or contamination occurred, water quality and supply could stop or drastically decrease while the facility restored service. Thermal radiation from a nuclear explosion can also cause firestorms, leading to structural fires among buildings (National Research Council 2005). Section 4.3.18, Utility Interruption, and Section 4.3.14, Structural Fires, provides more information.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the county can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

An increase in development and population can increase vulnerability in the event of a nuclear incident. Future development can also increase the likelihood of an incident. The tables and hazard maps included in the jurisdictional annexes in this HMP contain additional information regarding the specific areas of development that would increase county vulnerability to the nuclear incident hazard.

Projected Changes in Population

Estimated population projections provided by the Center of Rural Pennsylvania indicates that Chester’s population will continue to increase into 2040, increasing total population to approximately 603,068 persons (Center of Rural Pennsylvania 2013). Persons that move into nuclear incident exposure areas are at greater risk impact in the event of a spill or toxin release.



Climate Change

Nuclear power plants do not produce greenhouse gas emissions and therefore no immediate climate change impacts are associated with the hazard.

Change of Vulnerability Since the 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also established using RSMeans 2019 building valuations that estimated replacement cost value for each building in the inventory. Additionally, a critical facility dataset was provided from the county. Overall, exposure and vulnerability of the entire county to a nuclear event will continue.



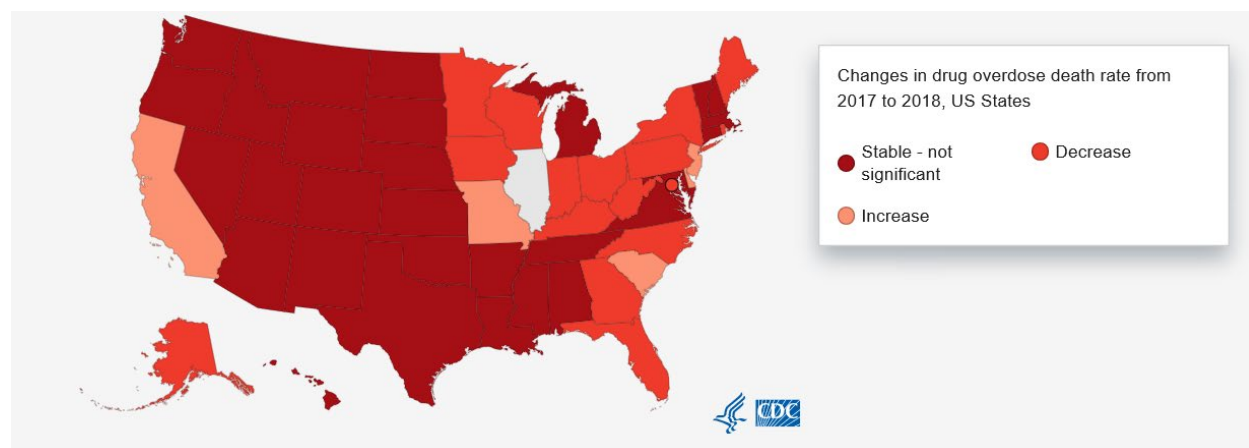
4.3.11 Opioid Addiction Response

Pennsylvania is in the midst of an unprecedented epidemic of drug abuse and drug-related overdose deaths impacting every corner of the state and all of its residents. In 2018, a total of 4,491 drug overdose-related deaths occurred in Pennsylvania (U.S. Drug Enforcement Administration [DEA] 2018). In 2018, Pennsylvania had the third highest rate of drug overdose deaths in the country (VandePol 2019). In 2018, 111 accidental drug and alcohol overdose-related deaths occurred within Chester County (Overdose Prevention Taskforce). In addition to the significant number of drug-overdose deaths, thousands more County residents are affected by addiction, either personally, or through family, friends, and loved ones.

The rates of drug overdose deaths are continuing to increase. In the United States in 2017, the age-adjusted rate of drug overdose deaths (44.3 per 100,000) was more than three times the rate in 1999 (Hedegaard et al. 2018). In Chester County, the annual drug overdose death rate per 100,000 people in 2018 was 21 (DEA 2018).

Significant increases in drug overdose death rates from 2017 to 2018 were seen in California, Virginia, Missouri, and Delaware. Death rates have been stable in the majority of the United States some states reporting a decrease, including Pennsylvania. (highlighted on Figure 4.3.11-1) (Centers for Disease Control and Prevention [CDC] 2019).

Figure 4.3.11-1. Statistically Significant Drug Overdose Death Rate Increase and Decrease from 2017 to 2018



Source: Centers for Disease Control and Prevention (CDC) 2019

In 2017, the U.S. Drug Enforcement Administration (DEA) Philadelphia Division and the University of Pittsburgh prepared a document titled, “Analysis of Overdose Deaths in Pennsylvania, 2016” to assist law enforcement’s efforts to identify and combat drug suppliers, and ultimately drug-abuse and related overdoses (DEA Philadelphia Division 2017). The drugs included in the analysis (listed in Table 4.3.11-1) were selected based on (1) law enforcement intelligence regarding frequency of abuse and diversion, as well as (2) the most common drugs present in drug-related overdose deaths according to national public safety and public health sources.

For the purpose of this Hazard Mitigation Plan (HMP) update and as identified by the Steering Committee, the drugs included in Table 4.3.11-1 below will be discussed in further detail in this section. This section also describes the location and extent, range of magnitude, past occurrence, future occurrence, and vulnerability assessment for the opioid addiction hazard for the Chester County HMP.



Table 4.3.11-1. Drugs Included in Analysis of Drug-Related Overdose Deaths, Pennsylvania, 2017

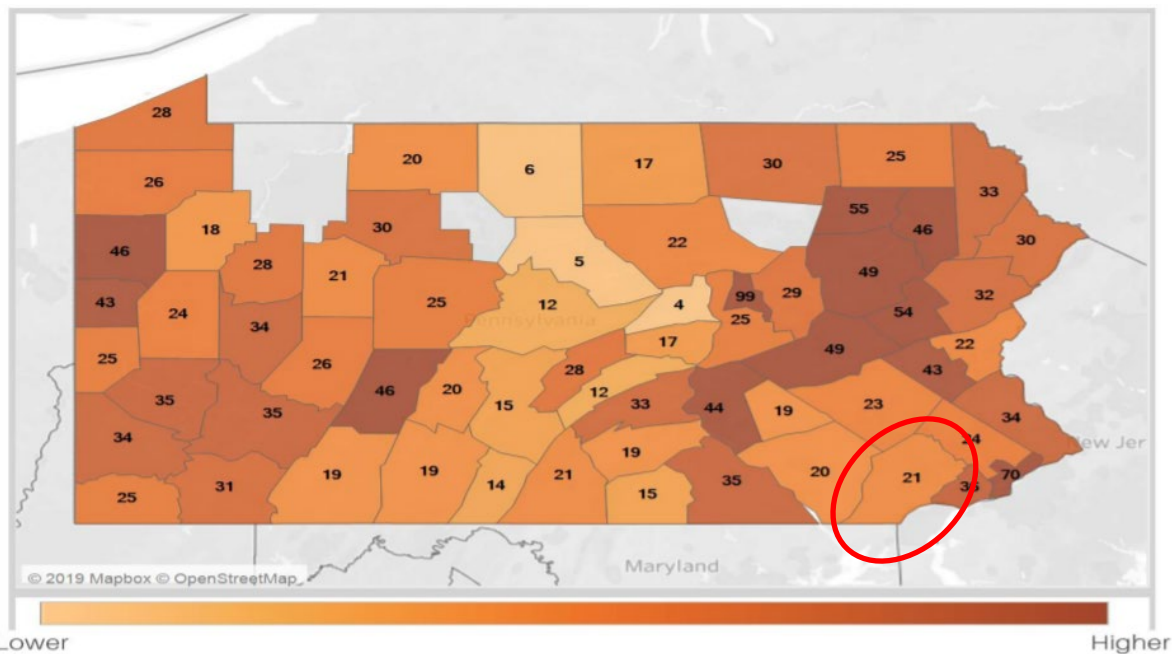
Drug Category	Substances Included in Analysis		
Benzodiazepines	Alprazolam Chlordiazepoxide Clonazepam Delorazepam	Diazepam Estazolam Flurazepam Lorazepam	Midazolam® Oxazepam Temazepam
Cocaine			
Fentanyl/Fentanyl-Related Substances (FRS)/Non-Prescription Synthetic Opioids (NPSO)	3-Methylfentanyl 4-Methoxy-Butyryl Fentanyl Acetyl Fentanyl Acryl Fentanyl	Carfentanil Fentanyl Fluorobutyrfentanyl Fluorofentanyl	Furanyl Fentanyl Para-Fluoro-Isobutyryl Fentanyl/FIBF Sufentanil U-47700
Heroin			
Other Illicit Drugs	Lysergic Acid Diethylamid (LSD) Methylenedioxy-amphetamine (MDA) 3,4-Methylenedioxymethamphetamine (MDMA)	Methamphetamine Phencyclidine (PCP)	
Prescription Opioids	Hydrocodone Hydromorphone Meperidine	Morphine Oxycodone Oxymorphone	Tapentadol Tramadol

Source: DEA Philadelphia Field Division 2017

4.3.11.1 Location and Extent

The number of overdoses within Chester County have decreased between 2015 to 2019. The number of opioid overdoses peaked in 2017 with 153 overdoses. The number of reported opioid overdoses decreased from 2017 to 2018 from 153 to 118 overdoses. The number of opioid overdoses also decreased from 2018 to 2019 from 118 to 105 (Overdose Free PA 2020). In 2019, Chester County had a rate of 19.4 drug-related overdose deaths per 100,000 people.

Figure 4.3.11-2. Rate of Drug-Related Overdose Deaths per 100,000 people in Pennsylvania Counties, 2018



Source: Pennsylvania Coroner/Medical Examiner Data 2018
 Note: The red oval indicates the location of Chester County.





Figure 4.3.11-3 shows the most commonly identified drug category in toxicology reports in Pennsylvania and indicates that the most frequently reported drug category in Pennsylvania was fentanyl, followed by heroin in 2017 and 2018.

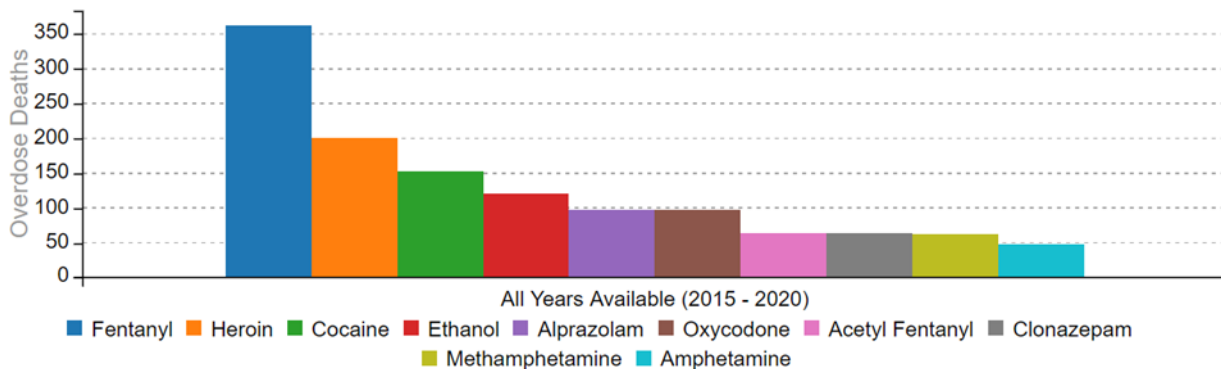
Figure 4.3.11-3. Frequently of Drug Categories in Drug-Related Overdose Deaths, Pennsylvania 2017-2018

Drug Category	Percent Reported Among 2018 Decedents	Percent Reported Among 2017 Decedents
Fentanyl	70%	67%
Heroin	35%	38%
Cocaine	33%	32%
Benzodiazepines	28%	31%
FRSs & NPSOs	23%	18%
Ethanol	18%	19%
Prescription Opioids	18%	20%
Other Illicit Drugs	14%	11%

Source: Pennsylvania Coroner/Medical Examiner Data 2018

Figure 4.3.11-4 shows the top 10 drugs present in 2015-2020 drug-related overdose deaths for Chester County. The figure shows that fentanyl caused the highest amount of drug-related overdose deaths in the county, followed by heroin.

Figure 4.3.11-4. Top 10 Drugs Present in 2015-2020 Drug-Related Overdose Deaths, Chester County



Source: Overdose Free PA 2020

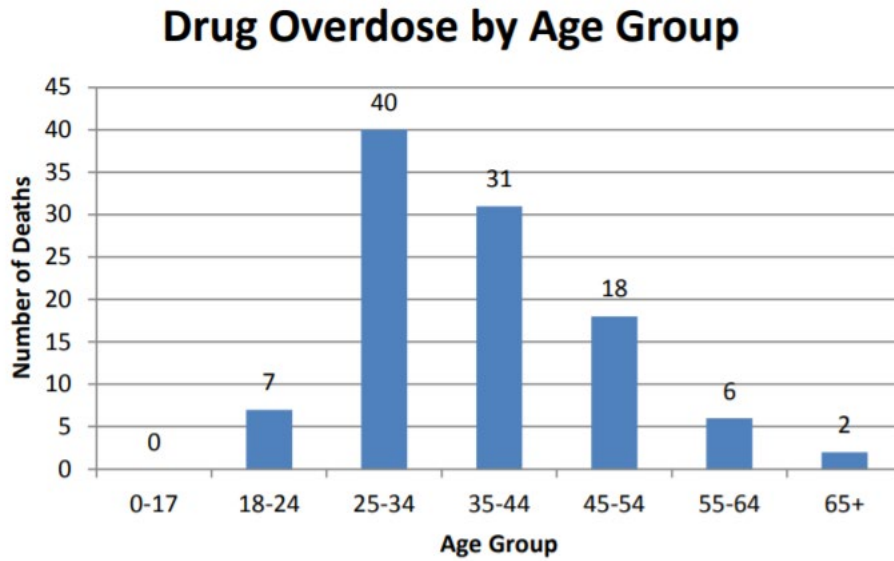
4.3.11.2 Range of Magnitude

Age

The 2019 Chester County Coroner’s Report indicated 105 opioid overdose deaths in 2019. The age group with the greatest overdoses was with ages 25-34, followed by ages 23-44. Males had a higher rate of overdose deaths, as shown in Figure 4.3.11-5 (Chester County 2019).



Figure 4.3.11-5. Age Distribution of Drug-Related Overdose Decedents, Pennsylvania, 2019



Source: Chester County Coroner’s Report 2019

Figure 4.3.11-6 shows that fentanyl was the most present drug category of all age groups except for the 0-14 age categories. Aside from fentanyl, heroin and cocaine was more common in younger and middle age groups, and prescription opioids were more common in the 75+ age group.

Figure 4.3.11-6. Drug Presence by Age Group Among Drug-Related Overdose Decedents, Pennsylvania, 2018

Drug Category	0-14	15-24	25-34	35-44	45-54	55-64	65-74	75+
Fentanyl		77%	81%	73%	62%	53%	52%	47%
Heroin		37%	41%	36%	32%	26%	30%	13%
Cocaine		23%	29%	34%	39%	34%	36%	13%
Benzodiazepines	17%	23%	26%	29%	29%	30%	26%	
Prescription Opioids	17%	15%	12%	17%	20%	25%	21%	33%
Ethanol	17%	11%	15%	18%	20%	24%	28%	27%
FRSs & NPSOs		28%	26%	25%	20%	15%	12%	27%
Other Illicit Drugs	33%	15%	16%	16%	14%	12%	7%	
	0%							100%

Source: Pennsylvania Coroner/Medical Examiner Data 2018

Gender

In 2016, benzodiazepines were the most used drug amongst females and fentanyl was the most common drug among males in the county. In 2017 and 2018, fentanyl was the most common drug with both male and females in the county.

The three most prevalent drug categories in toxicology reports in Chester County in 2018 for male victims of drug overdose were (in order) fentanyl with 81 percent, heroin with 43 percent, and cocaine and benzodiazepines at 30 percent. The three most prevalent drug categories for females in 2018 were (in order) fentanyl with 59 percent, cocaine with 41 percent, and prescription opioids with 38 percent (as listed in Figure 4.3.11-7).





Figure 4.3.11-7. Drug Presence among Drug-Related Overdose Decedents by Gender 2016-2018 in Chester County, Pennsylvania

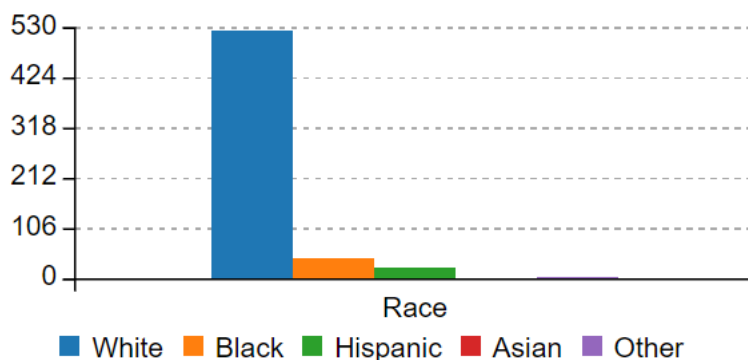
Drug Category	2016		2017		2018	
	Female	Male	Female	Male	Female	Male
Fentanyl	32%	47%	60%	78%	59%	81%
Heroin	18%	43%	25%	39%	28%	43%
Cocaine	18%	20%	20%	38%	41%	30%
Benzodiazepines	68%	41%	53%	27%	28%	30%
Rx Opioids	36%	33%	33%	14%	38%	25%
Ethanol	11%	13%	15%	18%	7%	27%
FRSs & NPSOs	4%	7%	25%	27%	31%	34%
Other Illicit Drugs	4%	10%	10%	22%	28%	18%

Source: *Overdose Free PA 2018*

Race and Ethnicity

In 2019, 526 decedents were identified as White (87 percent), 45 were identified as Black, 26 were identified as Hispanic, 6 were identified as Other Races, and less than 3 identified as Asian (shown in Figure 4.3.11-8). The racial breakdown for overdose deaths also coincides with the racial demographics in Chester County (Chester County 2018), as Whites comprise approximately 85.3 percent and Blacks comprise approximately 5.9 percent of the population. The ethnicity breakdown for overdose deaths also had a similar correlation as the percentage of the Hispanic population is 4.2 percent and Asian is 5.2 percent.

Figure 4.3.11-8. Race and Ethnicity of Drug-Related Overdose Decedents, Chester County 2019



Source: *Overdose Free PA 2019*

Figure 4.3.11-9 shows the breakdown of drug presence by race and ethnicity in Chester County from 2016-2018. For race and ethnicity categories, the two most prevalent drug categories in toxicology reports were fentanyl and heroin. Fentanyl, benzodiazepines, and heroin were most prevalent in Whites; fentanyl, heroin, and cocaine was most prevalent in Blacks and Hispanics; and fentanyl, prescription opioids, and benzodiazepines were most



prevalent in Other Races. There was a lesser difference by race and ethnicity for ethanol, FRSs, and NPSOs, and drug-related deaths for other illicit drugs were only prevalent for White and Hispanics.

Figure 4.3.11-9. Drug Presence by Race and Ethnicity Among Drug-Related Overdose Decedents, Chester County, Pennsylvania, 2016-2018

Drug Category	White	Black	Hispanic	Other
Fentanyl	66%	48%	76%	67%
Heroin	35%	57%	53%	
Cocaine	27%	52%	47%	
Benzodiazepines	38%	30%	12%	67%
Rx Opioids	26%	30%	18%	67%
Ethanol	16%	22%	29%	33%
FRSs & NPSOs	22%	30%	29%	
Other Illicit Drugs	18%		12%	

Source: *Overdose Free PA 2018*

4.3.11.3 Past Occurrence

Deaths from drug overdose are an increasing public health burden in the United States. A total of 67,367 drug overdose-related deaths were reported in 2018 (National Institute on Drug Abuse, n.d.). Table 4.3.11-2 shows the annual accidental drug-related deaths in Chester County from 2014 to 2019. Drug related deaths in Chester County increased from 2014 to 2017, but in 2018 the number of drug related deaths started to decrease (as summarized in Table 4.3.11-2).

Table 4.3.11-2. Accidental Drug-Related Deaths, Chester County, Pennsylvania 2014-2019

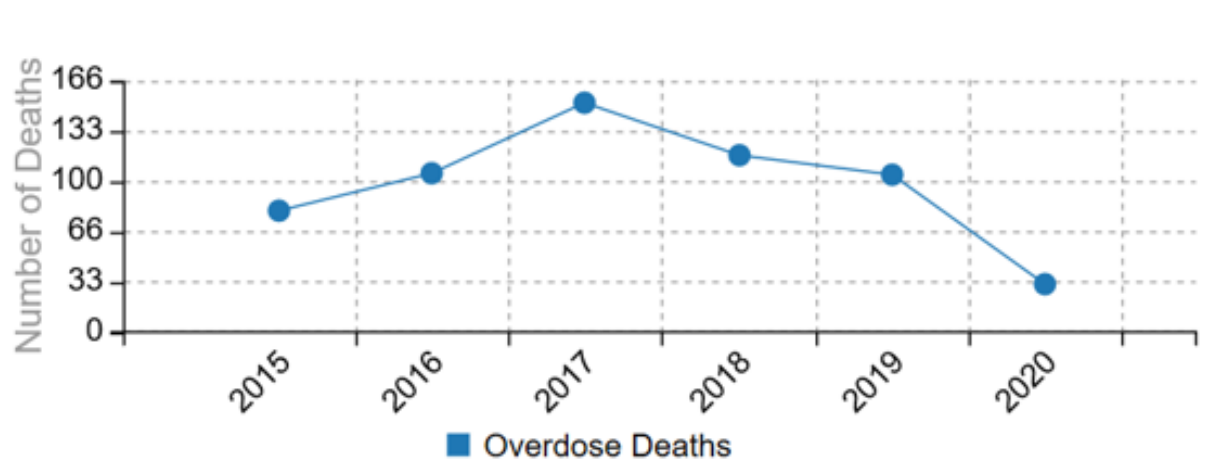
Year	Drug-Related Deaths	Population
2014	62	512,784
2015	68	515,939
2016	98	516,312
2017	144	519,293
2018	112	522,046
2019	104	524,989

Source: *Chester County PA Coroner's Office 2020*

Figure 4.3.11-10 shows the changes in overdose death rates from 2015 to 2020 for Chester County, Pennsylvania.



Figure 4.3.11-10. Annual Drug-Related Deaths, Chester County, 2015-2020



Source: *Overdose Free PA 2020*

Pennsylvania Governor Wolf declared the heroin and opioid epidemic a statewide disaster emergency on January 10, 2018. He has signed six renewals of the proclamation since then. This first-ever public health disaster declaration is meant to enhance state response, increase access to treatment, and save lives. A command center at the Pennsylvania Emergency Management Agency (PEMA) tracks progress and enhances coordination of health and public safety agencies. The declaration specifies 13 key initiatives organized by three areas of focus. The three areas of focus are listed below, with the associated key initiatives described beneath each area:

1. Enhancing Coordination and Data Collection to Bolster State and Local Response

- Establishes an Opioid Command Center located at PEMA, which will house the Unified Opioid Coordination Group that will meet weekly during the period of the disaster declaration to monitor implementation and progress of the initiatives in the declaration.
- Expands Access to Prescription Drug Monitoring Program (PDMP) to Other Commonwealth Entities for Clinical Decision-Making Purposes to improve treatment outcomes and better monitor compliance among prescribers. Since 2016, 90,000 physicians have conducted more than 1 million searches on the PDMP.
- Adds Overdoses and Neonatal Abstinence Syndrome (NAS) as Reportable Conditions in Title 28, Chapter 27 to the Pennsylvania Department of Health (DOH) to increase data collection and improve outcomes in both areas.
- Authorizes Emergency Purchase Under Procurement Code for Hotline Contract with Current Vendor, giving the Pennsylvania Department of Drug and Alcohol Program (DDAP) further emergency purchase authorization to allow the department to enter into a contract with the current drug and alcohol hotline vendor for uninterrupted services. To date, the 24/7 helpline, 1-800-662-HELP, has received more than 18,000 calls to connect those suffering from substance use disorder with treatment.

2. Improving Tools for Families, First Responders, and Others to Save Lives

- Enables emergency medical services providers to leave behind naloxone by amending the current standing order to include dispensing by first responders, including emergency medical technicians



(EMT). The existing naloxone standing order and funding for naloxone to first responders has allowed for more than 5,000 lives to be saved, helping connect sufferers to treatment for substance use disorder.

- Allows pharmacists to partner with other organizations to increase access to naloxone by waiving regulations to allow pharmacists to partner with other organizations, including prisons and treatment programs, to make naloxone available to at-risk individuals upon discharge from these facilities.
- Allows for the immediate temporary rescheduling of all fentanyl derivatives to align with the federal DEA schedule while working toward permanent rescheduling.
- Authorizes emergency purchasing under Section 516 of the Procurement Code to allow for an emergency contract to expand the advanced body scanner pilot program currently in place at Wernersville State Hospital that is used on re-entrants returning to the facility. This would prevent the program from lapsing.

3. Speeding Up and Expanding Access to Treatment

- Waive the face-to-face physician requirement for Narcotic Treatment Program (NTP) admissions to allow initial intake review by a certified registered nurse practitioner (CRNP) or physician assistant (PA) to expedite initial intakes and streamline coordination of care when an individual is most in need of immediate attention.
- Expand access to medication-assisted treatment (MAT) by waiving the regulatory provision to permit dosing at satellite facilities even while counseling remains at the base of the NTP. This allows more people to receive necessary treatments at the same location, increasing their access to care and chances for recovery.
- Waive annual licensing requirements for high-performing drug and alcohol treatment facilities to allow for bi-annual licensure process, which streamlines licensing functions and better allocates staff time. DDAP will request that facilities seek a waiver by filing exception requests to the annual licensing requirement.
- Waive the fee provided for in-statute for birth certificates for individuals who request a good-cause waiver by attesting that they are affected by opioid use disorder (OUD). This is of particular importance to individuals experiencing homelessness and other vulnerable populations who often cannot obtain copies of their birth certificates to access treatment and other benefits due to the financial requirements.
- Waive separate licensing requirements for hospitals and emergency departments to expand access to drug and alcohol treatment to allow physicians to administer short-term MAT consistent with DEA regulations without requiring separate notice to DDAP.

4.3.11.4 Future Occurrence

One of the most important components in reducing drug-related overdose deaths is to prevent initial drug use; as such, the impact of education and prevention strategies in use today will be shown in future years. The DEA Philadelphia Field Division will continue efforts, in conjunction with law enforcement and public health partners, to define and address the factors impacting availability and abuse of illicit drugs and diverted pharmaceuticals in Pennsylvania, which will ultimately impact the number of overdose deaths.



As evidenced by the upward trajectory of drug-related overdose deaths over the past several years throughout Chester County, Pennsylvania, and United States, the drug overdose hazard is likely to continue if something is not done. A crisis exists among law enforcement, public health entities, and educators to address drug availability, drug treatment, and drug education.

The identified hazards of concern for Chester County were ranked for relative risk in Section 4.4 of this plan. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records, the probability of occurrence for drug overdose events in Chester County is considered *highly likely*. Section 4.4 provides further information on PEMA’s risk factor methodology and the risk factors used to determine each hazard’s risk rank.

4.3.11.5 Vulnerability Assessment

To understand risk, a community must evaluate the assets that are exposed and potentially vulnerable to the identified hazard. The following sections evaluate and estimate the potential impact of drug overdose deaths on Chester County, including:

- Overview of vulnerability
- Impact on (1) life, health, and safety; (2) general building stock and critical facilities; (3) economy; (4) the environment; and (6) future growth and development
- Effects of climate change on vulnerability
- Further data collections that will assist understanding of this hazard over time

Overview of Vulnerability

This section is being added as an introductory representation, with hopes that future HMP updates will include more enhanced data for Chester County, as well as successful mitigation actions. At this time, available data support the need to create awareness and provide education to Chester County residents regarding this hazard of concern.

Impact on Life, Health, and Safety

The entire population of Chester County is vulnerable to opioid overdose. According to the 2014-2018 American Community Survey 5-Year Estimates, Chester County’s population was 522,046. The rates of drug overdose deaths are continuing to increase. According to CDC, in 2017, Pennsylvania had one of the top 3 highest observed drug overdose death rates in the country. As discussed above, Chester County drug overdose death rate per 100,000 people was 22 in 2018 (DEA Philadelphia Field Division 2017). Chester County Department Emergency Services has reported an increase of methamphetamine and a surge in overdoses has impacted first responders due to responding to an increase of overdose calls.

Impact on General Building Stock and Critical Facilities

No structures are anticipated to be affected directly by drug overdose deaths.

Impact on the Economy

The impact the drug overdose hazard has on the economy and estimated dollar losses are difficult to measure and quantify.

Impact on the Environment

As discussed in the 2018 Pennsylvania State HMP, fentanyl and fentanyl-related substances are hazardous materials and should be treated as such. Contact with fentanyl can impact first responders and family and friends



of opioid users. Depending on the potency of the drug, it can take as little as the equivalent of a few grams to cause health complications (DEA 2017).

According to a recent study, environmental scientists at the Cary Institute of New York found traces of opioids and other drugs in streams, rivers, and lakes. These traces came from human urine and feces, and medications that have been flushed down the toilet. However, the ecological and environmental impacts are unknown. The U.S. Environmental Protection Agency (EPA) suggests while the risks of pharmaceuticals found in wastewater, ambient water, and drinking water is low, further research is needed (EPA 2014).

Future Growth and Development

Areas targeted for potential future growth and development in the next 5 to 10 years have been identified across Chester County (further discussed in Section 2.4 of this HMP). Any areas of growth could be potentially impacted by the drug overdose hazard because the entire county is exposed and potentially vulnerable.

Effect of Climate Change on Vulnerability

Climate change is not anticipated to affect vulnerability associated with drug overdose deaths.

Additional Data and Next Steps

For the HMP update, any additional information regarding localized concerns and past impacts will be collected and analyzed. These data will be developed to support future revisions to the plan. Future mitigation efforts could include building on existing state, county, and local efforts.



4.3.12 Pandemic and Infectious Disease

Pandemics are large-scale disease outbreaks, defined by the way in which a disease spreads rather than the number of fatalities associated with it. A pandemic outbreak has several recognizable characteristics, including rapid, large-scale (potentially global) spread causing (1) overloaded healthcare systems; (2) inadequate medical supplies; (3) medical supply shortages; and (4) a disrupted economy and society (Flu.gov 2015). Pandemics typically result from infectious diseases. An infectious disease, as defined by the World Health Organization (WHO), is caused by pathogenic organisms (e.g., bacteria, viruses, fungus, or parasites) that spread from one person to another, whether through direct or indirect contact. Zoonotic disease is a type of infectious disease that occurs when animals transmit a disease to humans (WHO 2015). Although any infectious disease can reach pandemic levels, the 2019 Coronavirus (COVID-19), is the current pandemic the United States is facing.

This section describes the location and extent, range of magnitude, past occurrence, future occurrence, and vulnerability assessment for the pandemic and infectious disease hazard for the Chester County Hazard Mitigation Plan (HMP).

4.3.12.1 Location and Extent

Pandemic events cover a wide geographic area and can affect large populations, which can include multiple countries or continents. Size and extent of an infected population depends on how easily the illness is spread, mode of transmission, and amount of contact between infected and uninfected individuals. Locations with higher-density populations are more susceptible to pandemic outbreaks, as the disease can be transmitted more easily. Additionally, vulnerable populations—especially the young and the elderly (who have weaker immune systems)—are at greater risk for both contracting a disease and suffering fatal or severe consequences. Flu most frequently spreads through the air or by touch; when an infected person coughs, infected droplets go into the air or onto their hands, facilitating transmission of the disease to other people (WHO 2015).

When a pandemic or disease outbreak occurs, WHO and other public health institutions begin tracking the disease outbreak, treatment, and more. The 2019 Coronavirus (COVID-19) is a global health threat and, as of the date of publication of this HMP update, continues to be a significant pandemic concern for American public health officials in the United States as well as the rest of the world. The Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) is actively involved in managing the outbreak and treatment of the disease.

The first human cases of COVID-19 were first reported by officials in Wuhan City, China, in December 2019. In the United States, community transmission of COVID-19 was first detected in February 2020. By mid-March, all 50 states and four U.S. territories had reported cases of COVID-19. As of January 29, 2021, a total of 25,615,268 cases and 431,619 deaths related to COVID-19 have been reported in the United States (CDC 2021). Chester County has had a total of 27,079 cases of COVID-19 and 657 deaths as of January 29, 2021 (CDC 2021).

In addition to COVID-19, Chester County is concerned about the possibility of a pandemic flu outbreak. Influenza viruses with the potential to reach pandemic levels include the avian influenza A (H5N1) and avian influenza H7N9 (CDC 2015). Several years ago, the swine influenza (H1N1) was of particular concern. H1N1 was first detected in people in the United States in April 2009. On June 11, 2009, WHO signaled that a pandemic of 2009 H1N1 flu was underway (CDC 2009).

4.3.12.2 Range of Magnitude

Severity of a pandemic disease depends on a number of factors, including the aggressiveness of the disease, ease of transmission, and factors associated with the impacted community (e.g., access to medical care, demographic



data, and population density). Advancements in medical technologies have greatly reduced the number of deaths caused by influenza, a disease most likely to reach pandemic scale in Pennsylvania. Consequently, global effects of various influenza outbreaks have declined over the past century. High-risk populations considered more vulnerable to various pandemic diseases are described in the vulnerability assessment presented in Section 4.3.12.5.

COVID-19 is currently the biggest pandemic threat to the county because (1) it is easily spreadable, (2) infected people can be asymptomatic, and (3) the virus is new and is not yet fully understood.

Pandemic flu should not be confused with seasonal flu. Seasonal flu is a less severe concern because of its regularity of occurrence and predictability. Table 4.3.12-1 lists key differences between pandemic and seasonal flu.

Table 4.3.12-1. Seasonal Flu vs. Pandemic Flu

Pandemic Flu	Seasonal Flu
Rarely happens (three times in 20 th century).	Happens annually and usually peaks in January or February.
People have little or no immunity because they have no previous exposure to the virus.	Sufferers usually have some immunity built up from previous exposure.
Healthy people may be at increased risk for serious complications.	Usually only people in vulnerable populations, not healthy adults, are at risk of serious complications.
Healthcare providers and hospitals may be overwhelmed.	Healthcare providers and hospitals can usually meet public and patient needs.
Vaccine probably would not be available in the early stages of a pandemic.	Vaccine is available for annual flu season.
Effective antivirals may be in limited supply	Adequate supplies of antivirals are usually available.
Number of deaths could be high (U.S. death toll during the 1918 pandemic was approximately 675,000).	Seasonal flu-associated deaths in the United States over 30 years ending in 2007 have ranged from about 3,000 per season to about 49,000 per season.
Symptoms may be more severe.	Symptoms include fever, cough, runny nose, and muscle pain.
May cause major impact on the general public, such as widespread travel restrictions and school or business closings.	Usually causes minor impact on the general public; some schools may close, and sick people are encouraged to stay home.
Potential for severe impact on domestic and world economy.	Manageable impact on domestic and world economy.

Source: Flu.gov 2015

Approximately 12,470 Americans died from H1N1 within a roughly 1-year period from April 2009 to April 2010 (CDC 2010). Between October 2014 and late May 2015, 6.4 percent of deaths were attributable to pneumonia and influenza—below the epidemic threshold of 6.6 percent (an epidemic occurs when the incidence rate exceeds the expected rate but is not at the magnitude of a pandemic) (CDC FluView 2016).

In 2014, CDC updated the Pandemic Intervals Framework (PIF), which describes the progression of an influenza pandemic using six intervals. The framework is used to guide planning for an influenza pandemic and provides recommendations for risk assessment, decision-making, and action in the United States. Descriptions of the CDC pandemic intervals are presented in Table 4.3.12-2.



Table 4.3.12-2. CDC Pandemic Intervals Framework

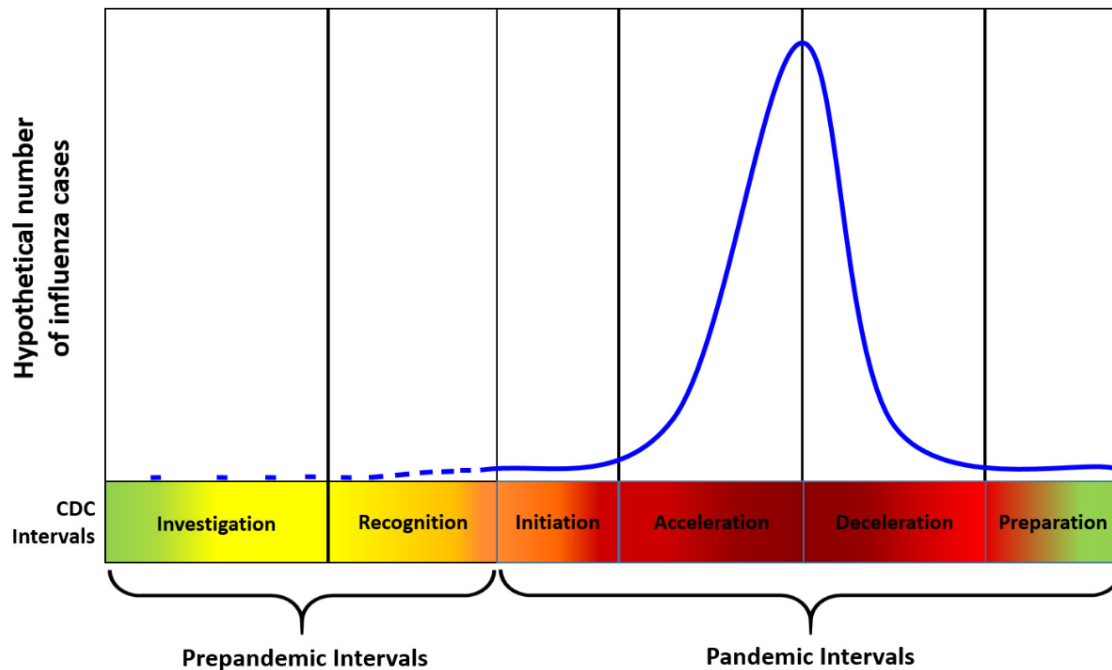
Interval	Description
Interval 1: Investigation of cases of novel influenza A virus infection in humans	When novel influenza A viruses are identified in people, public health actions focus on targeted monitoring and investigation. This can trigger a risk assessment of that virus with the Influenza Risk Assessment Tool (IRAT), which is used to evaluate whether the virus has the potential to cause a pandemic.
Interval 2: Recognition of increased potential for ongoing transmission of a novel influenza A virus	When increasing numbers of human cases of novel influenza A illness are identified and the virus has the potential to spread from person to person, public health actions focus on control of the outbreak, including treatment of sick persons.
Interval 3: Initiation of a pandemic wave	A pandemic occurs when people are easily infected with a novel influenza A virus that has the ability to spread in a sustained manner from person to person.
Interval 4: Acceleration of a pandemic wave	The acceleration (or “speeding up”) is the upward epidemiological curve as the new virus infects susceptible people. Public health actions at this time may focus on the use of appropriate non-pharmaceutical interventions in the community (e.g., school and child-care facility closures, social distancing), as well the use of medications (e.g., antivirals) and vaccines, if available. These actions combined can reduce the spread of the disease and prevent illness or death.
Interval 5: Deceleration of a pandemic wave	The deceleration (or “slowing down”) happens when the number of reported pandemic influenza cases consistently decreases in the United States. Public health actions include continued vaccination, monitoring of pandemic influenza A virus circulation and illness, and reducing the use of non-pharmaceutical interventions in the community (e.g., school closures).
Interval 6: Preparation for future pandemic waves	When pandemic influenza has subsided, public health actions include continued monitoring of pandemic influenza A virus activity and preparing for potential additional waves of infection. It is possible that a second pandemic wave could have higher severity than the initial wave. An influenza pandemic is declared “ended” when enough data show that the reported cases of influenza virus worldwide are similar to cases of seasonal influenza virus in the way they spread and the severity of the illness they can cause.

Source: CDC 2014

Conclusion of Interval 6 leads to the post-peak period, where the pandemic is declared “ended” when enough data show that the influenza virus, worldwide, presents similar to a seasonal influenza virus. Despite a decrease in activity, countries still must be prepared for additional waves of the pandemic. Pandemic waves can be separated by a period of months leading to a long recovery time, to guarantee entry of the pandemic into the post-pandemic interval (CDC 2014). Figure 4.3.12-1 illustrates the six intervals of pandemic influenza described by CDC.



Figure 4.3.12-1. Preparedness and Response Framework for Novel Influenza A Virus Pandemics



Source: CDC 2014

COVID-19 Symptoms and Prevention Measures

Symptoms may appear 2-14 days after exposure to the virus. Symptoms of COVID-19 include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea. Anyone can have mild to severe symptoms but older adults and people who have severe underlying medical conditions seem to be at higher risk for developing more serious complications. Ways to prevent the spread of COVID-19 include social distancing, staying home whenever possible and avoiding crowds, taking care of personal health (by resting and staying hydrated), staying in touch with family doctor or healthcare professional, and avoiding public transportation. COVID-19 has caused a major impact on the general public, such as widespread travel restrictions and school and business closings. COVID-19 has the potential for severe impact on domestic and world economy (CDC 2020). On December 11, 2020, the U.S. Food and Drug Administration issued the first emergency use authorization for a vaccine for the prevention of COVID-19 in individuals 16 years of age and older. The emergency authorization allows the Pfizer-BioNech COVID-19 vaccine to be distributed in the United States (U.S. Food and Drug Administration 2020).

4.3.12.3 Past Occurrence

Several pandemic influenza outbreaks have occurred worldwide over the past 100 years, as listed in Table 4.3.12-3. Deaths occurred in the United States as a result of Spanish Flu, Asian flu, and Hong Kong Flu outbreaks. In the United States, about 675,000 people died while 22 million caught the Spanish Flu (1918-1920). Pennsylvania, one of the states that was hit the hardest, faced over 60,000 deaths (Shetty 2018). Most deaths resulting from Asian flu occurred between September 1957 and March 1958; within the United States, approximately 70,000 people died, and approximately 15 percent of the population of Pennsylvania was affected. The first cases of Hong Kong Flu in the United States were detected in September 1968, with deaths peaking



between December 1968 and January 1969 (Global Security 2009). As of August 2010, H1N1 was in a post-pandemic period. The COVID-19 virus has no “past occurrence” data, as it was first reported in 2019.

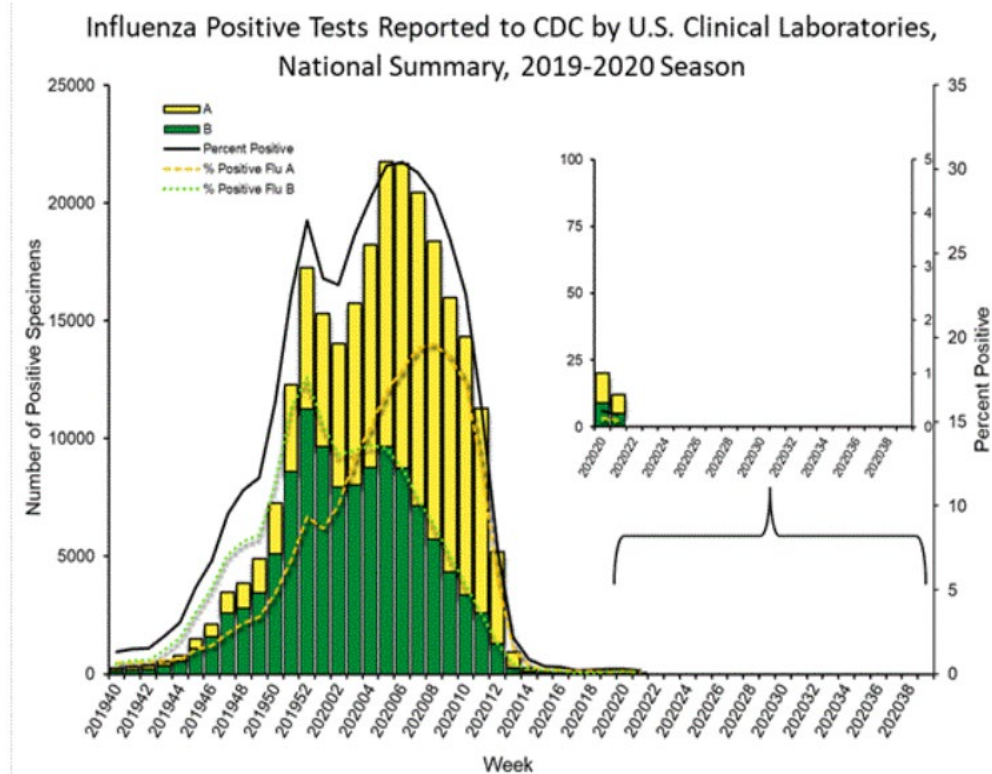
Table 4.3.12-3. Previous Pandemic Outbreaks

Date	Pandemic/Subtype	Worldwide Deaths (Approx.)
1918-1920	Spanish Flu/H1N1	50 Million
1957-1958	Asian Flu/H2N2	1.5-2 Million
1968-1969	Hong Kong Flu/H3N2	1 Million
2009-2010	Swine Flu/H1N1	> 18,000

Source: CDC 2010

Epidemiologists and public health officials consistently track the rate of influenza or influenza-like illnesses (ILI) to monitor potential pandemic threats. This also allows them to provide annual data on ILI seasonal outbreaks. Figure 4.3.12-2 below shows the national number of cases of ILI during the 2019-2020 season, distinguishing each type of ILI (Influenza A and Influenza B) with a unique color.

Figure 4.3.12-2. ILI Cases in the United States, 2019-2020 Season



Source: CDC Weekly Flu 2020

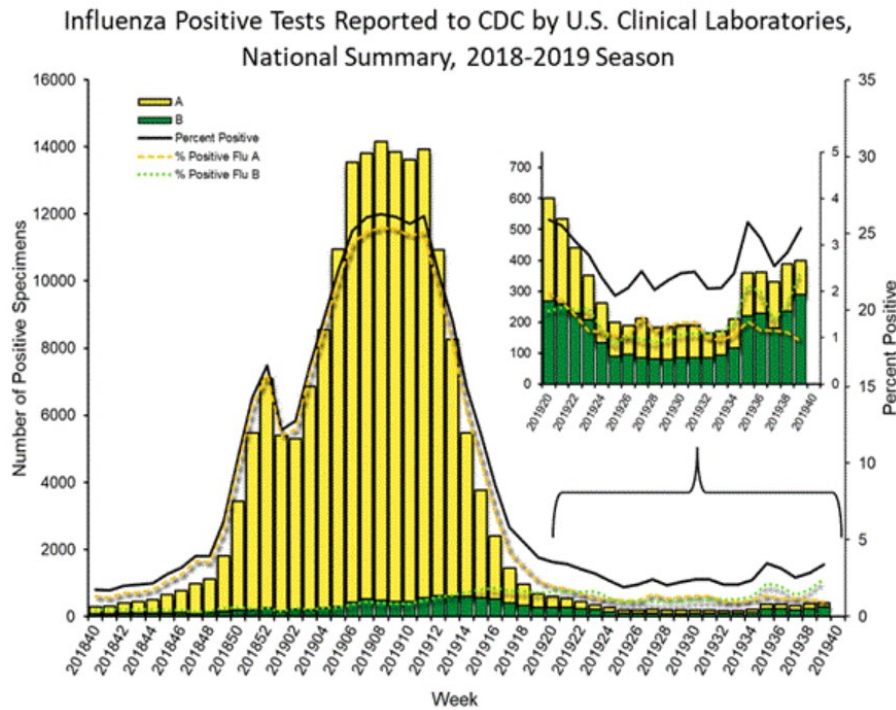
In the mid-Atlantic region, which includes the State of Pennsylvania and Chester County, the following number of positive ILI tests were reported:

- A – 2,494
- B – 938
- H3N2v – 0 (CDC Weekly Flu, 2020)



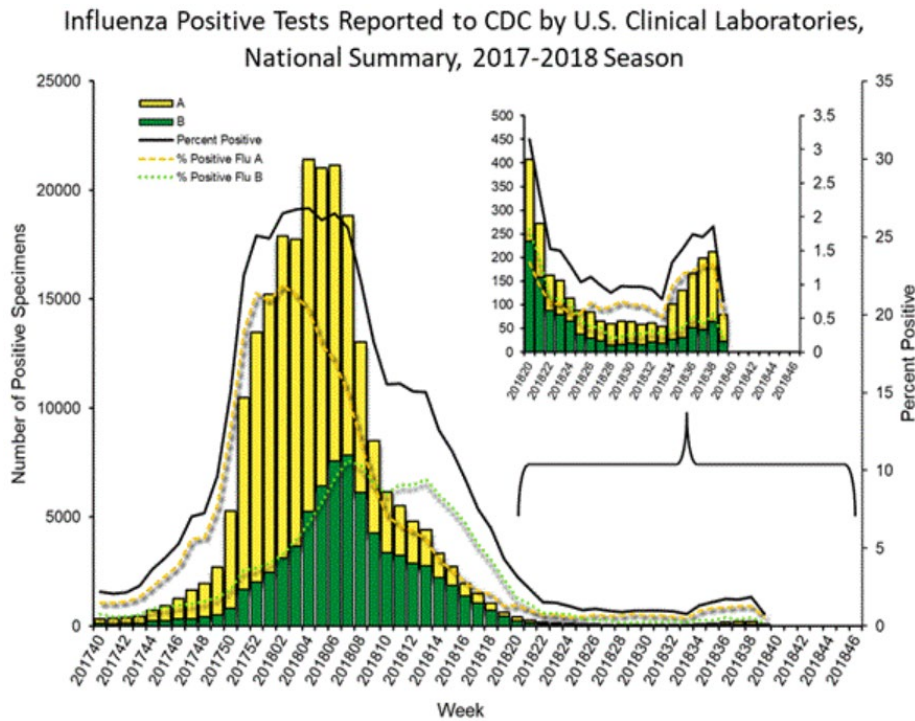
Figure 4.3.12-3 and Figure 4.3.12-4 below show the number of positive cases for Influenza A and B over the 2017-2018 and 2018-2019 seasons.

Figure 4.3.12-3. ILI Cases in the United States, 2018-2019 Season



Source: CDC Weekly Flu 2020

Figure 4.3.12-4. ILI Cases in the United States, 2017-2018 Season



Source: CDC Weekly Flu 2020



4.3.12.4 Future Occurrence

Based on historical data, Chester County is expected to undergo pandemic influenza outbreaks every 11 to 41 years. Because COVID-19 is so new, the likelihood of how often it will occur is unknown. Exact timing of pandemic influenza outbreaks is unpredictable, and complete avoidance is impossible (U.S. Department of Health and Human Services [DHHS] 2009). Future occurrence is considered possible, as defined by the Risk Factor Methodology probability criteria (shown in Table 4.4-1 in Section 4.4 of this HMP).

4.3.12.5 Vulnerability Assessment

Depending on the characteristics of the disease or virus, certain population groups can be at higher risk of infection than others. About 60 percent of hospitalizations related to seasonal flu and 90 percent of flu-related deaths occur among people 65 and older. However, during the H1N1 pandemic, 90 percent of hospitalizations and 87 percent of H1N1-related deaths occurred in people younger than 65. As with seasonal flu, people with underlying health conditions face a much higher probability of contracting H1N1. Schools, convalescent centers, and other institutions are highly conducive to faster transmission of pandemic diseases (CDC 2010).

Table 4.3.12-4 shows the demographic change in children and the elderly from 2000 through 2019 in Chester County. Chester County has seen population increases in both individuals under 65 years of age as well as individuals over 65 years of age. Therefore, Chester County is more vulnerable to both seasonal influenza and pandemic influenza, such as the H1N1 pandemic.

Pandemics and infectious diseases can also affect first responders in many ways including the need for more personal protection equipment to keep them safe and able to perform job duties. There is also an added layer of complexity to triaging patient care and a higher patient volume during pandemics.

Table 4.3.12-4. Demographic Trends for Vulnerable Populations

Vulnerable Population	2000 Census	2010 Census	2018 Census Estimate	2000 to 2018 Change
Under 18 years	113,582	123,393	119,549	5,967
Under 65 years	765,648	451,731	985,758	220,110
65 years and over	46,801	63,875	79,856	33,055

Source: U.S. Census Bureau 2020



4.3.13 Radon Exposure

Radon is a natural gas that cannot be seen, smelled, or tasted. It is a noble gas that originates from natural radioactive decay of uranium and thorium in rocks, soil, and groundwater. Radon is a large component of the natural radiation to which humans are exposed and can pose a serious threat to public health when it accumulates in poorly ventilated residential and occupation settings. According to the U.S. Environmental Protection Agency (EPA), radon causes more than 20,000 lung cancer deaths per year, second only to smoking as the leading cause of lung cancer (EPA 2016). An estimated 40 percent of the homes in Pennsylvania are believed to have elevated radon levels (Pennsylvania Department of Environmental Protection [PADEP] 2017c).

This section describes the location and extent, range of magnitude, past occurrence, future occurrence, and vulnerability assessment for the radon exposure hazard for the Chester County Hazard Mitigation Plan (HMP).

4.3.13.1 Location and Extent

Radioactivity caused by airborne radon has been recognized for many years as an important component in the natural background radioactivity exposure of humans. However, it was not until the 1980s that the wide geographic distribution of elevated radon levels in houses and the possibility of extremely high radon concentrations in houses were recognized. In 1984, routine monitoring of employees leaving the Limerick nuclear power plant near Reading, PA, showed that readings from one employee frequently exceeded expected radiation levels, yet only natural, non-fission-product radioactivity was detected on him. Radon levels in his home were detected around 2,500 picoCuries per liter (pCi/L), much higher than the 4 pCi/L guideline set by EPA or even the 67 pCi/L limit for uranium miners. As a result of this event, the Reading Prong section of Pennsylvania where this person lived became the focus of the first large-scale radon scare in the world.

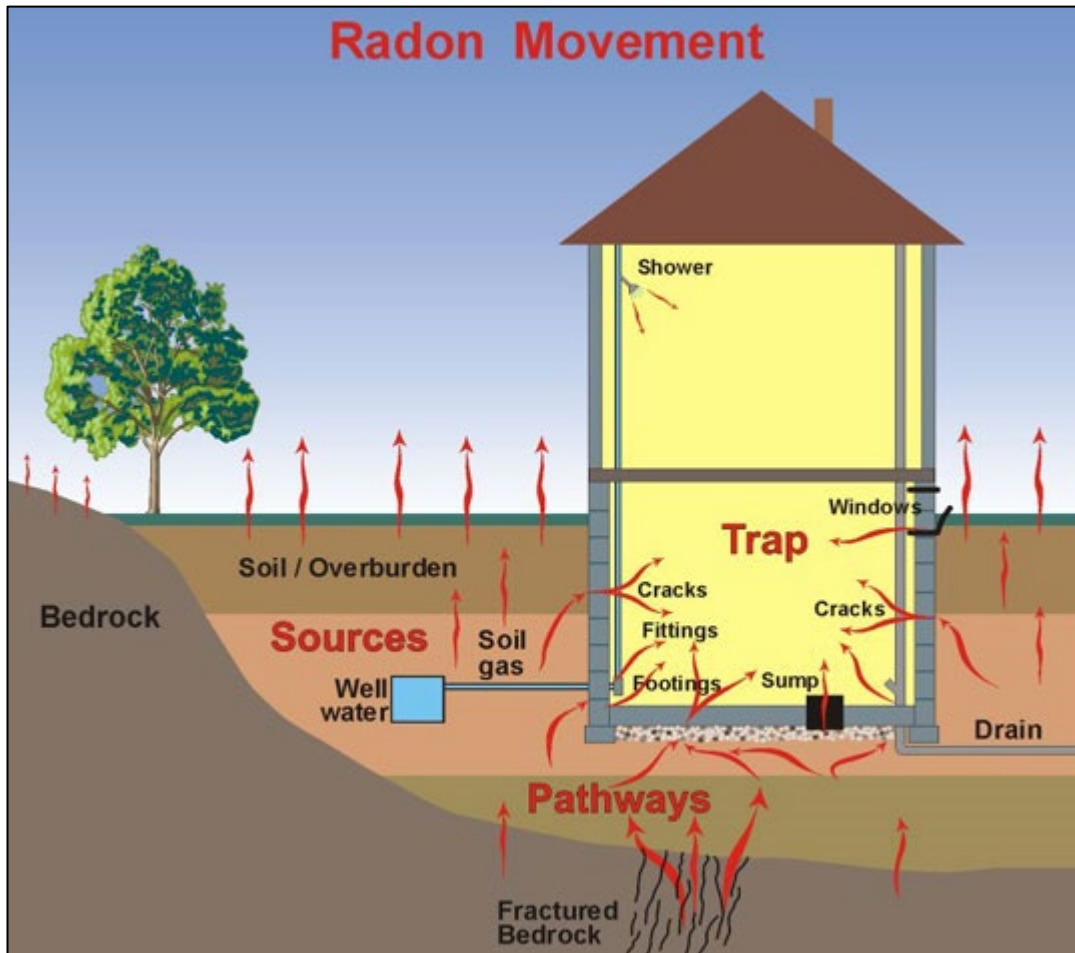
Radon (Rn-222), which has a half-life of 3.8 days, is a widespread hazard. The distribution of radon correlates with the distribution of radium (Ra-226), its immediate radioactive parent, and with uranium, its original ancestor. Because of the short half-life of radon, the distance radon atoms travel from their parent before they decay is generally limited to extents of feet or tens of feet. The following three sources of radon in residences are now recognized:

- Radon in soil air flows into the house.
- Radon dissolved in water from private wells and exsolved during water usage; this source is rarely a problem in Pennsylvania.
- Radon emanates from uranium-rich building materials (such as concrete blocks or gypsum wallboard); this source also is not known to be a problem in Pennsylvania (Pennsylvania Emergency Management Agency [PEMA] 2013).

Figure 4.3.13-1 illustrates radon entry points into a home.



Figure 4.3.13-1. Sketch of Radon Entry Points into a House

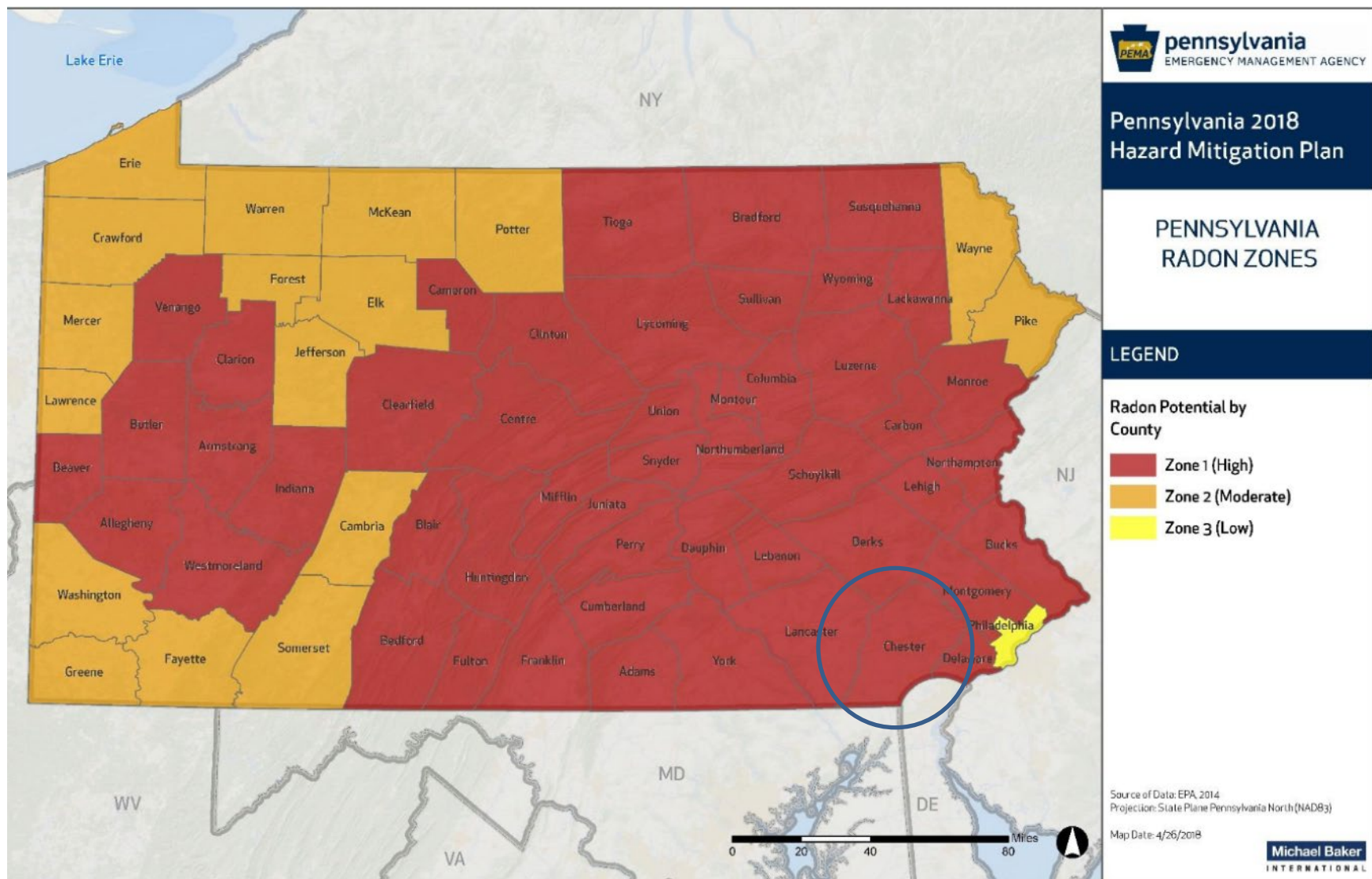


Source: PEMA 2013

Each county in Pennsylvania is classified as having a low, moderate, or high radon hazard potential. A majority of counties across the Commonwealth, particularly counties in eastern Pennsylvania, have a high hazard potential. Western Pennsylvania, however, is not completely immune from the threat of radon, as high potential for radon exposure exists within nine western counties. The average indoor radon screening level within high-exposure counties exceeds 4 pCi/L. Chester County is in Zone 1 – High Radon Potential, as noted on Figure 4.3.13-2 below.



Figure 4.3.13-2. Radon Hazard Zones in Pennsylvania



Source: EPA 2014 (Chester County is identified by the blue circle.)





High radon levels were initially thought to be exacerbated in tightly sealed houses, although it is now recognized that rates of airflow into and out of houses, plus the location of air inflow and the radon content of air in the surrounding soil, are key factors affecting radon concentrations. Air must be drawn into a house to compensate for outflows of air from the house caused by a furnace, fan, thermal “chimney” effect, or wind effects. If the upper part of the house is tight enough to impede influx of outdoor air (radon concentration generally below 0.1 pCi/L), an appreciable fraction of the air may be drawn in from the soil or fractured bedrock through the foundation and slab beneath the house, or through cracks and openings for pipes, sumps, and similar features. Soil gas typically contains from a few hundred to a few thousand pCi/L of radon; therefore, even a small rate of soil gas inflow can lead to elevated radon concentrations in a house.

Radon concentration in soil gas depends on a number of soil properties, the importance of which are still being evaluated. In general, 10 to 50 percent of newly formed radon atoms escape the host mineral of their parent radium and gain access to the air-filled pore space. The radon content of soil gas clearly tends to be higher in soils containing higher levels of radium and uranium, especially if the radium occupies a site on or near the surface of a grain from which the radon can easily escape. The amount of pore space in the soil and its permeability for airflow, including cracks and channels, are important factors determining radon concentration in soil gas and its rate of flow into a house. Soil depth and moisture content, mineral host and form for radium, and other soil properties may also be important. Fractured zones may supply air having radon concentrations similar to those in deep soil for houses built on bedrock.

Areas where houses have high levels of radon can be divided into the following three groups in terms of uranium content in rock and soil:

- Areas of very elevated uranium content (above 50 parts per million [ppm]) around uranium deposits and prospects: Although very high levels of radon can occur in these areas, the hazard normally is restricted to within a few hundred feet of the deposit. In Pennsylvania, these localities occupy an insignificant area.
- Areas of common rocks having higher than average uranium content (5 to 50 ppm): In Pennsylvania, these rock types include granitic and felsic alkali igneous rocks and black shales. High uranium values in rock or soil and high radon levels in houses in the Reading Prong are associated with Precambrian granitic gneisses commonly containing 10 to 20 ppm uranium, but locally containing more than 500 ppm uranium. Elevated uranium occurs in black shales of the Devonian Marcellus Formation and possibly the Ordovician Martinsburg Formation in Pennsylvania. High radon values are locally present in areas underlain by these formations.
- Areas of soil or bedrock that have normal uranium content but properties that promote high radon levels in houses: This group is not completely understood at present. Relatively high soil permeability can lead to high radon concentrations; the clearest examples of this scenario are houses built on glacial eskers. Limestone-dolomite soils also appear to be predisposed for high radon levels in houses, perhaps because of the presence of deep clay-rich residuum where radium is concentrated by weathering on iron oxide or clay surfaces, coupled with moderate porosity and permeability. The importance of carbonate soils is indicated by exceedance of 4 pCi/L in 93 percent of a sample of houses built on limestone-dolomite soils near State College, Centre County, and exceedance of 20 pCi/L in 21 percent of that sample of houses, even though uranium levels in the underlying bedrock are all within the normal radon range of 0.5 to 5 ppm (PEMA 2013).

According to the Pennsylvania State HMP, radon tends to exist as a gas or as a dissolved atomic component in groundwater. The most problematic source of radon in houses in Pennsylvania soil gas that flows into the house. Even a small rate of soil gas inflow can lead to elevated radon concentrations in a house. The State HMP indicates that current data on abundance and distribution of radon in Pennsylvania homes are incomplete and biased, but the plan identifies general patterns (PEMA 2013).



4.3.13.2 Range of Magnitude

Exposure to radon is the second-leading cause of lung cancer after smoking, and the leading cause of lung cancer among non-smokers. As stated earlier, radon is responsible for more than 20,000 lung cancer deaths every year. Lung cancer is the only known effect on human health from exposure to radon in air and, thus far, no evidence indicates that children are at greater risk of lung cancer than adults (EPA 2016). The main hazard is actually from the radon-daughter products (polonium-218, lead-214, bismuth-214), which may become attached to lung tissue and induce lung cancer by their radioactive decay. Table 4.3.13-1 lists (1) cancer risks from exposure to radon at various levels for smokers and non-smokers, (2) lung cancer risks from radon exposure compared to cancer risks from other hazards for smokers and non-smokers, and (3) action thresholds.

Table 4.3.13-1. Radon Risk for Smokers and Non-Smokers

Radon Level (picoCuries per liter [pCi/L])	Cancer Rate per 1,000 People with Lifetime Exposure	Comparative Cancer Risk of Radon Exposure	ACTION THRESHOLD
SMOKERS			
20	About 260 people could get lung cancer	250 times the risk of drowning	Fix structure
10	About 150 people could get lung cancer	200 times the risk of dying in a home fire	
8	About 120 people could get lung cancer	30 times the risk of dying in a fall	
4	About 62 people could get lung cancer	5 times the risk of dying in a car crash	
2	About 32 people could get lung cancer	6 times the risk of dying from poison	Consider fixing structure between 2 and 4 pCi/L
1.3	About 20 people could get lung cancer	(Average indoor radon level)	Reducing radon levels below 2 pCi/L is difficult
0.4	About 3 people could get lung cancer	(Average outdoor radon level)	
NON-SMOKERS			
20	About 36 people could get lung cancer	35 times the risk of drowning	Fix structure
10	About 18 people could get lung cancer	20 times the risk of dying in a home fire	
8	About 15 people could get lung cancer	4 times the risk of dying in a fall	
4	About 7 people could get lung cancer	The risk of dying in a car crash	
2	About 4 people could get lung cancer	The risk of dying from poison	Consider fixing structure between 2 and 4 pCi/L
1.3	About 2 people could get lung cancer	(Average indoor radon level)	Reducing radon levels below 2pCi/L is difficult
0.4	-	(Average outdoor radon level)	
Note: Risk may be lower for former smokers. * Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003). ** Comparison data calculated using the Centers for Disease Control and Prevention’s 1999-2001 National Center for Injury Prevention and Control Reports.			

Source: EPA 2016

According to EPA, the average radon concentration in the indoor air in homes in the United States is about 1.3 pCi/L. EPA recommends that homes be repaired if the radon level is 4 pCi/L or more. However, EPA also



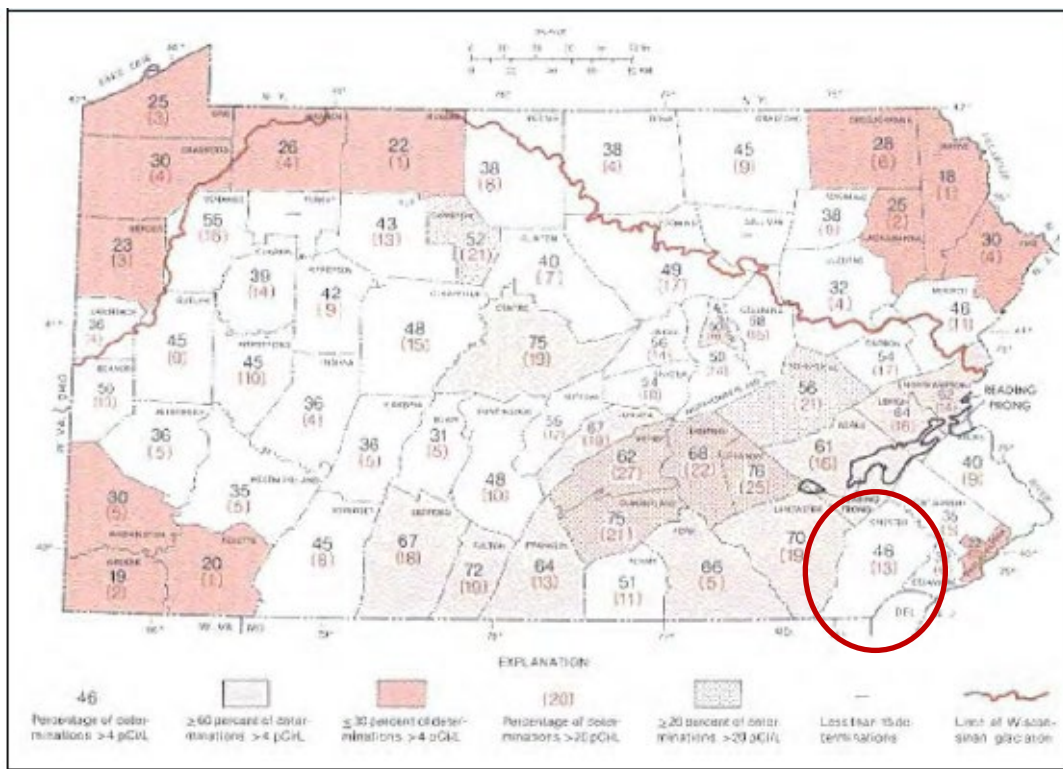
recommends that Americans consider fixing their home if radon levels are between 2 and 4 pCi/L because there is no known safe level of exposure to radon. As listed in Table 4.3.13-1, a smoker exposed to radon has a much higher risk of lung cancer.

The worst-case scenario for radon exposure would be caused by a large area of tightly sealed homes inducing high levels of exposure to residents over a prolonged period of time, without awareness of this by the residents. This worst-case scenario exposure then could lead to a large number of people contracting cancer attributed to the radon exposure (PEMA 2016). The most likely scenario is a single household exposed to a very low concentration of radon, with no adverse health effects.

4.3.13.3 Past Occurrence

Current data on abundance and distribution of radon in Pennsylvania houses are considered incomplete and potentially biased, but some general patterns are evident (as shown in Figure 4.3.13-3).

Figure 4.3.13-3. Percentage of Pennsylvania Homes with Radon Levels Exceeding 4 pCi/L



Source: PEMA 2013 (Chester County is identified by the red circle.)

PADEP Bureau of Radiation Protection (Bureau) provides homeowners with information on how to test for radon in their houses. If results of a test reported to the Bureau exceed 4 pCi/L, the Bureau works to help the homeowner repair the house so as to mitigate high radon levels. The total number of tests reported to the Bureau since 1990 and test results by zip code are accessible on the Bureau’s website. However, to best approximate the average for an area, this information is provided only if more than 30 tests within that area were reported.

The Bureau collected the sufficient number of radon results from residences in 36 zip codes within Chester County to allow them to report the findings (summarized in Table 4.3.13-2). PADEP does not publish results unless a zip code has had at least 30 tests conducted. PADEP only publishes the average and maximum results for a zip code; it does not offer a range of results for a zip code, municipality, or region. The PADEP Radon Division recommends that *all* homeowners test for radon, regardless of test results within their respective zip



codes. Despite a low average test result within a zip code, many homes in that zip code may have elevated radon levels.

Table 4.3.13-2. Radon Level Tests and Results by Zip Codes in Chester County

ZIP Code	Location	Area in Home	Number of Tests	Maximum Result (pCi/L)	Average Result (pCi/L)
19301	Paoli	Basement	2962	333.2	7.3
		First Floor	629	61.2	5.3
19310	Atglen	Basement	362	91.9	11.1
		First Floor	52	33.8	5.3
19311	Avondale	Basement	1043	47.4	3.0
		First Floor	96	23.5	2.6
19312	Tredyffrin	Basement	4636	359.6	6.4
		First Floor	1015	111.7	4.2
19320	Valley Township	Basement	9066	1669.0	10.6
		First Floor	1170	213.3	7.1
19330	Cochranville	Basement	721	574.3	11.6
		First Floor	98	31.4	4.6
19333	Devon	Basement	2141	165.1	5.7
		First Floor	589	100.8	3.4
19335	Downingtown	Basement	14785	357.6	6.7
		First Floor	2134	108.1	4.0
19341	Exton	Basement	4258	137.0	3.3
		First Floor	731	74.2	2.1
19343	Glenmore	Basement	2374	116.9	5.4
		First Floor	342	55.0	2.8
19344	Honey Brook	Basement	1344	193.0	6.0
		First Floor	169	34.5	2.9
19347	Kemblesville	Basement	41	34.5	3.5
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19348	Kennett Square	Basement	4604	322.8	3.9
		First Floor	723	92.0	2.3
19350	Landenberg	Basement	2326	50.3	3.3
		First Floor	324	22.1	1.9
19352	Lincoln University	Basement	1214	201.4	4.1
		First Floor	161	21.0	2.0
19353	Exton	Basement	34	81.0	7.8
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19355	Malvern	Basement	7454	250.0	6.8
		First Floor	1524	116.0	4.0
19360	New London	Basement	65	19.4	3.8
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19362	Nottingham	Basement	466	314.1	8.3
		First Floor	55	28.2	3.4
19363	Oxford	Basement	1994	181.6	4.9
		First Floor	212	50.3	2.6
19365	Parkesburg	Basement	1424	1530.0	23.1
		First Floor	180	577.2	15.0
19369	Sadsburyville	Basement	53	258.0	31.9
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19372	Downingtown	Basement	521	155.0	5.5
		First Floor	128	26.3	2.8
19374	Toughkenamon	Basement	33	10.3	3.9
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19375	Unionville	Basement	142	54.9	4.8
		First Floor	36	3.8	1.5
19382	West Chester	Basement	10805	1465.3	3.1
		First Floor	1983	71.3	1.9



ZIP Code	Location	Area in Home	Number of Tests	Maximum Result (pCi/L)	Average Result (pCi/L)
19390	West Grove	Basement	1585	113.0	3.3
		First Floor	231	21.5	1.9
19395	Westtown	Basement	91	32.1	2.7
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19421	Birchrunville	Basement	99	33.8	4.6
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19425	Chester Springs	Basement	5126	287.4	5.3
		First Floor	632	76.7	3.3
19442	Kimberton	Basement	223	53.1	5.3
		First Floor	89	24.2	2.4
19460	Phenixville	Basement	9205	183.0	4.9
		First Floor	1502	42.5	2.4
19465	Pottstown	Basement	2305	224.3	5.5
		First Floor	249	60.9	3.3
19475	Spring City	Basement	1710	187.3	5.7
		First Floor	259	123.7	3.5
19481	Valley Forge	Basement	278	102.0	4.7
		First Floor	104	14.7	2.6
19520	Elverson	Basement	1021	182.9	6.6
		First Floor	133	90.1	3.9

Source: PADEP 2020

4.3.13.4 Future Occurrence

Radon exposure is inevitable given present soil, geologic, and geomorphic factors across Pennsylvania. Residents who live in housing developments within areas where radon levels previously have been found to be significantly high will continue to be more susceptible to exposure. However, new incidents of concentrated exposure may occur with future development or deterioration of older structures. Exposure can be limited by conducting proper testing within both existing and future developments and implementing appropriate mitigation measures (PEMA 2016). As part of a 2014 initiative to raise awareness, EPA implemented the “Test, Fix, Save a Life” radon action campaign to highlight radon testing and mitigation as a simple and affordable step to significantly reduce the risk of lung cancer. Through this initiative, the “Test, Fix, Save a Life” mantra specifies activities and facts for the public regarding radon poisoning, as indicated below:

- Test: All homes with or without basements should be tested for radon. Affordable, do-it-yourself radon test kits are available online and at home improvement and hardware stores, or you can hire a qualified radon tester.
- Fix: EPA recommends taking corrective action to fix radon levels at or above 4 pCi/L and contacting a qualified radon-reduction contractor. In most cases, a system with a vent pipe and fan is used to reduce radon. Addressing high radon levels often costs the same as other minor home repairs.
- Save a Life: More than 20,000 Americans die from radon-related lung cancer each year. By decreasing elevated levels in the home, residents can help prevent lung cancer while creating a healthier home (EPA 2013).

Future occurrences of radon exposure can be considered *likely* as defined by the Risk Factor Methodology probability criteria (discussed in Section 4.4).

4.3.13.5 Vulnerability Assessment

To understand risk, a community must evaluate the assets that are exposed or vulnerable within the identified hazard area. This section evaluates and estimates the potential impact of the radon exposure hazard on Chester County in the following sections:

- Overview of vulnerability



- Data and methodology used for the evaluation
- Impacts on (1) life, health, and safety; (2) general building stock and critical facilities; (3) the economy; and (4) the environment
- Future growth and development
- Further data collections that will assist in understanding this hazard over time
- Additional data and next steps

Overview of Vulnerability

Radon exposure is of concern in Chester County because of the county’s location within a high potential (Level 1) EPA Radon Zone. While structural factors (such as building construction and engineered mitigation measures) can influence the level of radon exposure, all residents and structures within Chester County are vulnerable to radon exposure.

Data and Methodology

The 2018 U.S. Census data and the Hazards U.S.-Multi Hazard (HAZUS-MH) building inventory for Chester County were referenced to support an evaluation of assets exposed to this hazard and potential impacts associated with this hazard. According to the 2018 Pennsylvania State HMP, an average radon mitigation system cost of \$1,200 was applied to 20 percent of the building stock to evaluate economic vulnerability (EPA 2016).

Impact on Life, Health, and Safety

For the purposes of this plan, the entire population of the county is assumed to be at risk of radon exposure. Radon is responsible for more than 20,000 of lung cancer deaths every year. Lung cancer is the only known effect on human health from exposure to radon in air, and thus far, no evidence indicates that children are at greater risk of lung cancer than adults (EPA 2016).

As shown in Figure 4.3.13-3 above, 89 percent of homes in Chester County have measured radon levels exceeding 4 pCi/L. Excess human cancer risk posed by radon exposure at this elevated level is identified in Table 4.3.13-1.

Impact on General Building Stock and Critical Facilities

While the entire general building stock and critical facility inventory in Chester County is exposed to radon, radon does not result in direct damage to structures and facilities. Rather, engineering methods installed to mitigate human exposure to radon in structures results in economic costs described in the following subsection.

Impact on the Economy

EPA has concluded that an average radon mitigation system costs \$1,200. EPA also states that current state surveys indicate that one home in five has elevated radon levels. Based on this information, radon loss estimation is factored by assuming that 20 percent of the residential buildings within high potential (Level 1) counties have elevated radon levels, and each would require a radon mitigation system installed at the EPA estimated average of \$1,200 (EPA, 2016). Therefore, estimated radon mitigation costs for residential structures in Chester County could exceed \$41 million. However, 72 percent of households in the county have measured average radon levels exceeding 4 pCi/L (shown on Figure 4.3.13-3), indicating that the cost of radon mitigation may be higher than the estimate based on the above-cited information from EPA, whereby only 20 percent of structures are considered for mitigation.

Impact on the Environment

Radon exposure exerts minimal environmental impacts. Because of the relatively short half-life of radon, it tends to affect only living and breathing organisms such as humans or pets that are routinely within contained areas (basement or house) near the source from which the gas is released (EPA, 2016).



Future Growth and Development

Because the entirety of Chester County has been determined at risk for the radon exposure hazard, any new construction development will be exposed to this risk. Measures to reduce human exposure to radon in structures are readily available and can be incorporated during new construction at significantly lower cost and greater effectiveness than retrofitting existing structures to implement these measures.

Additional Data and Next Steps

The assessment above identifies human health and economic losses associated with this hazard of concern; however, these estimates are based on national epidemiological statistics and generalized estimates of costs to mitigate structures in Chester County. Because specific structural conditions affect human exposure to radon, direct radon measurements within facilities are necessary to properly assess the level of health risk and indicate the need for mitigation measures. Furthermore, EPA recommends that new construction projects consider radon exposure risk and installation of mitigation measures as appropriate.



4.3.14 Structural Fires

This section provides a profile and vulnerability assessment of the structural fire hazard for the Chester County Hazard Mitigation Plan (HMP) update.

4.3.14.1 Location and Extent

Structural fires within Chester County have had a detrimental impact on life, property, and the local economy over the past decade. The age of many residential structures within the region, combined with changes in building construction and materials, created a threat of fire loss that is occurring on a regular basis.

As defined by the National Fire Protection Agency (NFPA) in the *NFPA 901: Standard Classifications for Incident Reporting and Fire Protection Data*, a structure fire is defined as “Any fire inside, on, under, or touching a structure.” This definition includes any mobile living structure, such as a mobile or modular residence, but does not include road-worthy vehicles such as recreation vehicles (NFPAa 2011).

4.3.14.2 Range of Magnitude

The severity of structural fires varies according to the losses associated with the incident. The impact to the local economy is minimal with the loss of a residential structure; however, effects of the loss of a large manufacturing facility that employs a large number of people can be extensive. Likewise, the impact to the local environment from a single residential fire is minimal, while the impact from an industrial or commercial fire can take years to measure. Finally, the loss of life caused by structural fires appears to be opposite of the previous two impacts. The loss of life during a residential fire is more likely than during an industrial or commercial building fire. The building composition is combined with the hour of the incident to increase the loss of life during a residential-type fire.

The structural fires within Chester County are usually small and generally affect residential structures. These fires are limited in duration and are generally contained within the local jurisdiction. While the average fire is small, the threat from a large or even catastrophic fire is always present. Many operations within larger industrial and commercial sites within Chester County are prone to and have experienced small fires that, if improperly contained, can and do lead to catastrophic fire losses. Combined with the presence of volatile materials, these threats are ever changing and increasing within the region.

Vacant buildings (both residential and commercial) pose a particular threat concerning structural fires. Multiple incidents of structural fires in unoccupied homes have been reported through the Knowledge Center.

4.3.14.3 Past Occurrence

Structural fires most frequently affect residential communities within Chester County.

Structural fire data are available from 2017 to June 2020; during this period, a total of 3,377 structural fires were reported in Chester County. A total of 976 structural fires were reported in the county in 2017; 1,013 fires were reported in 2018; and 986 fires were reported in the county in 2019. From January to June 2020, a total of 402 fires have been reported (Chester County 2020). Details on losses, injuries, and fatalities caused by these events were not found. No federal disasters have been declared as a result of structural fires in Chester County.

4.3.14.4 Future Occurrence

Based on the Risk Factor Methodology Probability Criteria, structural fires are categorized as *highly likely*. An NFPA 2009 report based on historical data collected entitled, *A Few Facts at the Household Level*, stated that



an average household is expected to experience a fire within a structure every 15 years based on an average expectancy of the household to be 78 years (NFPA 2009). While most of these fires will be considered small and may not cause any significant damage, the possibility of a catastrophic loss caused by fire is present. Given the rate of occurrence of fires each year in Chester County, the annual probability of a structural fire occurring in the county is 100 percent.

The NFPA reports that the rate of occurrence of home fire deaths has been cut roughly in half since 1980, and population-based home fire and fire death rates have fallen by roughly two-thirds. The death rate per 1,000 reported fires has remained fairly consistent and was actually slightly higher in recent years than in 1980. It appears that most of the reduction in fire deaths over the past decades is due to a reduction in total fires, rather than the prevention of harm after a fire is reported (NFPA 2018). This was driven by an even more pronounced increase in the rate for one- and two-family homes. Chester County has seen an increase in structural fires from 2017 to 2018, and a decrease from 2018 to 2019. The quantity of residential and industrial structures within Chester County, combined with a varying range of fire code enforcement, equates to a greater probability of loss in the future. In addition, the influx of commercial and industrial sites being developed within Chester County also increases the possibility of future commercial or industrial fires.

4.3.14.5 Vulnerability Assessment

Structural fires most frequently affect the residential communities within Chester County. While the impact of most structural fires is considered minimal because of the availability of support services after a fire, these fires need to be classified as a *high threat* based on the frequency and potential for injury and loss of life.

The increases in population within Chester County lead to a greater probability of structural fires. The sustained growth within the county, both commercial and residential, will continue to affect the threat of structural fires in the future.

To understand risk, a community must evaluate the assets that are exposed or vulnerable in the area identified. The following sections discuss the potential impact of the terrorism hazard on Chester County, including:

- Overview of vulnerability
- Impact on (1) life, health, and safety; (2) general building stock and critical facilities; (3) the economy; and (4) the environment
- Future growth and development
- Effect of climate change on vulnerability

Overview of Vulnerability

Many factors influence vulnerability to a structural fire. Age of structure, building materials, density of the area of the building location, proximity to flammable vegetation, and the presence of accelerants are all factors that influence likelihood and vulnerability to structural fire. Older structures may not have been built with the same level of fire prevention required by modern building codes and therefore may be more susceptible to fire than a modern structure. More densely-populated areas of Chester County face a higher vulnerability because of the proximity of residences to each other and other commercial structures. Industrial and commercial facilities are also susceptible to structural fire, and fires in these facilities may have a greater impact on the county.

Impact on Life, Health, and Safety

The impact of structural fires on life, health, and safety will vary depending on the size and magnitude of fires and availability of firefighting resources. Structural fires that occur in industrial or commercial buildings may have a significant impact on life, health, and safety depending on the contents of the structures. First responders'



safety may be at risk during on-scene operations. They may also have a limited access to roads due to obstructions or damaged infrastructure. First responders may have a higher than normal call volume and demand and additional responsibilities including traffic control and debris removal from roads.

Impact on General Building Stock and Critical Facilities

Structural fires will impact the Chester County general building stock. Impacts will vary based on the size and severity of the fire, and number of structures affected by the fire. Physical damage to structures and contents could occur. Impacts to critical facilities may include damage to equipment, interruption of emergency communications, or disruption of services. If a public safety or medical facility is affected, life, health, and safety of people within the county could be impacted.

Impact on the Economy

Structural fires may cause impacts on the economy depending on the scale and severity of the fire. Economic impacts of structural fires may result in lost wages from temporarily or permanently closed businesses, destruction and damage involving business and personal assets, loss of tax base, recovery costs, and lost investments in destroyed property (PEMA 2018).

Impact on the Environment

Environmental impacts from a structural fire could occur if hazardous materials are released. Debris from fire can also contain chemicals or substances, which may also impact the environment.

Future Growth and Development

Areas targeted for potential future growth and development in the next 5 to 10 years have been identified in Chester County (further discussed in Section 2.4 of this HMP update). Any areas of growth could be impacted by the structural fire hazard because all structures within the county are potentially vulnerable.

Effect of Climate Change on Vulnerability

Climate change could potentially impact the likelihood of structural fire. Areas located in the wild-urban interface could be more susceptible to a structural fire if a naturally-occurring wildfire spreads to structures. Extreme temperatures could potentially influence the instance of a structural fire, either from a higher air temperature or from using space heaters and heating appliances indoors during periods of colder weather.



4.3.15 Terrorism

This section provides a profile and vulnerability assessment of the terrorism hazard for the Chester County Hazard Mitigation Plan (HMP) update.

4.3.15.1 Description

According to the Federal Bureau of Investigation (FBI), terrorism is “the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives” (National Institute of Justice 2019). Acts of terrorism include threats of terrorism, assassinations, kidnappings, hijackings, bomb scares and bombings, cyber-attacks (computer-based attacks), and use of chemical, biological, nuclear, and radiological weapons (Federal Emergency Management Agency [FEMA] 2009). Various types of terrorism are discussed in the sections below.

Agroterrorism

Agroterrorism is the intentional use of plant or animal pathogens to cause devastating disease in the agricultural sector. Acts of agroterrorism share similarities with bioterrorism, but the aim of agroterrorism is to specifically target crops and livestock to cause a significant economic impact or to damage food supplies (FEMA 2007).

Armed Attacks and Assassinations

Armed attacks include raids and ambushes. An assassination is the killing of a selected victim, usually by bombings or small arms. A drive-by shooting is a common technique employed by unsophisticated or loosely organized terrorist groups. Historically, terrorists have assassinated specific individuals for psychological effect.

Arson and Firebombing

Incendiary devices are inexpensive and easy to hide. Arson and fire-bombings are easily conducted by terrorist groups that may not be as well organized, equipped, or trained as a major terrorist organization. An act of arson or firebombing against a utility, hotel, government building, or industrial center portrays an image to the public that the ruling government is incapable of maintaining order.

Bioterrorism

Bioterrorism refers to intentional release of toxic biological agents to harm and terrorize civilians, in the name of a political or other cause. The U.S. Centers for Disease Control and Prevention (CDC) has classified the viruses, bacteria, and toxins that could be used in an attack. Category A Biological Diseases are most likely to cause the greatest harm. They include:

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum toxin*)
- Plague (*Yersinia pestis*)
- Smallpox (*Variola major*)
- Tularemia (*Francisella tularensis*)
- Hemorrhagic fever caused by Ebola virus or Marburg virus

Bombings

Bombings are the most common type of terrorist act. Typically, improvised explosive devices (IED) are inexpensive and easy to make. Bombs can range from smaller packages to vehicle-borne bombs that are capable of catastrophic damage. Modern devices are smaller and harder to detect and have destructive capabilities.



Terrorists responsible for this bombing can use materials readily available to the average consumer to construct a bomb.

Cyber Terrorism

Cyber terrorists use information technology to attack civilians and draw attention to the terrorists' cause. They may use information technology, such as computer systems or telecommunications, as a tool to orchestrate a traditional attack. More often, cyber terrorism refers to an attack on information technology itself in a way that would radically disrupt networked services. For example, cyber terrorists could disable networked emergency systems or hack into networks that house critical financial information. There is wide disagreement about the extent of the existing threat by cyber terrorists.

Hijackings and Skyjackings

Hijacking is seizure by force of a surface vehicle, its passengers, or its cargo. Skyjacking is the overtaking of an aircraft, which creates a mobile, hostage barricade situation. A skyjacked aircraft has the potential to provide terrorists with hostages from many nations and draws heavy media attention. Skyjacking also provides mobility for the terrorists to relocate the aircraft to a country that supports their cause and provides them with a human shield, making retaliation difficult.

Intentional Hazardous Materials Release

Intentional hazardous materials release is intentional leak, spillage, discharge, or disposal of hazardous materials or substances (such as explosives, toxic chemicals, and radioactive materials) (U.S. Department of Homeland Security [DHS] 2018). This could include the intentional release of chemicals commonly used in industry, or the release of chemical agents as a weapon. This might involve attacking hazardous material storage facilities or attacking storage containers in transit. Intentional hazardous materials releases can have a significant impact on human health and the environment.

Kidnappings and Hostage-Takings

Terrorists use kidnapping and hostage-taking to establish a bargaining position and to elicit publicity. Kidnapping is one of the most difficult acts for a terrorist group to accomplish, but a successful kidnapping can gain terrorists money, release of jailed comrades, and publicity for an extended period. Hostage-taking involves seizure of a facility or location and taking hostages present in that facility. Unlike a kidnapping, hostage-taking provokes a confrontation with authorities. It forces authorities to make dramatic decisions or to comply with the terrorist's demands. It is overt and designed to attract and hold media attention. The intended target is the audience affected by the hostage's confinement, not the hostage.

Nuclear/Radiological Terrorism

Nuclear and radiological terrorism refers to a number of different ways nuclear materials might be exploited as a terrorist tactic. These methods include attacking nuclear facilities, purchasing nuclear weapons, or building nuclear weapons or otherwise finding ways to disperse radioactive materials.

4.3.15.2 Location and Extent

Terrorism can occur anywhere within Chester County depending on an individual's or organization's agenda. Any facility or structure is vulnerable to a terrorist attack, as terrorists have historically sent chemical or biological agents through the mail. High-risk targets include local, county, state, or federal government facilities; major venues and gathering places; sites with historical, cultural, or other significance; and critical infrastructure. Damage to or disruption of operations at government facilities could profoundly impact Chester County's population, even if the terrorism event is relatively small scale.



An important consideration in evaluating terrorism hazards is the existence of facilities, landmarks, or other buildings of international, national, or regional importance. While Chester County has many notable landmarks from a local historical perspective, no sites within the county are considered significant landmarks in terms of national or international importance. Nonetheless, terrorism can take many forms, and terrorists have a wide range of personal, political, or cultural agendas. Therefore, no location within Chester County is immune from being a potential terrorist target.

A few types of terrorist activities are particularly relevant to Chester County: cyber terrorism, conventional/improvised bomb threat, and armed attacks. A cyber-attack can take the form of data breaches, crippling computer viruses, or even damage to physical technology infrastructure (Chester County 2015). A bomb threat can be verbal or written to ignite an explosive device to cause property damage, death or injuries to victims, and/or to incite fear. An armed attack is using a weapon to cause property damage, death, injuries, and/or incite fear.

Although Chester County does not have a large number of facilities that could be considered nationally important targets, it does have critical infrastructure that, if attacked, could have significant effects at the local or regional level. Critical infrastructure can include financial center, government buildings, media outlets, transportation authorities, power/utilities companies, and telecommunications networks (Chester County 2015). Several major transportation routes and gas transmission pipelines traverse Chester County, making intentional hazard material releases a potential threat to citizens and the environment. This hazard is addressed in this HMP in Section 4.3.12, Pipeline Incidents. In addition, several bridges and railways (discussed in Section 4.3.17, Transportation Accidents) connect Chester County to the Philadelphia metropolitan area that could be considered potential targets. A complete list of critical facilities is included in Appendix I.

Acts of terrorism can occur anywhere, at any time of day. The National Terrorism Advisory System (NTAS) communicates information about terrorist threats by providing detailed information to the public, government agencies, first responders, airports and other transportation hubs, and the private sector. Information can be distributed through two mediums: Bulletins or Alerts. NTAS Bulletins are used to disseminate critical information regarding terrorism that may not relate to a specific threat (DHS 2018).

When a threat arises, the Secretary of Homeland Security announces an NTAS Alert and shares the news with the public. The alert may include specific information about the nature of the threat, including the geographic region, mode of transportation, or critical infrastructure potentially affected as well as steps that individuals and communities can take to protect themselves and help prevent, mitigate, or respond to the threat. The alert indicates whether the threat is elevated or imminent. Elevated threats are those that include no specific information about the timing or location. Imminent threats are threats believed to be impending or occurring very soon. DHS will issue an NTAS advisory through their website, news media, and its social media channels such as Facebook and Twitter (DHS 2018).

4.3.15.3 Range of Magnitude

The magnitude of a terrorism event depends on the scale of the attack, population involved, equipment and other key assets affected, and duration of the incident or exposure to the agent used. The effect of a terrorism event can vary depending on the type of attack and the magnitude of the event or events. Terrorism events can cause public fear regarding the use of mass transportation or leaving their homes in the event of a biological or nuclear attack. Communication systems, both public and private, can fail because of an overwhelming amount of usage or damage to its infrastructure. Healthcare facilities can become quickly inundated and must be prepared to triage injured patients, handle mass casualties, and conduct decontamination operations. The secondary hazards resulting from a terrorist attack depend on the size and scope of the incident. Some possible secondary hazards



include widespread utility failure, health effects such as epidemics or pandemics, flooding (if a dam was destroyed), and environmental contamination.

The worst-case scenario for a terrorism event in Chester County would be an active threat incident or a mass casualty event. The active threat incident would be a shooting or stabbing resulting in mass casualties—similar to the West Nickel Mines School in Bark Township, Pennsylvania, which occurred on October 2, 2006. Another type of worst-case scenario would be a mass casualty event in the form of a vehicular attack or an improvised explosive device that could result in a combination of mass casualties and fatalities. Generally speaking, any event that results in mass casualties or fatalities could overwhelm the capabilities of Chester County, emergency services, and healthcare facilities and hospitals.

Furthermore, the threat of a nuclear attack is rare but should not be eliminated. Numerous countries in the world have nuclear warfare capability, and other nations continue to try to obtain that capability. Areas such as cities or buildings that are identified as high-risk areas or target areas would experience the direct effects of the weapon, including blast, radiation, extreme temperatures, wind, and light that is brighter than the sun. Depending on its size, a device could cause total destruction within a 4-mile radius of the blast. Any survivors within a 20-mile radius can expect residual effects including fires, flooding, loss of power, and fuel and water shortages, with addition risk of a release of other hazardous materials that may be in the area. People close to the blast would be killed. As the distance increases, more people will survive; however, people who do survive the initial blast may die due to an increase in exposure to gamma rays.

Because of its location within the Philadelphia metropolitan area, Chester County should expect to receive some exposure from radioactive fallout should a major attack occur. Chester County should also expect to see a surge of people from the Philadelphia metropolitan area seeking safety.

4.3.15.4 Past Occurrence

Chester County has never suffered an international terrorist attack. However, Chester County has experienced domestic terrorism incidents. Nuisance cyber-attacks, viruses, and attempts at phishing are part of daily operations for many information technology departments. Recently, Chester County residents experienced a few instances of Denial of Service attacks, which is a type of cyber-attack in which the perpetrator attempts to overwhelm an online service and render it unstable. These attacks occurred throughout the southeastern Pennsylvania region. No major successful attacks against large systems or computer networks have occurred that caused an impact to the community (Chester County 2015).

From 2010 to 2013, the county has had a total of 35 criminal homicides, 731 robberies, and 4,403 assaults (Chester County 2015). Chester County is rural in nature and for most of its history, residents have not experienced any major civil disorders. Most of the incidents that have happened are localized in an urban area and short lived. Table 4.3.15-1 lists civil disorders that have happened in the county between 2014-2019.

Table 4.3.15-1. Terrorism Incidents/Suspicious Activity in Chester County from 2014-2019

Date of Event	Event Type	Location	Description of Incident
March 14, 2014	Terrorist Activity	North Coventry Township	Explosive discovered
April 4, 2014	Terrorist Activity	West Chester Borough	Bomb threat
April 15, 2014	Terrorist Activity	Westtown Township	Bomb threat
April 15, 2014	Terrorist Activity	Chester County	Bomb threat at a school



Date of Event	Event Type	Location	Description of Incident
May 30, 2014	Terrorist Activity	New Garden Township	Suspicious Conditions
June 28, 2014	Terrorist Activity	Various municipalities	A series of bomb threats at CVSs in East Goshen Township, East Bradford Township, Thornury Township, Birmingham Township, Upper Uwchlan Township, and Uwchlan Township.
June 28, 2014	Terrorist Activity	Caln Township	Bomb threat at Hospital
September 11, 2014	Terrorist Activity	Chester County	KMS bomb threat
September 18, 2014	Terrorist Activity	Phoenixville Borough	Bomb threat to residence
September 19, 2014	Terrorist Activity	Uwchlan Township	Suspicious conditions
October 10, 2014	Terrorist Activity	Tredyffrin Township	Suspicious activity at PECO facility
October 17, 2014	Terrorist Activity	Kennett Township	Bomb threat
October 22, 2014	Terrorist Activity	Chester County	Bomb threat
October 23, 2014	Terrorist Activity	Upper Uwchlan Township	Bomb/explosives found
October 29, 2014	Terrorist Activity	New Garden Township	Found ammunition
November 10, 2014	Terrorist Activity	Chester County	Avon Grove High School bomb threat
November 29, 2014	Terrorist Activity	West Brandywine Township	Bomb threat
January 23, 2015	Civil Disorder	West Goshen Township	Officer injury
February 14, 2015	Terrorist Activity	Chester County	Explosive found in a residence
March 17, 2015	Terrorist Activity	Westtown Township	Bomb threat
March 23, 2015	Terrorist Activity	Parkesburg Borough	Barricaded subject
July 4, 2015	Terrorist Activity	Chester County	Poisoning
September 24, 2015	Terrorist Activity	Chester County	Bomb threat
September 25, 2015	Terrorist Activity	Willistown Township	Bomb threat
October 5, 2015	Terrorist Activity	Tredyffrin Township	Suspicious conditions and suspicious package
October 19, 2015	Terrorist Activity	West Whiteland Township	Bomb threat
November 2, 2015	Terrorist Activity	Oxford Borough	Bomb threat
November 4, 2015	Terrorist Activity	New Garden Township	Bomb threat
December 18, 2015	Terrorist Activity	Oxford Borough	School bomb threat
December 21, 2015	Terrorist Activity	East Marlborough Township	School bomb threat
December 21, 2015	Terrorist Activity	Caln Township	Hospital bomb threat
December 22, 2015	Terrorist Activity	Phoenixville Borough	School bomb threat



Date of Event	Event Type	Location	Description of Incident
January 11, 2016	Terrorist Activity	Oxford Borough	School bomb threat
January 21, 2016	Terrorist Activity	East Marlborough Township	School bomb threat
January 21, 2016	Terrorist Activity	Penn Township	Suspicious package at school
March 31, 2016	Terrorist Activity	Uwchlan Township	Suspicious package found
May 4, 2016	Terrorist Activity	Oxford Borough	School bomb threat
May 12, 2016	Terrorist Activity	Phoenixville Borough	School incident
May 23, 2016	Terrorist Activity	West Goshen Township	Bomb threat
October 18, 2016	Terrorist Activity	Oxford Borough	Terrorist activity
November 24, 2016	Terrorist Activity	West Whiteland Township	Terrorist activity
December 16, 2016	Terrorist Activity	East Marlborough Township	Terrorist activity
March 14, 2017	Terrorist Activity	Coatesville City	Bomb threat
March 26, 2017	Civil Disorder	Pocopson Township	Prison disturbance
March 28, 2017	Terrorist Activity	West Goshen Township	Bomb threat
April 13, 2017	Terrorist Activity	Upper Uwchlan Township	Possible bottle bomb found
April 30, 2017	Terrorist Activity	West Whiteland Township	Bomb threat
May 13, 2017	Terrorist Activity	Parkesburg Borough	Barricaded subject
May 30, 2017	Terrorist Activity	East Whiteland Township	Threat received
July 10, 2017	Terrorist Activity	West Sadsbury Township	Parkesburg Walmart bomb threat
July 26, 2017	Terrorist Activity	Uwchlan Township	Hostage situation
August 2, 2017	Civil Disorder	Downingtown Borough	Frogs invade Downingtown
August 31, 2017	Terrorist Activity	Uwchlan Township	Bomb found
November 1, 2017	Terrorist Activity	West Goshen Township	Bomb threat
December 7, 2017	Terrorist Activity	West Chester Borough	Bomb threat
December 19, 2017	Terrorist Activity	West Goshen Township	Suspicious package
February 28, 2018	Terrorist Activity	Caln Township	School lock-down
April 15, 2018	Terrorist Activity	West Whiteland Township	Walmart bomb threat
June 9, 2018	Terrorist Activity	Caln Township	Bomb threat
August 12, 2018	Terrorist Activity	Parkesburg Borough	ERT Team Activation
August 16, 2018	Terrorist Activity	Sadsbury Township	Bomb threat



Date of Event	Event Type	Location	Description of Incident
September 6, 2018	Terrorist Activity	Willistown Township	Possible explosive found
October 9, 2018	Terrorist Activity	West Caln Township	Explosives discovered
October 13, 2018	Civil Disorder	Lower Oxford Township	Large fight
November 9, 2018	Civil Disorder	Lower Oxford Township	Large fight at Lincoln University
November 27, 2018	Terrorist Activity	Penn Township	Bomb threat
December 13, 2018	Terrorist Activity	Various municipalities	Bomb threats in Willistown Township, West Goshen Township, Uwchlan Township, Tredyffrin Township, Kennett Township, Honey Brook Borough, and Birmingham Township
February 15, 2019	Terrorist Activity	Chester County	Chester County Cyber Security Event

Source: Chester County DES

4.3.15.5 Future Occurrence

Based on historical events, Chester County can expect to experience several terrorist threats or suspicious activities each year; however, few will result in an actual terrorist incident. Previous events in Chester County have not resulted in significant terrorist attacks; however, the severity of a future incident cannot be predicted with a sufficient level of certainty. Based on the recent incident events, the future occurrence of terrorism in Chester County can be considered *highly likely* as defined by the Risk Factor Methodology probability criteria (discussed in Section 4.4).

4.3.15.6 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the area identified. The following sections discuss the potential impact of the terrorism hazard on Chester County, including:

- Impact on (1) life, health, and safety; (2) general building stock and critical facilities; and (3) the economy
- Future growth and development
- Effect of climate change on vulnerability
- Additional data and next steps

Impact on Life, Health, and Safety; General Building Stock and Critical Facilities, and the Economy

The probability of Chester County becoming a terrorist target should remain relatively low; however, because of its proximity to other more vulnerable areas, its vulnerability and potential for secondary impacts is increased. Chester County may experience some serious issues caused by an influx of people from the larger metropolitan areas to the east in situations of terrorism and/or nuclear threats to these areas. This influx of population in these critical situations would stress the facilities of Chester County, its municipalities, and first responders. First responders' safety may be at risk during on-scene operations, and there would be a higher than normal call volume/demand. First Responders may have to perform additional duties such as traffic control and responding to traffic incidents.

Because the probability of terrorism occurring cannot be quantified in the same way as that of many natural hazards, it is not possible to assess vulnerability in terms of likelihood of occurrence. Instead, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist targets in a community, planning efforts can be put in place to reduce the risk of attack. All communities in Chester County are vulnerable on



some level, directly or indirectly, to a terrorist attack. However, communities where the previously mentioned potential targets are located should be considered more vulnerable. Site-specific assessments should be based on the relative importance of a particular site to the surrounding community or population. Assessment questions to consider when assessing inherent and tactical vulnerabilities to specific Chester County assets are listed below:

- Inherent vulnerability:
 - Visibility – How aware is the public of the existence of the facility?
 - Utility – How valuable might the place be in meeting the objectives of a potential terrorist?
 - Accessibility – How accessible is the place to the public?
 - Asset mobility – Is the asset’s location fixed or mobile?
 - Presence of hazardous materials – Are flammable, explosive, biological, chemical, and/or radiological materials present on-site? If so, are they well secured?
 - Potential for collateral damage – What are the potential consequences for the surrounding area if the asset is attacked or damaged?
 - Occupancy – What is the potential for mass casualties based on the maximum number of individuals on-site at a given time?

- Tactical vulnerability:
 - Site Perimeter*
 - Site planning and Landscape Design – Is the facility designed with security in mind—both site-specific and with regard to adjacent land uses?
 - Parking Security – Are vehicle access and parking managed in a way that separates vehicles and structures?
 - Building Envelope*
 - Structural Engineering – Is the building’s envelope designed to be blast-resistant? Does it provide collective protection against chemical, biological, and radiological contaminants?
 - Facility Interior*
 - Architectural and Interior Space Planning – Does security screening cover all public and private areas?
 - Mechanical Engineering – Are utilities and heating, ventilation, and air conditioning (HVAC) systems protected and/or backed up with redundant systems?
 - Electrical Engineering – Are emergency power and telecommunications available? Are alarm systems operational? Is lighting sufficient?
 - Fire Protection Engineering – Are the building’s water supply and fire suppression systems adequate, code-compliant, and protected? Are on-site personnel trained appropriately? Are local first responders aware of the nature of the operations at the facility?
 - Electronic and Organized Security – Are systems and personnel in place to monitor and protect the facility?

To reduce their vulnerability to terrorism hazards, Chester County belongs to the Southeastern Pennsylvania (SEPA) Regional Task Force (RTF), a group of five counties that collaborate to prevent, protect against, prepare for, respond to, recover from, and mitigate against terrorism and other hazards on a regional level. Like the other regional task forces in Pennsylvania, SEPA-RTF is funded by the Pennsylvania Emergency Management Agency (PEMA) using DHS’s Homeland Security Grant Program’s State Homeland Security Program (SHSP). The counties of SEPA-RTF, including Chester County, use this funding to conduct emergency planning, training, and exercise activities, and to purchase equipment to reduce the region’s vulnerability to terrorism.



Impact on the Environment

The impacts of terrorism can vary in severity from nominal to catastrophic and are contingent upon the method of the attack, the volume of force applied, and the population density of the attack site. A terrorist event may cause significant loss of life for humans and animals as well as economic losses. Additionally, the impact of the attack itself may be exacerbated by the fact that human services agencies like community support programs, health and medical services, public assistance programs, and social services organizations can experience physical damage to facilities, supplies, and equipment as well as disruption of emergency communications. Ancillary effects of terrorism may also occur, such as urban fires or, in the case of a radiological device, radioactive fallout that can multiply the impact of a terrorist event (PEMA 2018).

Future Growth and Development

Areas targeted for potential future growth and development in the next 5 to 10 years have been identified across Chester County (further discussed in Section 2.4 of this HMP). Any areas of growth could be potentially impacted by the terrorism hazard because Chester County is exposed and potentially vulnerable.

Effects of Climate Change on Vulnerability

Because terrorism is a human-caused hazard, climate change is not anticipated to affected vulnerability associated with terrorism.

Additional Data and Next Steps

Any additional information regarding localized concerns and past impacts will be collected and analyzed for the HMP update. These data will be developed to support future revisions to the plan.



4.3.16 Tornado, Windstorm

This section provides a profile and vulnerability assessment of the tornado and windstorm hazard. The wind hazard includes various types of wind events, including windstorms and tornadoes, which are defined below.

A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 250 miles per hour (mph). Damage paths can be greater than 1 mile wide and 50 miles long. Tornadoes typically develop from either a severe thunderstorm or hurricane as cool air rapidly overrides a layer of warm air. Tornadoes typically move at speeds between 30 and 125 mph and can generate combined wind speeds (forward motion and speed of the whirling winds) exceeding 300 mph. The lifespan of a tornado rarely is longer than 30 minutes (FEMA 1997). Tornadoes can occur at any time of the day, with most occurring between 3:00 pm and 9:00 pm. In Pennsylvania, peak occurrence of tornadoes are May through July (NWS 2019).

Windstorms are generally defined with sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. Wind events can vary in spatial size from small, microscale events that take place over only a few hundred meters to large-scale synoptic wind events often associated with warm or cold fronts (PEMA 2018). There are eight different types of damaging winds: straight-line wind, downdraft, downburst, microburst, gust front, derecho, bow echo, and hook echo. Definitions of each type can be found on the National Severe Storms Laboratory (NSSL) website at the following address: <https://www.nssl.noaa.gov/education/svrwx101/wind/types/>

4.3.16.1 Location and Extent

Tornadoes

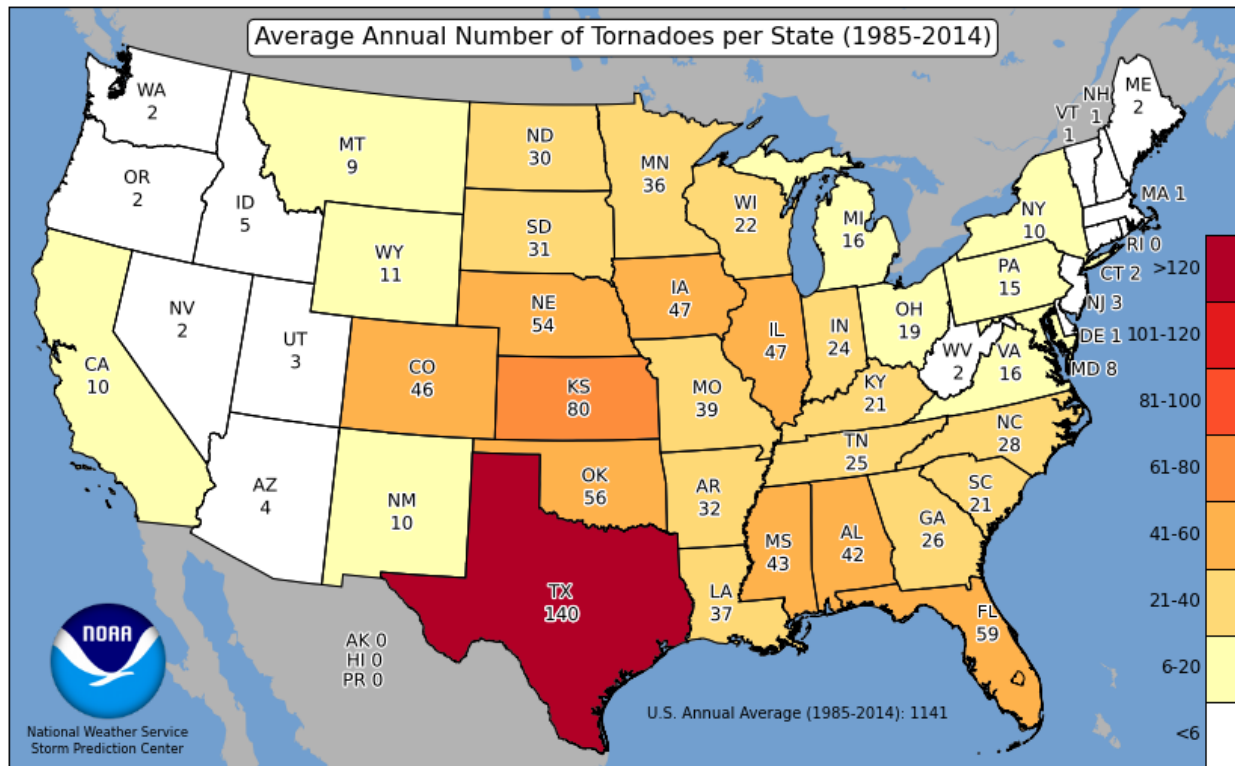
Tornadoes can occur throughout Chester County, though events are usually localized. However, severe thunderstorms that cover a larger geographic area may result in conditions favorable to the formation of numerous or long-lived tornadoes. Tornadoes can occur at any time during the day or night but are most frequent during late afternoon into early evening, which are the warmest hours of the day. These events are most likely to occur during the spring and early summer months of March through June when these conditions are prevalent (PEMA 2018).

Tornado movement is characterized in two ways: direction and speed of spinning winds and forward movement of the tornado, also known as the storm track. Most tornadoes have wind speeds of 110 mph or less, are approximately 250 feet across, and travel a few miles before dissipating. Some attain wind speeds of more than 300 mph, stretch more than a mile across, and stay on the ground for dozens of miles. Some tornadoes are short-lived, while others touch the ground several times (PEMA 2018).

While the extent of tornado damage is usually localized, extreme winds of this vortex can be among the most destructive on Earth when they move through populated, developed areas. Figure 4.3.16-1 shows the annual average number of tornadoes between 1985 and 2014 (Storm Prediction Center [SPC] 2019). The Commonwealth of Pennsylvania experienced an average of 15 tornado events annually.



Figure 4.3.16-1. Annual Average Number of Tornadoes in the United States, 1985 to 2014



Source: SPC 2019

The NSSL used historical data to estimate the daily probability of tornado occurrences across the United States, without considering the magnitude of the tornado; refer to Figure 4.3.16-1. In Pennsylvania, it is estimated that the probability of a tornado occurring is 0.2 to 0.8 day per year. In Chester County, it is estimated that the probability of a tornado occurring is 0.6 to 0.8 day per year (NSSL 2003).

Windstorms



All of Chester County experiences straight-line winds and windstorms. Wind events can vary in spatial size from small microscale events that take place over only a few hundred meters to large-scale synoptic wind events often associated with warm or cold fronts (PEMA 2018). Effects from high winds can include downed trees and power lines and damaged roofs and windows.

4.3.16.2 Range of Magnitude

The magnitude of tornadoes and windstorms is largely dependent upon the most damaging aspects of each type. The magnitude of a tornado is categorized using the Enhanced Fujita Tornado Intensity Scale (EF Scale). This is the scale now used exclusively for determining tornado ratings by comparing wind speed and actual damage. Figure 4.3.16-2 illustrates the relationship between EF ratings, wind speed, and expected tornado damage.



Figure 4.3.16-2. Enhanced Fujita Tornado Intensity Scale Ratings, Wind Speeds, and Expected Damage

EF Rating	Wind Speeds	Expected Damage	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.	
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.	
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.	
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.	

Source: NWS 2018

Tornado watches and warnings are issued by the local NWS office. A tornado watch is announced when tornadoes are possible in an area. A tornado warning means a tornado has been sighted or indicated by weather radar. The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible (NOAA 2011).

The following table provides the descriptions of winds and their associated sustained wind speed used by the NWS during wind-producing events.

Table 4.3.16-1. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2019



The NWS issues advisories and warnings for winds and these are normally site specific. High wind advisories, watches, and warnings are issued by the NWS when wind speeds can pose a hazard or are life-threatening. The criterion for each of these varies from state to state. According to the NWS (2018), wind warnings and advisories for Pennsylvania are as follows:

- *High Wind Warnings* are issued when sustained wind speeds of 40 mph or greater last 1 hour or longer, or for winds of 58 mph or greater for any duration, or when widespread damage is possible.
- *High Wind Watches* are issued when there is the possibility that high wind warning criteria may be met at longer ranges (24 to 48 hours out).
- *Wind Advisories* are issued when sustained winds of 31 to 39 mph are forecast for 1 hour or longer, or wind gusts of 46 to 57 mph occur for any duration.

The most severe tornado to hit Chester County was an EF2 on September 5, 1979. The storm blew over trees, damaged several structures resulting in \$2.5M in property damage, and caused one death and four injuries (NCEI 2019).

4.3.16.3 Past Occurrence

Tornadoes have occurred throughout Pennsylvania. Western and southeastern sections of the Commonwealth have been struck more frequently. Table 4.3.16-2 documents the total number of tornadoes and windstorms that have occurred in Chester County between 1953 and June 1, 2020, based on the NOAA-NCEI database and the Storm Prediction Center severe weather database.

Table 4.3.16-2. Tornado and Windstorm Events, 1953 to 2020

Hazard Type	Number of Occurrences Between 1953 and 2020	Total Fatalities	Total Injuries	Total Property Damage	Total Crop Damage
Funnel Cloud	3	0	0	\$0	\$0
High Wind	7	0	0	\$10,000	\$0
Strong Wind	11	0	0	\$45,000	\$0
Thunderstorm Wind	242	3	9	\$6.354 million	\$0
Tornado	24	2	32	\$13.258 million	\$25,000
Total	287	5	41	\$19.667 million	\$25,000

Source: NOAA-NCEI 2019; SPC 2019

Between 1954 and 2020, Pennsylvania was included in six FEMA declared tornado- and windstorm-related major disaster declarations (DR) or emergencies (EM) classified as one or a combination of the following hazards: high winds, flash floods, severe storms, tornadoes, and flooding. Generally, disasters cover a wide region of the Commonwealth; therefore, many counties could have experienced various types of impacts. Of those declarations, Chester County was included in one declaration (FEMA 2020).

Table 4.3.16-3. Tornado- and Windstorm-Related FEMA Declarations for Chester County, 1954 to 2020

FEMA Declaration Number	Date(s) of Event	Incident Type	Event Title
EM-3081	June 13, 1980	Tornado	Severe Storms & Tornadoes

Source: FEMA 2020

The NOAA-NCEI Storm Events database records tornado and windstorm events. According to the database, 24 tornadoes were recorded in Chester County between 1953 and 2020. These tornadoes include five F/EF0, 12 with an intensity of F/EF1, five with an intensity of F/EF2, and two with an intensity of F/EF3. Chester County’s worst tornado event occurred September 5, 1979, when an EF2 tornado moved across the county. The storm



Section 4.3.16 – Risk Assessment – Tornado, Windstorm

blew over trees, damaged several structures resulting in \$2.5M in property damage, and caused one death and four injuries. Figure 4.3.16-3 illustrates the location of these tornado occurrences in Chester County.

For this HMP update, known tornado and major windstorm events (those with property damage) that have impacted Chester County between 1950 and June 2020 are identified in Table 4.3.16-4. With documentation for Pennsylvania and Chester County being extensive, not all sources have been identified or researched. Therefore, Table 4.3.16-4 might not include all events that have occurred in the county.



Figure 4.3.16-3. Chester County Tornado History

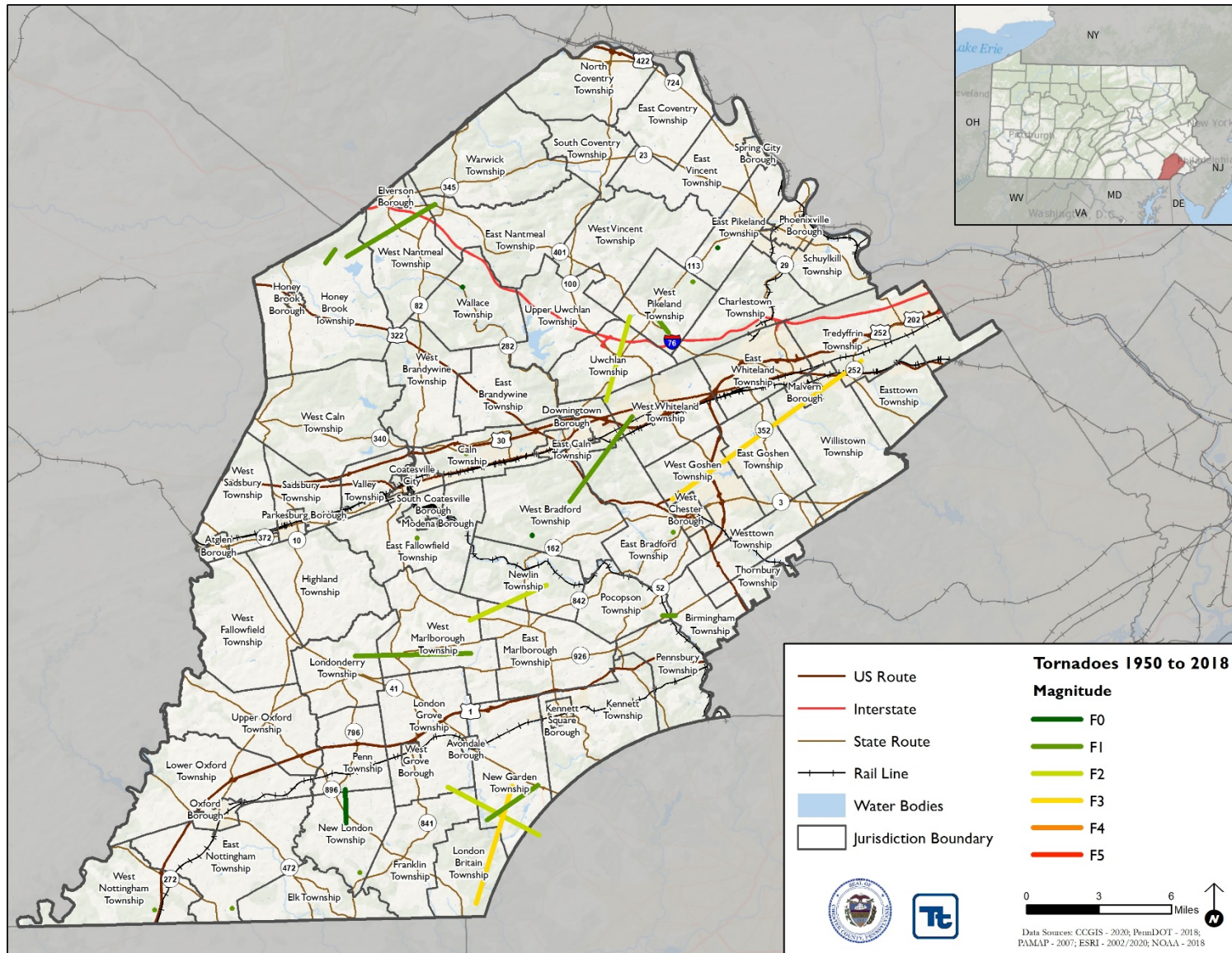




Table 4.3.16-4. Tornado and Windstorm Events in Chester County, 1953 to June 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
June 22, 1953	Tornado (F1)	N/A	N/A	\$2.50K in property damage.
March 22, 1955	Tornado (F3)	N/A	N/A	\$250K in property damage. 1 death reported.
August 19, 1955	Tornado (F2)	N/A	N/A	\$25K in property damage.
November 14, 1969	Tornado (F1)	N/A	N/A	\$25K in property damage.
November 28, 1973	Tornado (F0)	N/A	N/A	\$25K in property damage.
August 4, 1974	Tornado (F1)	N/A	N/A	\$25K in property damage.
April 3, 1975	Tornado (F2)	N/A	N/A	\$2.5K in property damage.
September 5, 1979	Tornado (F2)	N/A	N/A	1 death and 4 injuries. \$2.5M in property damage.
June 13, 1980	Tornado	EM-3081	N/A	Severe storms and tornadoes
July 16, 1980	Tornado (F1)	N/A	N/A	\$2.5K in property damage.
July 17, 1988	Tornado (F1)	N/A	N/A	Trees fell on a garage and two automobiles. Wind damaged a house and a barn. 1 injury was reported. \$250K in property damage.
November 16, 1989	Tornado (F0)	N/A	N/A	A tornado touched down bringing trees down and damaging buildings.
July 9, 1990	Tornado (F1)	N/A	N/A	A tornado uprooted or broke off many trees and downed many utility lines as it moved eastward. \$250K in property damage.
July 17, 1992	Tornado (F2)	N/A	N/A	The tornado had a continuous path for 4 miles many trees were blown down or snapped off. The side of an old barn that had been converted to a restaurant was blown out. \$250K in property damage.
August 28, 1992	Tornado (F2)	N/A	N/A	\$1 mobile home was completely blown apart. 3 people in the mobile home were injured and 2 automobiles were moved around. A shed was picked up and thrown into the side of a truck. Several other homes were damaged by falling trees or by windows being blown out. 250K in property damage.
July 27, 1994	Tornado (F3)	N/A	N/A	11 injuries were reported. 9 houses/buildings were totally destroyed and 49 other sustaining slight or moderate damage. \$5M in property damage.
August 13, 1994	Tornado (F0)	N/A	N/A	Numerous trees were uprooted or snapped. No injuries were reported. \$0 in property damage.
May 29, 1995	Thunderstorm Wind	N/A	N/A	\$75K in property damage within Phoenixville Township
September 8, 1996	Tornado (0)	N/A	N/A	The tornado touched down on Upland Farms and caused damaged to about 30 acres. 40-60 trees were snapped. No structural damage or injuries occurred. \$0 in property damage.



Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
November 2, 1997	Tornado (F0)	N/A	N/A	The tornado uprooted several trees and split tree trunks. It also turned a mint condition antique car on its side and the shed was lifted and tossed. \$25K in property damage.
April 1, 1998	Tornado (F1)	N/A	N/A	1 injury from this tornado were reported. Damage to the Coventry Mall, 8 homes, and a Pizza Hut were damaged. The tornado snapped 2 steel power line towers and cracked 7 utility poles and damaged about 40 trees. \$25K in property damage.
May 31, 1998	Thunderstorm Wind (62kts)	N/A	N/A	2 injuries were reported. A mobile home was destroyed, 5 homes had major damage, 19 homes had minor to moderate damage, and 24 homes had minor or less damage. About 115,000 homes and businesses lost power. \$500K in damage.
June 30, 1998	Thunderstorm Wind (56 kts)	N/A	N/A	A thunderstorm knocked down trees and poles and 185,000 businesses and homes lost power.
November 26, 1999	Tornado (F1)	N/A	N/A	12 injuries were reported and two barns and for houses were destroyed, 25 other homes were damaged. \$3M in property damage.
June 25, 2004	Thunderstorm Wind (35 kts)	N/A	N/A	An old oak tree in Phoenixville knocked down 2 poles and damaged a vehicle as it fell. \$5K in property damage.
August 29, 2006	Tornado (F1)	N/A	N/A	A trailer was pushed off its foundation, a roof was torn off a service building at Guizzetti Mushroom Farm and damaged the roof of three mushroom houses damaging the mushrooms as well. Roads were closed due to downed trees. About 6 homes suffered minor damage. About 150 homes and businesses lost power. \$75K in property damage and \$25K in crop damage.
June 10, 2008	Thunderstorm Wind (56 kts)	N/A	N/A	A severe thunderstorm tore down numerous trees and power lines across Chester County and caused one injury. About 55,000 homes and businesses lost power in the county and 18,000 still were without power the next day. A state of emergency was declared in West Vincent Township because of the numerous blocked roads. \$100K in property damage and 1 injury.
June 20, 2009	Thunderstorm Wind (35 kts)	N/A	N/A	A downed tree pulled down wires onto a pick-up truck on Bradford Avenue in West Chester. The driver and 2 passengers were stuck inside until the power was shut down. \$1,000 in property damage.
August 21, 2009	Thunderstorm Wind (52 kts)	N/A	N/A	Tree limbs and wires were torn down. \$10K in property damage.
June 24, 2010	Thunderstorm Wind (61 kts)	N/A	N/A	Trees and wires were downed. PECO Energy reported about 215,000 customers lost power. \$250K in property damage.
July 25, 2010	Thunderstorm Wind (52 kts)	N/A	N/A	Trees were knocked down and one damaged a home. Of the 45,000 homes and businesses that lost power in the PECO energy service area, Chester County was hardest hit. \$100K in property damage.
September 27, 2010	Tornado (EF0)	N/A	N/A	An EF-0 tornado moved through New London Township. Numerous trees were snapped and a few homes suffered siding and roof damage. A car was also tossed by the tornado. No injuries were reported. \$25K in property damage.
April 5, 2011	Thunderstorm Wind (56 kts)	N/A	N/A	A severe thunderstorm tore shutters from a home in West Chester. \$1,000 in property damage.
April 21, 2012	Thunderstorm Wind (52 kts)	N/A	N/A	\$30K in property damage. Three building roofs in Willistown Township were damaged.



Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
December 22, 2012	Strong Wind	N/A	N/A	Peak wind gusts averaged around 45 mph and knocked down weak trees, tree limbs and wires. \$500 in damage.
December 26, 2012	Strong Wind	N/A	N/A	The wind and rain caused Philadelphia International Airport to have delays of up to 4 hours. There were also 200 cancellations. The winds also brought down weak trees, tree limbs and wires and caused scattered outages. \$3,000 in property damage.
January 31, 2013	High Wind	N/A	N/A	High winds downed weak trees, tree limbs and power lines and caused scattered outages. \$10,000 in property damage.
June 24, 2013	Thunderstorm Wind (56 kts)	N/A	N/A	Several trees were knocked down in Downingtown. Nearly 6,000 homes and businesses lost power in Chester County as the thunderstorms rolled through and Downingtown had nearly a third of them. Second was Caln Township. \$10K in property damage.
November 1, 2013	Thunderstorm Wind (52 kts)	N/A	N/A	A severe thunderstorm knocked down a couple of trees in East Whiteland Township. One fell on and damaged the roof of a home. PECO Energy reported about 1,700 of its customers lost power in Chester County. \$10K in damage.
November 24, 2013	Strong Wind	N/A	N/A	Strong winds knocked down weak trees limbs and power lines and also hampered firefighter efforts extinguishing wildfires. \$100 in property damage.
January 6, 2014	Strong Wind	N/A	N/A	Strong winds knocked over weak tree limbs and wires. \$100 in property damage.
March 12, 2014	Strong Wind	N/A	N/A	The prolonged period of strong winds caused weak tree limbs, trees and power lines to be knocked down and caused widely scattered power outages. Downed trees and/or power lines blocked roadways. \$2,000 in property damage.
July 3, 2014	Thunderstorm Wind (52 kts)	N/A	N/A	A severe thunderstorm knocked down a couple trees in North Coventry Township. One damaged a home. Chester County reported 59,000 outages. \$25K in damage.
July 8, 2014	Thunderstorm Wind (61 kts)	N/A	N/A	Thunderstorms knocked down trees and 80,000 homes and businesses lost power with thirty roadways closed because of downed trees. West Caln Township still had 5,000 homes and businesses without power that night. Overall, the southern half of the county was hardest hit. \$100K in damage.
November 2, 2014	Strong Wind	N/A	N/A	Strong winds knocked down weak trees, tree limbs and wires and caused scattered power outages. \$2,500 in property damage.
February 2, 2015	Strong Wind	N/A	N/A	Strong winds knocked down trees, tree limbs, and wires. In Chester County alone, about 8,000 homes and businesses lost power. \$9,000 in property damages.
June 30, 2015	Tornado (EF1)	N/A	N/A	Tornado touched down in Honey Brook Township. No injuries reported but several homes and trees were damaged. \$250K in property damage.
July 9, 2015	Thunderstorm Wind (52 kts)	N/A	N/A	Severe thunderstorms tore down numerous trees and wires across the southern tier of Chester County. \$50K in property damage.
October 9, 2015	Thunderstorm Wind	N/A	N/A	A strong thunderstorm wind gust downed multiple trees and wires along Creek Road in West Nantmeal Township \$1,000 in property damage.
April 7, 2016	Thunderstorm Wind (50 kts)	N/A	N/A	Trees were brought down by this wind gust, 1 falling on a car near the Octorara schools. These wind gusts were associated with a bowing squall line. \$4,000 in property damage.
June 5, 2016	Thunderstorm Wind	N/A	N/A	Trees were knocked down with associated road closures near Lincoln University near Oxford, PA. \$3,000 in property damage.

FEMA 2020; NOAA-NCEI 2020





FEMA Federal Emergency Management Agency
K Thousand (\$)
PEMA Pennsylvania Emergency Management Agency
M Million (\$)
mph Miles per hour

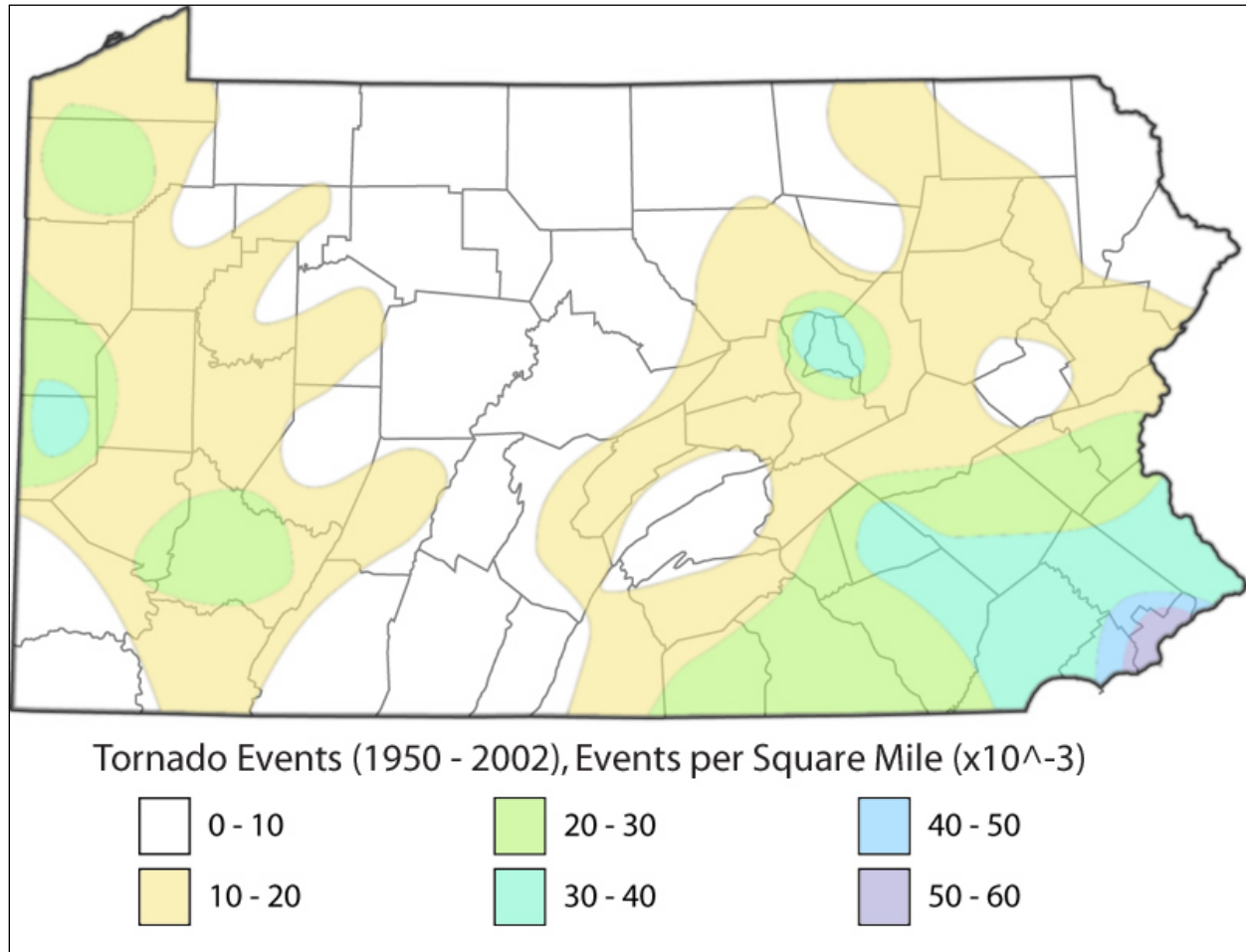
NCDC National Climatic Data Center
NOAA National Oceanic Atmospheric Administration
TSTM Thunderstorm
Kts Knots



4.3.16.4 Future Occurrence

Using data collected on events between 1950 and 2002, Figure 4.3.16-4 shows the number of total tornado events per square mile across Pennsylvania from the State Climatologist. The figure shows that a majority of Chester County experienced a higher frequency of tornado events than the central and northern portions of the Commonwealth.

Figure 4.3.16-4. Total Tornado Events Per Square Mile in Pennsylvania

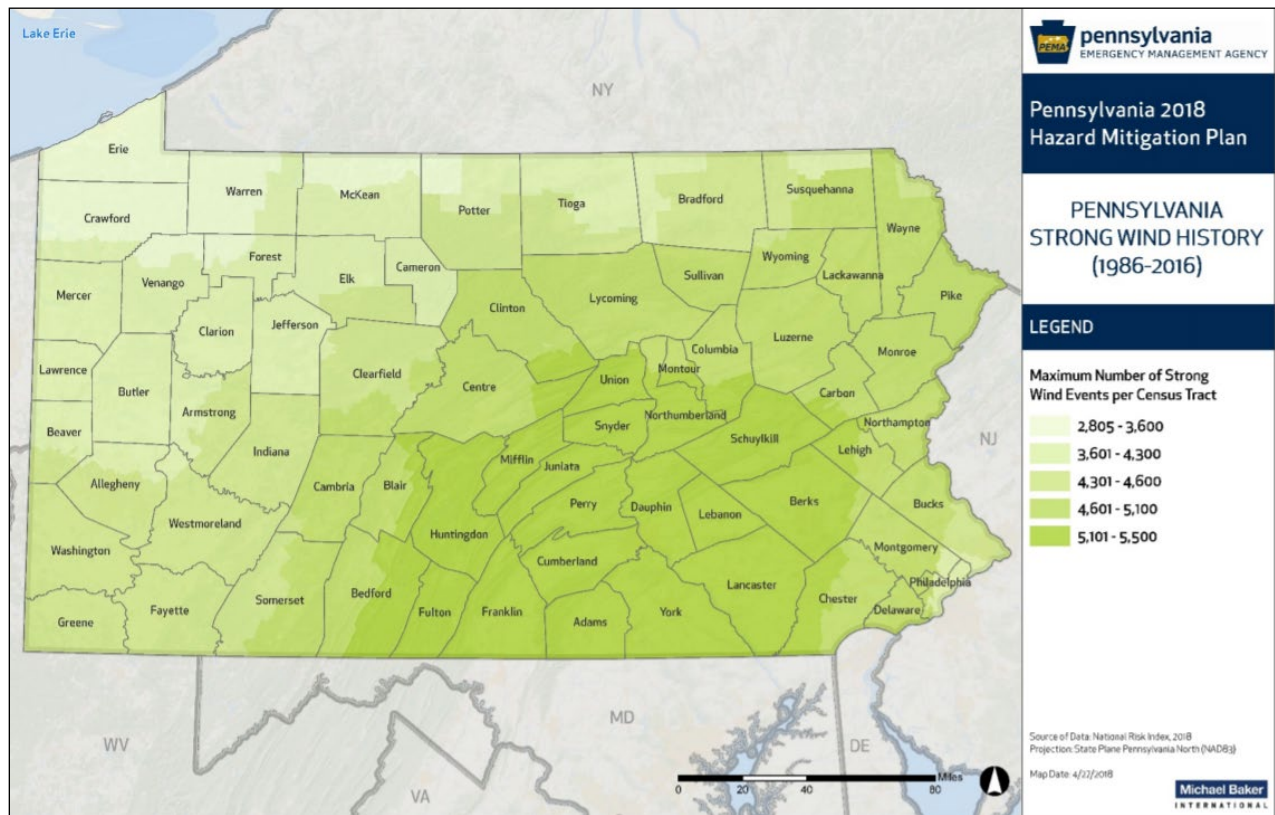


Source: Pennsylvania State Climatologist 2016

Similar to tornadoes, the Pennsylvania State Climatologist used historical data between 1950 and 2002 to show the number of wind events per square mile in the Commonwealth. The figure shows that Chester County experienced a higher frequency of events than a majority of Pennsylvania.



Figure 4.3.16-5. Maximum number of strong wind events per census tract in Pennsylvania from 1986-2016



Source: Pennsylvania State HMP 2018

For the 2021 HMP update, the most up-to-date historic data was collected to calculate the probability of future occurrence of tornado and windstorm events for Chester County. Information and data from NOAA-NCEI Storm Events database, the Pennsylvania State Climatologist, and the Storm Prediction Center were used to identify the number of tornado events that occurred between 1953 and June 2020. Table 4.3.16-5 presents the probability of future occurrence of tornado events in Chester County.

Table 4.3.16-5. Probability of Future Tornado and Windstorm Events

Hazard Type	Number of Occurrences Between 1953 and 2020	Percent chance of occurrence in any given year
Tornadoes	24	36.2%
Strong Wind	11	16.4%
Thunderstorm Wind	242	100%
High Wind	7	10.4%
TOTAL	284	100%

Sources: NOAA-NCEI 2020

In Section 4.4, the hazards of concern identified for Chester County are ranked according to relative risk. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. The probability of occurrence for severe tornado and windstorm events in Chester County is considered *likely* (between 50 and 90 percent annual probability) as defined by the Risk Factor Methodology probability criteria (Section 4.4).



Chester County experiences strong winds on a frequent basis, and when those winds occur, they can result in significant property damage, downed trees, and utility outages. It can be reasonably assumed that future tornadoes will be similar in nature to those that have affected Chester County in the past. It is estimated that the county will continue to experience direct and indirect impacts of annual windstorms and tornadoes that may induce secondary hazards, such as infrastructure deterioration or failure; utility failures; power outages; water quality and supply concerns; and transportation delays, accidents, and inconveniences.

4.3.16.5 Vulnerability Assessment

To understand risk, a community must evaluate assets exposed and vulnerable within the identified hazard area. The following section discusses potential impacts of the tornado hazard on Chester County, including:

- Impacts on (1) life, health, and safety; (2) general building stock and critical facilities; (3) the economy; (4) the environment; and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist in understanding this hazard over time.

A qualitative assessment on potential impacts to life, health, and safety; buildings and critical facilities; and the economy are summarized below. Refer to Section 4.3.7 (Hurricane and Tropical Storms) for further details on estimated potential losses as a result of the 100- and 500-year mean return period wind events using HAZUS-MH v4.2.

Impact on Life, Health, and Safety

Impacts of a tornado or windstorm on life, health, and safety depend on several factors, including severity of the event and whether adequate warning time was provided to residents. All residents in Chester County are exposed to the tornado hazard.

Residents may be displaced or require temporary to long-term sheltering. In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life. Similar to other natural hazards, socially vulnerable populations are most susceptible based on a number of factors, including their physical and financial ability to react or respond during a hazard, and locations and construction quality of their housing. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact on their family and may not have funds to evacuate. The population over the age of 65 is also more vulnerable and, physically, they may have more difficulty evacuating. The elderly is considered most vulnerable because they may require extra time or outside assistance during evacuations and are more likely to seek or need medical attention that may not be available due to isolation during a storm event. Section 2 (County Profile) presents the statistical information regarding these populations in the county. First responders' safety is also at risk during on-scene operations and they may have limited access to roads to respond to incidents. First responders may experience a higher than normal call volume and demand and have additional duties such as traffic control.

Impact on General Building Stock and Critical Facilities

While the chance of being affected by a tornado is small, the damage that results when a tornado occurs can be devastating. An EF4 tornado can carry wind velocities of 200 mph, resulting in a force of more than 100 pounds per square foot of surface area. This is a “wind load” that exceeds the design limits of most buildings.

The entire county's building stock and critical facilities are exposed to the tornado hazard. Manufactured housing (i.e., mobile homes) is particularly vulnerable to high winds and tornadoes. The U.S. Census Bureau defines manufactured homes as “movable dwellings, 8 feet or wider and 40 feet or more long, designed to be towed on its own chassis, with transportation gear integral to the unit when it leaves the factory, and without need of a permanent foundation (US Census 2010).” They can include multi-wide types and expandable manufactured homes but exclude travel trailers, motor homes, and modular housing. Because of their lightweight and often unanchored design, manufactured housing is extremely vulnerable to high winds and will generally sustain the most damage.



Table 4.3.16-6 displays the number of manufactured housing units per municipality in Chester County.

Table 4.3.16-6. Manufactured Housing Units per Municipality in Chester County

Municipality	Number of Manufactured Homes	Municipality	Number of Manufactured Homes
Atglen Borough	3	North Coventry Township	35
Avondale Borough	4	Oxford Borough	32
Birmingham Township	0	Parkesburg Borough	2
Caln Township	18	Penn Township	282
Charlestown Township	0	Pennsbury Township	0
Coatesville City	2	Phoenixville Borough	0
Downingtown Borough	1	Pocopson Township	2
East Bradford Township	2	Sadsbury Township	122
East Brandywine Township	45	Schuylkill Township	188
East Caln Township	65	South Coatesville Borough	2
East Coventry Township	160	South Coventry Township	16
East Fallowfield Township	139	Spring City Borough	2
East Goshen Township	0	Thornbury Township	0
East Marlborough Township	4	Tredyffrin Township	0
East Nantmeal Township	10	Upper Oxford Township	56
East Nottingham Township	251	Upper Uwchlan Township	0
East Pikeland Township	14	Uwchlan Township	55
East Vincent Township	133	Valley Township	130
East Whiteland Township	162	Wallace Township	19
Easttown Township	0	Warwick Township	52
Elk Township	72	West Bradford Township	288
Elverson Borough	6	West Brandywine Township	349
Franklin Township	27	West Caln Township	857
Highland Township	42	West Chester Borough	0
Honey Brook Borough	41	West Fallowfield Township	87
Honey Brook Township	838	West Goshen Township	64
Kennett Square Borough	4	West Grove Borough	5
Kennett Township	0	West Marlborough Township	6
London Britain Township	1	West Nantmeal Township	110
London Grove Township	206	West Nottingham Township	491
Londonderry Township	88	West Pikeland Township	0
Lower Oxford Township	102	West Sadsbury Township	112
Malvern Borough	1	West Vincent Township	0
Modena Borough	8	West Whiteland Township	18
New Garden Township	181	Westtown Township	0
New London Township	33	Willistown Township	0
Newlin Township	20	Chester County	6065

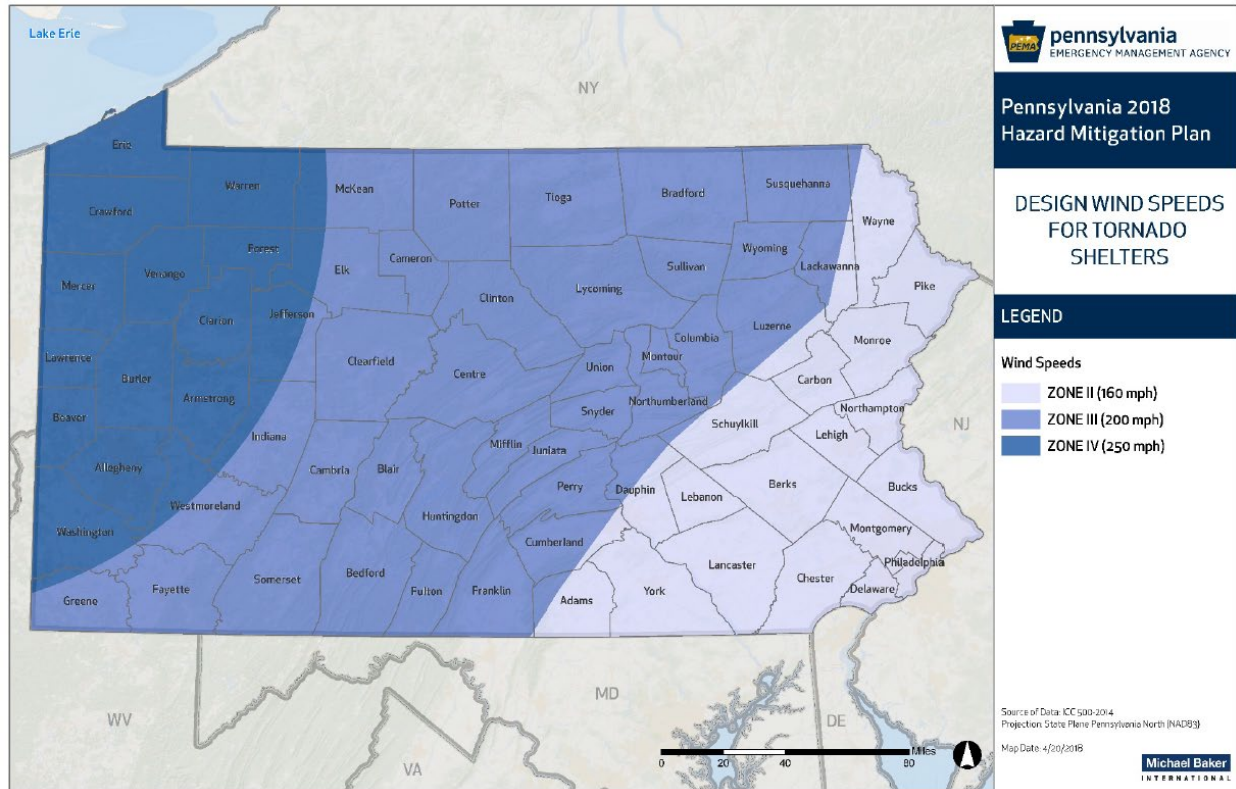
Source: Chester County GIS 2020





According to the 2018 State HMP, wind speed zones have been developed when designing tornado shelters; refer to Figure 4.3.16-6. As displayed, Chester County is located in wind speed Zone I, meaning design wind speeds for shelters and critical facilities should withstand 3-second gusts up to 160 mph, regardless if the wind is from a tornado, hurricane, tropical storm, or windstorm event. It should be noted that these wind speeds represent the strongest anticipated throughout the Commonwealth and are not the normal wind speeds expected statewide (PEMA 2018).

Figure 4.3.16-6. Design Wind Speeds for Tornado Shelters



Source: PEMA 2018

Impact on Economy

Tornadoes also impact the economy, including loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, and wage loss and rental loss due to repair/replacement of buildings. Impacts on transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could sustain damage and impacts could result in loss of power, which could also affect business operations and provision of heating or cooling to the population.

Impact on the Environment

Tornado events are typically localized; therefore, environmental impacts are rarely widespread. Severe damage to plant species is likely from both tornado and windstorm events. This includes uprooting or total destruction of trees, and increased threat to wildfire in areas of tree debris. Hazardous material facilities should meet design requirements for the wind zones identified in Figure 4.3.16-6 above (PEMA 2018).



Future Growth and Development

As discussed in Section 4.4 (Hazard Vulnerability Summary), areas targeted for future growth, development and re-development have been identified across Chester County. Any areas of growth could be affected by the tornado and windstorm hazard because the entire county is exposed and potentially vulnerable to the wind hazard. Residential development, specifically manufactured homes, may be considered more vulnerable to the tornado hazard.

Effect of Climate Change on Vulnerability

An increase in storms will produce more wind events and may increase tornado activity. Additionally, an increase in temperature will provide more energy to produce storms that generate tornadoes (Climate Central 2016). With an increased likelihood of strong winds and tornado events, all of the county’s assets are at risk for losses as a result of extreme wind events.

Additional Data and Next Steps

In time, HAZUS versions will be released with modules that address straight-line wind and tornado events. As updated versions of are released, the county will be able to run analyses for an overall picture of the wind damages and debris generated from tornado events. Over time, Chester County can obtain additional data to support the analysis of this hazard. This additional data would include details on past hazard events and impacts, and an updated building inventory that would provide specific building information, such as type of construction and details on protective features (for example, shutters and safe rooms).



4.3.17 Transportation Accident

This section describes the location and extent, range of magnitude, past occurrence, future occurrence, and vulnerability assessment for the transportation accident hazard for the Chester County Hazard Mitigation Plan (HMP).

Transportation hazards include hazardous materials in transit (Section 4.3.4), vehicular accidents, aviation accidents, at-grade railroad crossings, and roadways vulnerable to floods. A transportation hazard may be defined as a condition created by movement of anything by common carrier. Transportation hazards can be divided into two categories: hazards created by the material being transported, and hazards created by the transportation medium. Transportation systems available in Chester County include roadways, railways, three public airports, and several private airstrips. A major road accident in the county is probable; however, aviation or rail accidents are unlikely. All county systems and supporting transportation resources provide services locally, regionally, and nationally. Transportation accidents defined below include incidents involving road, air, and rail travel.

- **Vehicular Accidents:** A vehicular accident is an incident that usually involves one vehicle colliding with another vehicle or other road user, such as an animal or a stationary roadside object. A vehicular accident may result in injury, property damage, or possible fatalities. Many factors contribute to vehicular accidents, including equipment failure, poor road conditions, weather, traffic volume, and driver behavior.
- **Aviation Accidents:** According to the International Civil Aviation Organization, an aviation accident is an occurrence during operation of an aircraft from the time a person boards the aircraft with intent to fly to a destination, to the time the person has disembarked the aircraft. Three different situations qualify as an aviation accident: a person is fatally or seriously injured; the aircraft sustains damage or structural failure; or the aircraft is missing or inaccessible. An aviation incident is an occurrence, other than an accident, associated with operation of an aircraft that affects or could affect the safety of operation (International Civil Aviation Organization 2015).

Chester County has three public airports and several private airfields and heliports. The three public airports include Chester County G.O. Carlson Airport, New Garden Airport, and Brandywine Regional Airport. Privately owned airports and heliports include the following:

- Altermose Ultralight
- Bentley Airport
- Cohen Airport
- Feters Construction Airport
- Harris Airport
- Kolb Airport
- Lance Airport
- Whittle Airport
- Black Swan Farm Heliport
- Braehead Heliport
- Brandywine Hospital Heliport
- Chester County Hospital Heliport
- Coatesville Heliport
- E L Gruber Heliport
- Exton Heliport
- Haig-K Heliport
- Indian Sleep Farm Heliport
- Jennersville Regional Hospital Heliport
- Keystone Heliplex Heliport
- Marlboro Corporate Park Heliport
- Mbb Heliport
- Mikes Heliport
- Paoli Memorial Hospital Heliport
- PECO Berwyn Heliport
- Ransome Heliport
- RJD Heliport
- Siepers Eye Port Heliport
- Siple Heliport
- Starwbridge Clothier Exton Heliport
- US Army Reserve Center Heliport



- **Hazardous Materials (HazMat) in Transit:** A HazMat is defined as a substance or material determined capable of posing an unreasonable risk to health, safety, or property when transported. “Unreasonable risk” covers a broad range of health, fire, and environmental considerations. HazMats come in various forms, some of which can cause death; serious injury; long-lasting health effects; and damage to buildings, homes, and other property. HazMat substances include explosives, flammable solids, substances that become dangerous when wet, oxidizing substances, and toxic liquids. An accident involving a vehicle carrying HazMats becomes a HazMat incident if the HazMat leaks; is involved in a fire; or if the potential for release, fire, or other hazard exists. Hazards can occur during production, storage, transportation, use, or disposal of HazMats (Illinois Emergency Management Agency 2012).
- **Railway Accidents:** Railway accidents involve one or more trains. They can involve a train derailment or one train impacting another train, vehicle, or pedestrian. Presently, a total of 264.6 miles of rail lines are located within Chester County. Of this total, 259.2 miles of rail line are considered active.

Chester County’s rail line system includes:

1. SEPTA
2. PAAC
3. Amtrak
4. Conrail
5. Octoraro Railroad
6. Canadian Pacific Rail
7. East Penn Railroad
8. Brandywine Valley Railroad

Passenger rail services include Southeastern Pennsylvania Transportation Authority (SEPTA) – Rapid Transit, Trolley and Light Rail, and Commuter Rail; the Port Authority of Allegheny County (PAAC) – Light Rail; and Amtrak – Intercity Passenger Rail.

The county also has the West Chester Railroad Company, owned by 4 States Railway Service, Inc, that was restored and is used as a tourist attraction.

4.3.17.1 Location and Extent

Vehicular Accidents

Chester County is home to several major east-west roadways, including the Pennsylvania Turnpike (I-76), US-30, US-322, and Route 3. US-1 is a major north–south U.S. Highway, extending from the Florida Keys in the south to the Canadian border in the north. In the United States, it extends from the Maryland state line near Nottingham to the New Jersey state line near Trenton, through the southeastern portion of Pennsylvania. Chester County as a whole, is at risk for traffic accidents of all degrees.

Additional major roadways in Chester County include PA-3, PA-10, PA-23, PA-29, and PA-100, PA-272. Chester County has approximately 4,454 miles of roadways, divided as listed in Table 4.3.15-1, and illustrated on Figure 4.3.17-1. Transportation accidents can occur at any point along these roadways, with many occurring at an intersection of two or more roadways.

Table 4.3.17-1. Chester County Transportation Network

Road Type	Total Miles for County
Local and Private Roads	3,794





Road Type	Total Miles for County
State Routes	374
US Highways	229
Interstate	58
Chester County (Total)	4,454

Sources: PennDOT 2018

Structurally deficient bridges also pose a risk for transportation accidents. In response to the collapse of the I-35W Bridge in Minneapolis in August 2007, PennDOT assessed the structural integrity of all bridges in the Commonwealth. Table 4.3.17-2 lists the total number of bridges in Chester County, as well as the number of those that are structurally deficient (in parentheses).

Table 4.3.17-2. Bridges in Chester County

On State Roads	On Local Roads
666 (88)	230 (57)

Source: PennDOT 2018

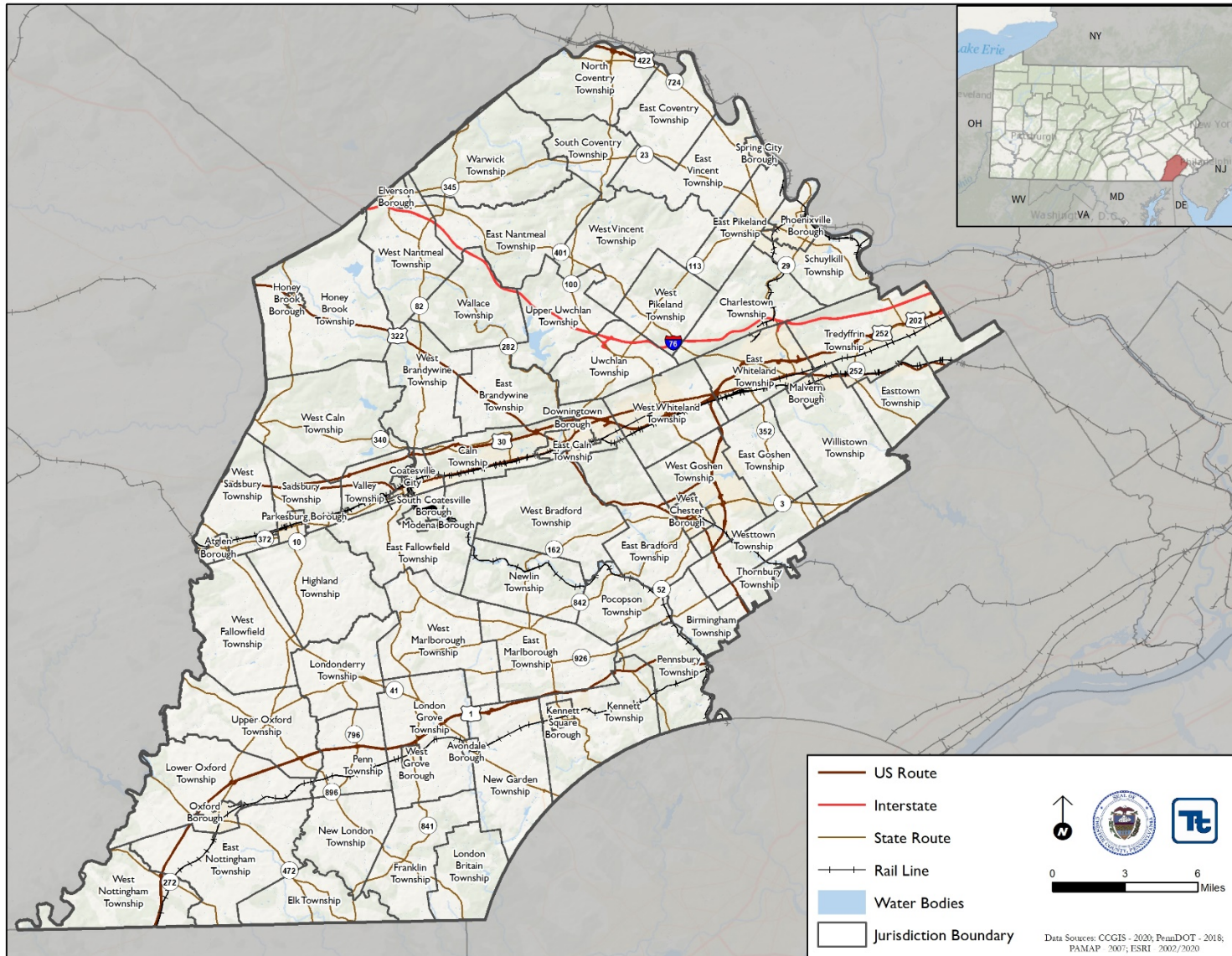
There is no warning time for a vehicular accident. Factors are typically associated with the driver, vehicle, and the environment. Factors associated with the driver include error, speeding, lack of experience, and blood-alcohol level. Factors associated with the vehicle include type, condition, and center of gravity. Environmental factors include quality of the infrastructure, weather, and obstacles. The majority of vehicular accidents are attributed to the driver. Vehicular accidents can severely affect those directly involved, as well as others not directly involved. Other effects may include severe traffic delays, lost sales to businesses, delayed commodity shipments, and increased insurance costs (Cova and Conger 2004).

County and local officials identified the following areas as especially problematic for transportation accidents and congestion:

- US 202 Sections 100 and 200
- PA 10 Corridor
- Goshen Road at Del Chester Road
- PA 113/US 30 Bypass to Peck Road
- PA 23 Corridor/Phoenixville
- US 30 at PA 82
- US-1 Bypass
- PA 41
- PA 100/US 30 Bypass
- PA 82 at PA 340



Figure 4.3.17-1. Major Transportation Routes in Chester County





Railway Accidents

Pennsylvania offers freight, passenger, and commuter rail services. In its 2035 Intercity Passenger and Freight Rail Plan, the Pennsylvania Bureau of Rail Freight, Ports, and Waterways cites that the freight rail network totals 5,095 miles of track with over 60 railroads, making Pennsylvania the fifth-largest rail network in the nation and the state with the greatest number of railroads. Three railroad systems offer Pennsylvania passenger service: (1) Southeastern Pennsylvania Transportation Authority (SEPTA) – Rapid Transit, Trolley and Light Rail, and Commuter Rail; the Port Authority of Allegheny County (PAAC) – Light Rail; and Amtrak – Intercity Passenger Rail. Amtrak is the only rail service that crosses the entire commonwealth.

Rail accidents generally fit into one of three categories (PEMA 2020):

- Derailment – the train leaves the rails
- Collision – a train strikes another train or a vehicle
- Other – including objects on the rails, fires, or explosions.

Aviation Accidents

Chester County contains three public airports, the Chester County G.O. Carlson Airport, New Garden Airport, and Brandywine Regional Airport as well as several private air strips. In addition, aircraft traveling the major air route between Wilmington and Philadelphia International Airports travel over Chester County.

Approximately 80 percent of all aviation accidents occur shortly before or during take-off and landing. Reportedly, most of these accidents are caused by human error. Mid-flight accidents are rare but not unheard of. A survey of 1,843 plane crashes between 1950 and 2006 showed that 53 percent were the result of pilot (human) error, 21 percent were caused by mechanical failure, 11 percent were caused by weather, 8 percent were attributed to other human error (lack of communication or improper maintenance), 6 percent were caused by sabotage and terrorism, and 1 percent resulted from other causes (Krasner 2009).

Aviation accidents are often devastating incidents that may result in serious injuries or fatalities. The Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) are responsible for monitoring air travel and investigating accidents. Some of the most common causes of aviation accidents occur as a result of violations of FAA and NTSB regulations. Other causes of aviation accidents include, but are not limited to, those listed below.

- Pilot or flight crew errors – Pilot error is the number one cause of aviation accidents and accounts for the highest number of fatalities. Pilots have the responsibility to transport passengers safely from one place to another and follow the FAA and NTSB regulations to better ensure passenger safety. If a pilot or flight crew member makes an error, an accident may occur.
- Faulty equipment – Faulty aircraft equipment is another common cause of aviation accidents.
- Aircraft design flaws – The manufacturer of an aircraft is responsible for an aviation accident if the structural design is flawed and results in an accident.
- Failure to properly fuel or maintain the aircraft – If any regulations and safety standards set by the FAA or NTSB are violated, an accident may occur.
- Negligence of Federal Air Traffic Controllers – Failure of air traffic controllers to properly monitor the airways is another cause of aviation accidents (*Aviation Law News* no date).

4.3.17.2 Range of Magnitude

Roadway accidents in Chester County range from minor crashes to more serious incidents that involve injuries or fatalities or result in a release of HazMats (described further in Section 4.3.4). One of the worst recent transportation-related incidents in the county occurred in New Garden Township on Thursday October 16, 2019, when a multi-passenger van carrying 11 people overturned on Route 1 killing three people and injuring eight.



Rail accidents can vary widely in terms of injuries, fatalities, property damage, and interruption of service, depending on the nature and severity of the accident.

Aircraft accidents can vary from a single-engine aircraft having a “hard landing” causing damage to the aircraft, to a crash of a small turboprop or jet aircraft, to a crash of a large jet (such as a Boeing 727). Other aircraft accidents could include helicopter or experimental aircraft crashes. Aviation accidents can also involve radio-controlled or drone aircraft devices, many of which are experimental and not subject to defined regulatory oversight, potentially complicating issues that could arise if one of these devices crash.

A worst-case transportation accident scenario within the county would be the overturn of a tractor-trailer carrying an extremely hazardous substance (described in Section 4.3.4) resulting in a massive release of its cargo on a major roadway. This incident would block traffic on Chester County’s major transportation routes and could threaten the health and safety of individuals on the roadways and in surrounding neighborhoods. In addition, a release could necessitate closure of critical county facilities near the accident. The most likely transportation accident in the county would involve a single vehicle hitting an object and sustaining minimal damage.

4.3.17.3 Past Occurrence

Major roadway accidents (such as multi-vehicle accidents, those that close roads or bridges, or those involving school buses) are reported by Chester County to PennDOT. Table 4.3.17-3 summarizes these accidents from 2015 to 2019. While this table lists accidents reported to the counties and Commonwealth, significantly more minor accidents are not reported.

Table 4.3.17-3. Summary of Major Roadway Accidents in Chester County, 2015 to 2019

Year	Vehicle Accidents	Railroad Incidents	Aircraft Accidents	Fatalities
2015	4,939	4	1	37
2016	4,892	7	2	24
2017	4,780	7	1	35
2018	4,926	7	0	46
2019	4,720	8	0	29
Total	24,257	33	4	171

Source: PennDOT 2020; Federal Railroad Association 2020; Aviation Data Base 2020

4.3.17.4 Future Occurrence

Transportation hazards are impossible to predict accurately; however, areas prone to these hazards can be located, quantified through analysis of historical records, and plotted on county-wide and municipality base maps. Areas with certain characteristics that contribute to these hazards or increase vulnerability to these hazards can be identified.

Assuming that transportation accidents are as likely to occur in the future as they have occurred in the past, and based on the available data, Chester County can expect the following each year:

- Approximately 24,257 major vehicle accidents. (The actual number of vehicle accidents in Chester County may be much higher; however, this figure is based on vehicle accidents captured from PennDOT from 2015-2019.)
- Four aircraft incidents
- Thirty-three railroad incidents





Based on the Risk Factor Methodology Probability Criteria, the probability of a transportation accident in the categories listed above is considered to be *highly likely* (see Table 4.4-1).

4.3.17.5 Vulnerability Assessment

The entire county has been identified as the hazard area for transportation accidents. This section evaluates and estimates the potential impact of transportation hazards on Chester County in the following sections:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impacts on: (1) life, safety, and health; (2) general building stock; (3) critical facilities; (4) the economy; and (5) future growth and development
- Further data collections that will assist in understanding this hazard over time

Overview of Vulnerability

Several types of county transportation rely on use of roadways. Hazards associated with transportation can include natural hazards affecting the roadway, type of material being transported, or hazards pertaining to the transportation medium itself. Multiple major roadways (interstates and other major highways) within the county are used by residents and commuters, and these are means for transporting all types of materials, including HazMats. A major accident on any of these major roadways is possible and could minimally or severely affect the county.

Data and Methodology

Data were obtained from the county, local officials, and federal data sources on this hazard. In addition, the Planning Team has identified roadways within the county that are vulnerable to other natural hazards (such as flooding).

Impact on Life, Health, and Safety

Transportation hazards could lead to potential losses in categories of human health and life, property, and natural resources. Vehicular accidents, flooded roadways, and other roadway impairments may result in injury or death to drivers and passengers on the road, the public in the immediate vicinity, and emergency services personnel. The number of people exposed to a hazard depends on population density, whether exposure occurs during day or night, and percentage of the population in the accident area located indoors and outdoors.

The county and its municipalities are prepared to manage and respond to transportation hazards. However, the risk to first responders increases when they respond to transportation accidents near trafficked areas. First responders may also have to take on the additional duty of controlling traffic.

Impact on General Building Stock, Critical Facilities, Economy and Future Development

Because of insufficient data, a full loss estimate was not completed for the transportation hazard. Loss of roadway use, and public transportation services would affect thousands of commuters, employment, day-to-day operations within the county, and delivery of critical municipal and emergency services. Disruption of one or more of these modes of transportation can lead to congestion of another and affect both the county and the region as a whole. As discussed in Section 2.4 of this HMP, areas targeted for future growth and development have been identified across Chester County. Increased development in the county and region will lead to increased road traffic.

Additional Data and Next Steps

Based on limited data regarding the probability and potential impact of this hazard, a quantitative loss estimate was not completed for this HMP. Over time, the county can work with appropriate agencies to collect additional



Section 4.3.17: Risk Assessment– Transportation Accident

data to support mitigation planning, consideration of potential risks, and prioritization of mitigation measures for this hazard.

Chester County recognizes it must compile and maintain data regarding specific concerns and past losses from this hazard. These data should include specific information regarding damage or loss of life, property, or infrastructure; and any reports pertaining to potential or actual cost and logistics of responding to an event caused by this hazard (locations of road closures, map detours, traffic counts, durations of closures and detours; and costs to respond). These data will be included in future revisions of the HMP and can be used to support future mitigation grant efforts (benefit-cost analysis).

Studying traffic and potential transportation accident patterns could provide information on vulnerability of specific road segments and nearby populations. Increased understanding of the types of HazMats transported through the county will also support mitigation efforts. Maintaining a record of frequently transported materials can facilitate development of preparatory measures to respond to a release. Predicting costs needed to respond to a release, remediate the environment (see Section 4.3.4 for a discussion of environmental impacts due to transportation accidents), or repair damaged infrastructure would be useful in developing future mitigation options.



4.3.18 Utility Interruption

A utility interruption could include power failure, potable water service outage, telecommunications infrastructure failure, natural gas infrastructure failure, or sewer infrastructure failure. For the purpose of this plan, utility interruption focuses on power failure, because it is the major cause of utility failure and has had widespread impacts on Chester County. A power failure is defined as any interruption or loss of electrical service from disruption of power transmission caused by accident, sabotage, natural hazards, or equipment failure. A significant power failure is defined as any incident of a long duration that would require the involvement of the local or state emergency management organizations to coordinate provision of food, water, heating, cooling, and shelter. Interruptions in other basic utilities (such as data/telecommunications, water, natural gas, or sewer) can have a detrimental impact on Chester County. Utilities that employ aboveground wiring (power and data/telecommunications) are vulnerable to the effects of other hazards such as high wind, heavy snow, ice, rain, and vehicular accidents.

This section describes the location and extent, range of magnitude, past occurrence, future occurrence, and vulnerability assessment for the utility interruption hazard for the Chester County Hazard Mitigation Plan (HMP).

4.3.18.1 Location and Extent

Utility interruptions occur throughout Chester County, but are usually of small scale and short duration. Utility interruptions in Chester County are primarily power failures and are often a secondary impact of another hazard event. For example, severe thunderstorms or winter storms could bring down power lines and cause widespread disruptions in electricity service. Strong heat waves may result in rolling blackouts causing loss of power for an extended period. Local outages may be caused by traffic accidents or wind damage.

Local companies—such as Pennsylvania Power and Light (PPL) Corporation, which provide electricity to Chester County—are capable of handling minor interruptions (Section 4 of this plan describes other utilities in the county). Interruptions are possible anywhere utility service has been installed. Some utility facilities are especially vulnerable. For instance, potable water interruption is possible when water intakes and many water control facilities are in the 1-percent annual chance floodplain. A flood of this magnitude may seriously impair water service. Section 4.3.6 provides more detail on possible flood impacts.

4.3.18.2 Range of Magnitude

Generally speaking, the most severe utility interruptions are regional power outages. Regional loss of power affects lighting; heating, ventilation, and air conditioning (HVAC) and other support equipment; communications; fire and security systems; and refrigeration, which can in turn cause loss of water and sewer service, and food spoilage. These effects are especially severe for individuals with functional needs and the elderly.

At a minimum, power outages can cause short-term disruption in the orderly functioning of businesses, government operations, and private citizen functions and activities. Examples of everyday functions that would be affected by power outages include traffic signals, elevators, and retail sales. A worst-case scenario for utility interruption in Chester County would be a countywide power outage during winter months, forcing the evacuation of vulnerable populations.

Sabotage also plays a role in some utility outages. Sabotage may be the direct result of a malicious attack against utilities or may be the secondary effect of the theft of copper wiring. In a report published in October 2010 titled “An Updated Assessment of Copper Wire Theft from Electric Utilities,” the U.S. Department of Energy’s (DOE)



Office of Electricity Delivery and Energy Reliability reported that United States-based utilities suffer copper thefts costing several million dollars annually (DOE 2010). The estimated 456,000 minutes of outages have been experienced by utilities nationwide as a result of copper theft, or about 7,600 hours (American Public Power Association [APPA] 2012).

4.3.18.3 Past Occurrence

Every year, Chester County is susceptible to minor utility interruptions either through technological failure or as the result of inclement weather. Table 4.3.18-1 below shows major utility interruptions in the county since 2002. In all, the county experienced over 75 incidents that included downed utility lines from 2002 to July 2017. Events that simply included downed trees and power lines are not listed in Table 4.3.18-1.

Table 4.3.18-1. Utility Interruptions from 2002–2017

Dates of Event	Event Type	Losses / Impacts
April 19, 2002	Thunderstorm, Wind	Severe thunderstorms tore down trees and power lines in East Pikeland Township in the northeast part of Chester County, and Kenneth Square Borough and West Goshen Township in the southeast part of the county. PECO Energy reported about 2,600 of its customers lost power in Chester and Delaware Counties.
May 12, 2002	Thunderstorm Winds	A severe thunderstorm knocked down large tree limbs and wires from West Chester east to the Delaware County border. Philadelphia Electric Company (PECO Energy) reported about 13,000 of its customers lost power in Chester and Delaware Counties.
May 13, 2002	Thunderstorm Winds	PECO Energy reported about 2,600 of its customers lost power in Chester County.
May 14, 2002	Thunderstorm Winds	PECO Energy reported about 37,700 of its customers lost power in Chester and Delaware Counties.
June 27, 2002	Thunderstorm Winds	PECO Energy reported about 20,000 of its customers lost power because of the thunderstorms in their southeastern Pennsylvania service area, including Chester County.
July 5, 2003	Thunderstorm Winds	PECO Energy reported about 79,000 of its customers lost power in its service area, including Chester County.
September 23, 2003	Thunderstorm Winds	PECO Energy reported about 28,000 of its customers lost power in Chester and Delaware Counties. All power was restored by the afternoon of the September 24.
May 2, 2004	Thunderstorm Winds	PECO Energy reported 20,301 homes and businesses lost power.
August 4, 2004	Thunderstorm Wind	A squall line of severe thunderstorms knocked down several trees throughout Chester County. About 8,500 homes and businesses lost power in Chester and Delaware Counties.
November 25, 2004	Thunderstorm Wind	In Kenneth Square, three spans of power lines and two poles were knocked down. PECO Energy reported about 11,000 homes and businesses lost power in their service area.
May 28, 2005	Thunderstorm Wind	PECO Energy reported about 20,000 of its customers lost power because of the severe thunderstorms in its southeastern Pennsylvania service area, with Chester and Bucks Counties reporting the most outages.
June 6, 2005	Thunderstorm Wind	PECO Energy reported about 60,000 homes and businesses lost power throughout its southeastern Pennsylvania service area, including Chester County.
July 8, 2005	Flash Flood	About 2,500 homes and businesses lost power throughout southeastern Pennsylvania.
July 27, 2005	Thunderstorm Wind	About 10,000 homes and businesses lost power in the county. Power was not totally restored until July 28.



Dates of Event	Event Type	Losses / Impacts
July 18, 2006	Thunderstorm Wind	A severe thunderstorm caused considerable wind damage throughout Chester County as well as the death of two people. Thousands of trees were damaged and most of the power was not restored in the county until the weekend of July 22 and 23. PECO Energy reported 180,253 customers lost power in Chester County. Overall, 482,068 customers lost power, the largest outage ever for a thunderstorm event in their history and the largest outage for the utility since Isabel in 2003.
August 29, 2006	Thunderstorm Wind	A severe thunderstorm tore down large tree limbs and wires in Charlestown Township. PECO Energy reported about 8,500 homes and businesses in southeastern Pennsylvania lost power, including Chester County.
April 15, 2007	Heavy Rain	PECO Energy reported about 80,000 of its southeastern Pennsylvania customers lost power. More than 50 major roads were closed in southeastern Pennsylvania because of downed trees. In Southeastern Pennsylvania, five SEPTA Regional Rail Service Lines had service interruptions on the 16th. Pennsylvania Power and Light reported about 77,000 of its customers lost power in Eastern Pennsylvania and about 65,000 homes and businesses lost power in the Lehigh Valley.
May 27, 2007	Thunderstorm Wind	Pennsylvania Power and Light reported about 10,000 of its customers in the Lehigh Valley and the northern Philadelphia suburbs in Montgomery and Bucks Counties lost power.
June 10, 2008	Thunderstorm Wind	A severe thunderstorm left 55,000 homes and businesses without power in the county and 18,000 still were without power the next day.
July 23, 2008	Thunderstorm Wind	Most of the wind and lightning damage occurred in southeastern Pennsylvania where PECO Energy reported about 35,000 homes and businesses lost power.
July 27, 2008	Hail	The combination of lightning and damaging winds caused about 62,000 homes and businesses to lose power. Most of the outages (about 49,000) were in PECO Energy's service area in southeast Pennsylvania.
June 9, 2009	Hail	PECO Energy reported about 10,000 homes and businesses lost power that morning in southeastern Pennsylvania.
August 2, 2009	Thunderstorm Wind	PECO Energy reported about 54,000 of its southeastern Pennsylvania customers lost power due to the lightning and damaging winds.
June 24, 2010	Thunderstorm Wind	Nearly 80,000 homes and businesses lost power and it took until June 28 for power to be fully restored.
July 25, 2010	Thunderstorm Wind	About 60,000 homes and businesses lost power, with the greatest concentration in Lehigh County in the Lehigh Valley and Chester County in southeastern Pennsylvania.
June 9, 2011	Thunderstorm Wind	The combination of damaging winds and lightning caused about 3,500 homes and businesses to lose power throughout Chester County.
August 28, 2011	Flash Flood	About 500,000 PECO Energy and 420,000 PPL customers lost power in eastern Pennsylvania. For both utilities this ranked within the top five outages of all time. Preliminary damage estimates were around \$6 million.
July 7, 2012	Hail	Pennsylvania Power and Light reported about 67,500 of its customers lost power. It took until July 10 for full restoration.
July 26, 2012	Thunderstorm Wind	Over 17,000 homes and businesses lost power because of downed trees, tree limbs and wires. More than 10,000 still did not have power on the morning of July 27.
September 18, 2012	Thunderstorm Wind	The combination of the strong winds and squall line knocked out power to approximately 85,000 homes and businesses in eastern Pennsylvania.
October 29, 2012	Flood	PECO Energy, which serves customers in southeastern Pennsylvania, broke their all-time outage record of 850,000 customers without power.
June 25, 2013	Thunderstorm Wind	PECO Energy reported about 5,000 homes and businesses lost power.
November 1, 2013	Thunderstorm Wind	PECO Energy reported about 1,700 of its customers lost power in Chester County.
February 3, 2014	Heavy Snow	Many municipalities declared snow emergencies. Approximately 60,000 PECO Energy customers lost power in the Philadelphia metropolitan area.



Dates of Event	Event Type	Losses / Impacts
February 4, 2014	Ice Storm	In Chester County, whole municipalities lost power, as did 87 percent of the county overall.
June 19, 2014	Lightning	About 30,000 homes and businesses lost power in the county.
July 3, 2014	Thunderstorm Wind	PECO Energy reported about 59,000 of its customers in Chester County lost power.
July 8, 2014	Thunderstorm Wind	Approximately 80,000 homes and businesses lost power with 30 roadways closed because of downed trees. Chester County had about a third (17,000) of the remaining southeast Pennsylvania outages on the afternoon of the 9th. West Caln Township still had 5,000 homes and businesses without power that night.
November 2, 2014	Strong Wind	About 22,600 homes and businesses lost power, 20,000 in PECO Energy's service area in southeastern Pennsylvania.
February 1, 2015	Winter Weather	Winds caused about 8,000 homes and businesses to lose power in southeast Pennsylvania.
February 15, 2015	Strong Wind	PECO Energy reported that 13,000 of its customers lost power. PPL reported 1,600 of its customers in the Poconos lost power. Winds also ushered into eastern Pennsylvania one of the coldest air masses of the entire winter season.
March 5, 2015	Heavy Snow	PECO Energy reported 3,000 of its customers lost power.
June 23, 2015	Thunderstorm Wind	In Chester County, close to 75,000 customers lost power, and Verizon Wireless cell phone service was also lost on June 23 and 24.
July 22, 2017	Thunderstorm Wind	A stalled frontal boundary was the focus for several rounds of thunderstorms that produced damaging winds and flooding in spots. Over 8,000 people lost power.

Source: NOAA NCEI 2020

4.3.18.4 Future Occurrence

Minor power failure (in other words, short outage events) may occur several times a year for any given area in the County, while major events (long, widespread outage events) take place once every few years. Power failures often occur during severe weather; therefore, they should be expected during those events. Based on the assumption that the County will experience severe weather annually, in addition to outages from other causes, the future occurrence of utility interruptions in Chester County should be considered *highly likely* as defined by the Risk Factor Methodology probability criteria.

4.3.18.5 Vulnerability Assessment

To understand risk, a community must evaluate the assets that are exposed or vulnerable in the identified hazard area. This section discusses the potential impact of the utility interruption hazard on Chester County in the following subsections:

- Impact on (1) life, health, and safety; (2) general building stock and critical facilities; (3) the economy; (4) the environment; and (5) future growth and development
- Effect of climate change on vulnerability
- Further data collections that will assist understanding of this hazard over time

Impact on Life, Health, and Safety

Utility interruptions most severely affect individuals with access and functional needs (such as children, the elderly, and individuals with special medical needs). Special medical equipment will not function without power. Likewise, a loss of air conditioning during periods of extreme heat or the loss of heating during extreme cold can be especially detrimental to those with medical needs, children, and the elderly. Table 4.3.18-2 shows the demographic change in the county for children and the elderly from 2000 through 2018. The population under the age of 5 and under 18 years have decreased, while the population over the age of 65 has increased, as shown



in Table 4.3.18-2. The population under the age of 18 has decreased by 3.5 percent. Data on individuals with special medical needs were not available. Additionally, first responders’ safety may be at risk during on-scene operations and they may not be able to respond in a timely manner due to electrical or utility fires. First responders may need to take on additional duties due to a higher than normal call volume and demand, traffic control, and responding to transportation incidents.

Table 4.3.18-2. Demographic Trends for Vulnerable Populations

Vulnerable Population	2000 Census	2010 Census	2018 Census Estimate	2000 to 2018 Change
Children under 5 years	29,251	31,126	29,076	175
Under 18 years	112,376	123,950	119,547	7,171
65 years and over	46,801	63,875	79,856	33,055

Source: U.S. Census Bureau 2020

Impact on General Building Stock and Critical Facilities

All facility infrastructure considered critical are vulnerable to utility interruptions, especially the loss of power. The establishment of reliable backup power at these facilities is extremely important to continue to provide for the health, safety, and well-being of Chester County’s population.

Impact on the Economy

No data regarding economic impacts from utility interruptions in Chester County are available. However, utility interruptions can cause economic impacts stemming from lost income, spoiled food and other goods, costs to the owners or operators of the utility facilities, and costs to government and community service groups. Calculation of potential impacts of utility interruptions is heavily dependent on the number of rate-paying utility connections affected. The Federal Emergency Management Agency (FEMA) Benefit-Cost Analysis (BCA) Toolkit v.5.3.0 has standard values based on the daily cost per rate-paying connection. The daily cost-per-connection value is shown in Table 4.3.18-3.

Table 4.3.18-3. FEMA BCA Toolkit v5.3.0 Daily Standard Values of Utility Services

Utility	Daily Value (per connection/per day)
Electric	\$148.00
Potable Water	\$105.00
Wastewater	\$49.00

Source: FEMA 2017

Impact on the Environment

The most significant impact associated with utility interruptions is when the interruption involves a release of hazardous materials. This hazardous material may be released in a pipeline accident or when a material is in transit. Section 4.3.16, Environmental Hazards, includes a complete discussion on the impacts of a hazardous materials release. Pipelines carrying flammable materials also have the possibility of exploding or starting a fire (Pennsylvania Emergency Management Agency [PEMA] 2018).

A number of secondary impacts are associated with utility interruptions. First, interruptions could affect the ability of the government to function, especially if backup power generators or supply is inadequate or



unavailable. Utility interruptions also can reduce the efficient and effective communication that is essential to first responders. Heating loss and severe cold can also impact the health and safety of at-risk populations like young children, the elderly, and individuals with disabilities (PEMA 2018).

Future Growth and Development

Areas targeted for potential future growth and development in the next 5 to 10 years have been identified across Chester County (further discussed in Section 2.4 of this HMP). Any areas of growth could be potentially impacted by the utility interruption hazard because the entire county is exposed and potentially vulnerable. An increase in development and population will increase demand for power supply and has the ability to increase the likelihood of utility interruption incidents.

Effect of Climate Change on Vulnerability

According to the Fourth National Climate Assessment, two climate-change scenarios were modeled, and temperature change in the northeastern United States is estimated to increase between 3.98 - 5.09°F by 2036-2065, and between 5.27 - 9.11°F by 2071-2100. The annual mean temperature change in Pennsylvania is projected to increase between 5.9 - 6.3°F by 2041 - 2070. Some areas of the world may experience greater temperature changes than others. It is important to note that frequency estimates may not be an accurate representation of future conditions due to the unknown impacts of climate change (PEMA 2018).

Increased average temperatures as a result of climate change make the occurrence of extreme heat more likely. While increased average temperatures would make the occurrence of extreme cold less likely, some climatologists have suggested that warming in the Arctic could impact the position of the jet stream, allowing for more extreme cold weather events to occur. While some research supports this concept, others do not and the impact of climate change on cold weather events is not fully understood (Climate Central 2013). Extreme heat and cold result in greater strain on utilities, increasing the likelihood of utility interruption.

Climatologists expect an increase in the number and intensity of severe weather events. This will include wind events such as hurricanes, tornadoes, and wind associated with thunderstorms, among other phenomena. More storms with higher winds will increase the chance that the utility infrastructure will be impacted by these storms. Additionally, climatologists expect an increase in precipitation, which could come in the form of heavy downpours or winter weather thus causing additional utility interruptions. Increased risk of drought may also threaten water utilities.

Additional Data and Next Steps

For future plan updates, Chester County can track data on power outage events and obtain additional information on past and future events, particularly in terms of any injuries, deaths, shelter needs, pipe-freeze incidents, and other impacts. These data will help to identify any concerns or trends for which mitigation measures should be developed or refined. In time, quantitative modeling of estimated power outage events may be feasible as data are gathered and improved.



4.3.19 Winter Storm

This section provides a profile and vulnerability assessment of the winter storm hazard for the Chester County Hazard Mitigation Plan (HMP).

4.3.19.1 Description

Winter storms occur, on average, approximately five times each year in Pennsylvania. From November through March, Pennsylvania is exposed to winter storms that move up the Atlantic coast or sweep in from the west. Every county in the Commonwealth is vulnerable to severe winter storms; however, the northern tier, western counties, and mountainous regions tend to experience winter weather more frequently and with greater severity.

Winter storms can produce more damage than any other severe weather event, including tornadoes. Complications caused by winter storms can lead to road closures (especially secondary and farm roads); business losses to commercial centers built in outlying areas because of supply interruption and loss of customers; property losses and roof damages from snow and ice loading and fallen trees; utility interruptions; and loss of water supplies. Flooding can result from winter storm events as well.

Most severe winter storm hazards include heavy snow (snowstorms), blizzards, sleet or freezing rain, ice storms, and mid-Atlantic cyclones locally known as Northeasters or Nor'easters. Because most Nor'easters generally occur during winter weather months, these hazards have also been grouped as a type of severe winter weather storm. Types of severe winter weather events or conditions are further defined as follows:

- **Heavy Snow:** According to the National Weather Service (NWS), heavy snow is generally considered snowfall accumulating to depth of 4 inches or more within 12 hours or less or snowfall accumulating to depth of 6 inches or more within 24 hours or less. A snow squall is an intense but limited-duration period of moderate to heavy snowfall, also known as a snowstorm, accompanied by strong, gusty surface winds and possibly lightning (generally moderate to heavy snow showers) (NWS 2009). Snowstorms are complex phenomena involving heavy snow and winds whose impact can be affected by a great many factors, including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and occurrence during the course of the day, weekday versus weekend, and time of season (Kocin and Uccellini 2013).
- **Blizzard:** Blizzards are characterized by low temperatures, wind gusts of 35 miles per hour (mph) or more and falling and/or blowing snow that reduces visibility to 0.25 mile or less for an extended period (3 or more hours) (NWS 2009). A severe blizzard is defined as having a wind velocity of 45 mph, temperatures of 10 °F or lower, and a high density of blowing snow with visibility frequently measured in feet over an extended period.
- **Sleet or Freezing Rain:** Sleet is defined as pellets of ice composed of frozen or mostly frozen raindrops or refrozen, partially melted snowflakes. These pellets of ice usually bounce after hitting the ground or other hard surfaces. Freezing rain is rain that falls as a liquid but freezes into glaze upon contact with the ground. Both types of precipitation, even in small accumulations, can cause significant hazards to a community (NWS 2009).
- **Ice Storm:** An ice storm is described as an occasion when damaging volumes of ice are expected to accumulate during freezing rain situations. Significant accumulations of ice pull down trees and utility lines, resulting in loss of power and means of communication. These accumulations of ice render walking and driving extremely dangerous and can create extreme hazards to motorists and pedestrians (NWS 2009).
- **Nor'easter:** Nor'easters are macro-scale, extra-tropical storms named for the strong northeasterly winds that blow in from the Atlantic Ocean ahead of the storm and over coastal areas of the northeastern United States and Atlantic Canada. They are also referred to as a type of extra-tropical cyclone (mid-latitude



storms, or Great Lake storms). Wind gusts associated with Nor’easters can exceed hurricane forces in intensity. Unlike tropical cyclones that form in the tropics and have warm cores (including tropical depressions, tropical storms, and hurricanes), Nor’easters contain a cold core of low barometric pressure that forms in the mid-latitudes. Their strongest winds are close to the earth’s surface and often extend several hundred miles across. Nor’easters may occur at any time of the year but are more common during fall and winter months (September through April) (New York City Office of Emergency Management [NYCOEM] n.d.).

Nor’easters can induce heavy snow, rain, and gale-force winds, that can cause structural damage, power outages, and unsafe human conditions. If a Nor’easter cyclone stays just offshore, the results are much more devastating than if the cyclone travels up the coast on an inland track. Nor’easters that stay inland are generally weaker and usually cause strong winds and rain. Those that stay offshore can bring heavy snow, blizzards, ice, and strong winds. In these storms, the warmer air is aloft. Precipitation falling from this warm air moves into the colder air at the surface, causing crippling sleet or freezing rain (McNoldy Multi-Community Environmental Storm Observatory [MESO] n.d.). While some of the most devastating effects of Nor’easters occur in coastal areas (e.g., beach erosion, coastal flooding), effects on inland areas, like Chester County, may include heavy snow, strong winds, and blizzards.

4.3.19.2 Location and Extent

Winter storms are regional events, most of which impact a large area of the entire Commonwealth. In many cases, surrounding states and even the northeast region of the United States is affected by a single winter storm incident.

The magnitude or severity of a severe winter storm depends on several factors, including a region’s climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified by meteorological measurements and by evaluating its societal impacts. National Oceanic and Atmospheric Administration’s (NOAA) National Centers for Environmental Information (NCEI) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that affect the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5. The index is based on spatial extent of the storm, amount of snowfall, and interaction of the extent and snowfall totals with population (based on the 2000 U.S. Census). NCEI has analyzed and assigned RSI values to over 500 storms since 1900 (NCEI 2011). Table 4.3.19-1 lists the five RSI ranking categories.

Table 4.3.19-1. RSI Ranking Categories

Category	Description	Regional Snowfall Index (RSI)
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Source: NCEI 2011



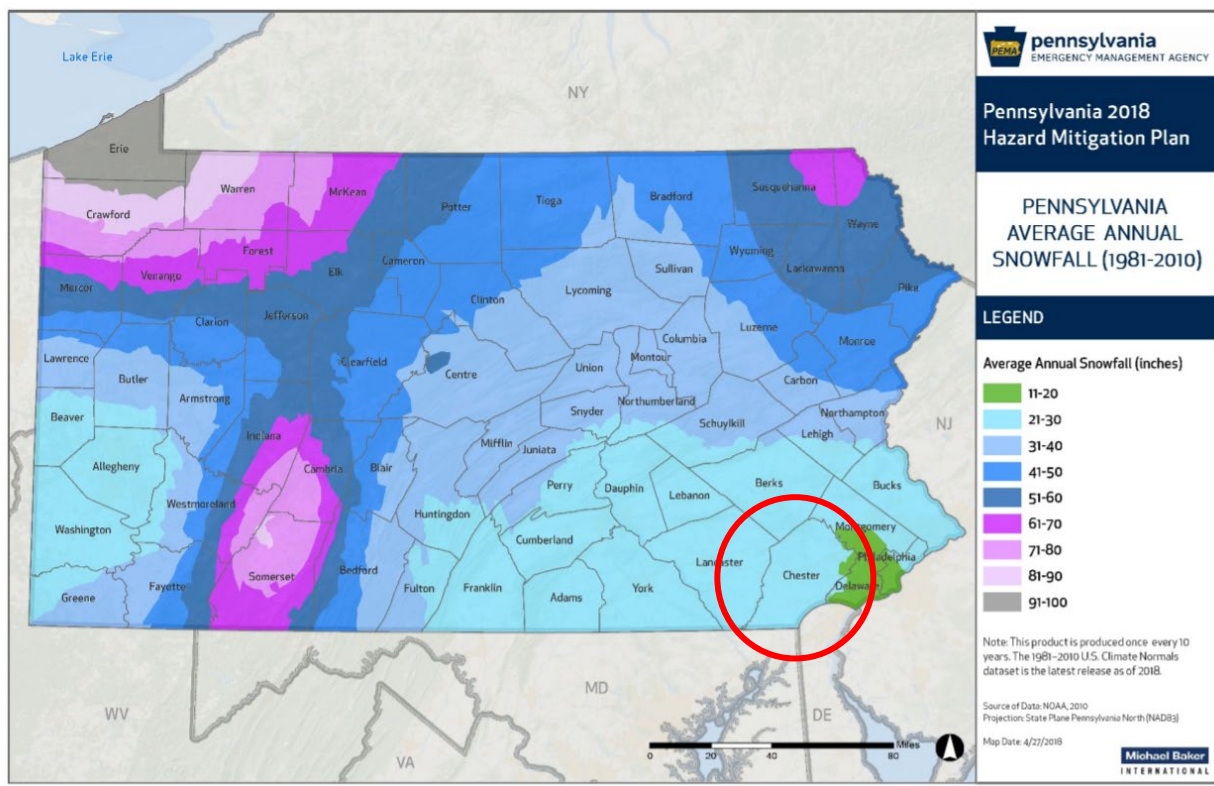
4.3.19.3 Range in Magnitude

A winter storm can adversely affect roadways, utilities, and businesses and can cause loss of life, frostbite, and freezing conditions. These storms typically fall into one of the following categories, defined in the previous section:

- Heavy snow
- Sleet or freezing rain
- Ice storm
- Blizzard
- Nor'easter

All of Chester County is susceptible to winter storms. Based on annual snowfall averages according to the 2018 State HMP, snowfall accumulation during the winter season in Chester County ranges from 30 or less inches, as shown on Figure 4.3.19-1.

Figure 4.3.19-1. Annual Snowfall



Source: Pennsylvania Emergency Management Agency (PEMA) 2018
Note: The red circle surrounds Chester County.

The March 1993 snowstorm has been referred to as the “storm of the century,” but the worst-case scenario of a winter storm in Chester County occurred in January 1996. A blizzard dropped 26 inches of snow on the county with significant drifting, causing many primary and secondary road closures. There were 154 fatalities total, 80 of which were in Pennsylvania and an estimated \$600 million to \$3 billion in property damage on the east coast (reflects 1996 dollars). The federal government was shut down for a week because of the storm and D.C. and nine states were declared disaster areas (History 2009).



4.3.19.4 Past Occurrence

Many sources provided historical information regarding previous occurrences and losses associated with winter storm events throughout the Commonwealth of Pennsylvania and Chester County. With so many sources reviewed for the purpose of this plan, loss and impact information for many events varied depending on the source. Therefore, accuracy of monetary figures discussed is based only on available information identified during research for this plan. Monetary figures may also have been calculated for the region, based on entire storm damage, and include damage from other counties.

Between 1954 and 2020, the Federal Emergency Management Agency (FEMA) declared that the Commonwealth of Pennsylvania experienced eight winter storm-related disasters (DR) or emergencies (EM) classified as one or a combination of the following disaster types: severe winter storms, snowstorms, blizzards, winter storms, severe storms, and snowfalls. Generally, these disasters covered a wide region of the Commonwealth, and therefore may have impacted many counties. However, not all counties were included in the disaster declarations. Pennsylvania Emergency Management Agency (PEMA) and other sources indicate that Chester County has been declared as a disaster area as a result of seven of the declarations for winter storm events (FEMA 2020).

According to the NOAA-NCEI storm events database, Chester County experienced 22 major winter storm events between March 1993 and March 2019. Based on all sources researched, known winter storm events that have affected Chester County are listed in Table 4.3.19-2. Because winter storm documentation for the Commonwealth of Pennsylvania is so extensive, not all sources have been identified or researched. Therefore, Table 4.3.19-2 may not include all events that have occurred throughout the county.

Table 4.3.19-2. Major Winter Storm Events in Chester County between 1993 and 2020

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
March 13-17, 1993	Severe Snowfall and Winter Storm	EM-3105	Yes	A winter storm with heavy snowfall occurred in Chester County and other counties through Pennsylvania. Nearly three feet fell within the county.
January 4-February 25, 1994	Winter Storm, Severe Storm	DR-1015	Yes	A winter storm affected several counties in Pennsylvania including Chester with freezing temperatures and more than 15 inches of snow.
January 6-12, 1996	Blizzard	DR-1085	Yes	Blizzard affected several counties in Pennsylvania including Chester. Parts of the county saw 26 inches of snow. There were 80 fatalities in the state. \$600 million - \$3 billion in damages throughout the east coast were reported.
February 14-19, 2003	Snowstorm	EM-3180	Yes	A snowstorm affected several counties in Pennsylvania including Chester. A major accident closed the eastbound lanes of the PA turnpike between Morgantown and Downingtown for 3 hours.
February 5-11, 2010	Severe Winter Storms and Snowstorms	DR-1898	Yes	Several Pennsylvania counties were affected by severe winter storms that caused major damage. 60,500 people experienced power outages in Chester County.
December 8-9, 2013	Winter Storm	N/A	N/A	5-8 inches of snow fell throughout the county causing numerous accidents and road closures.
December 14-15, 2013	Winter Storm	N/A	N/A	Snow, sleet, and freezing rain fell within the county causing difficult traveling conditions as well as isolated power outages.
January 2-3, 2014	Heavy Snow	N/A	N/A	5-8 inches of snow fell throughout Chester County.
January 21, 2014	Heavy Snow	N/A	N/A	8-9 inches of heavy snow fell in Chester County causing accidents and traffic tie-ups as well as flight cancellations.



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
February 3, 2014	Heavy Snow	N/A	N/A	8 inches of snow fell throughout the county. Schools were delayed and flights were cancelled, and some homes and businesses lost power.
February 4-20, 2014	Severe Winter Storm	EM-3367	Yes	A mix of heavy snow and ice storms happened throughout the county. In Chester County, whole municipalities lost power as did 87 percent of the county overall. There were about 400 tree blocked roadways in the county. Hardest hit municipalities included Highland, Charlestown, East Nantmeal, Parkesburg, and West Vincent. West Chester University was used as a shelter. About 265 Verizon telephone customers lost service in West Fallowfield Township. In Montgomery County, there were 340 calls for electrical fires, 1,001 road obstructions, 153 crashes, and more than 4,000 calls for police assistance. Fifty major roadways were blocked by fallen trees.
February 21, 2015	Winter Storm	N/A	N/A	Snow, sleet, and freezing rain fell across the county. No reported losses.
March 1, 2015	Winter Storm	N/A	N/A	Snowfall averaged one to four inches, but ice accumulations on exposed surfaces reached as high as around one-quarter of an inch in southeastern Pennsylvania. This caused widely scattered power outages
March 5, 2015	Heavy Snow	N/A	N/A	8-11 inches fell in the county. Pennsylvania Turnpike (Interstate 76) was closed for more than 4 hours due to a multiple tractor trailer accident in West Pikeland Township and many people lost power.
January 22-23, 2016	Severe Winter Storm and Snowstorm	DR-4267	Yes	Winds gusting over 35 mph reduced visibilities to under one-quarter mile at times. Some representative snowfall totals include 26.2 inches in East Vincent Township, 26.0 inches in Phoenixville, 26.0 inches in East Nantmeal, 25.5 inches in Caln, and 25.0 inches in East Coventry Township.
February 9-10, 2016	Heavy Snow	N/A	N/A	Some snowfall totals from eastern Chester County include 4.7 inches in West Chester, and 4.7 inches near Chadds Ford. Slippery conditions on untreated roads were problematic during the afternoon commute on the 9th, with numerous automobile accidents reported.
March 14, 2017	Winter Storm	N/A	N/A	Snowfall ranged from 5 to 8 inches across the county. Some sleet and freezing rain mixed in as well
March 6-7, 2018	Winter Storm	N/A	N/A	Over a foot of snow fell in a very short period across the eastern portions of the county. Area roadways were impassable. Some reported snowfall totals: 8.1 inches in Glenmoore, 8.0 inches in Coatesville, 6.8 inches in Exton, and 4.8 inches in Chester Springs.
March 21, 2018	Winter Storm	N/A	N/A	A mix of wet and dry snow fell throughout the county. The highest snowfall totals from the event occurred along and north of I-276. Some reported snowfall amounts include: 10.3 inches in Uwchlan Township, 10.0 inches in Elverson, and 8.6 inches in Glenmoore.
November 15, 2018	Winter Storm	N/A	N/A	An early season winter storm total snowfall ranged from 7.3 in East Nantmeal Township to 3.7 in Atglen.
February 20, 2019	Winer Storm	N/A	N/A	3.8 inches of snow and 0.15 inch of ice accumulated in the county.
March 3-4, 2019	Winter Storm	N/A	N/A	6.0 inches of snow in East Nantmeal Twp. and 5.2 inches in East Coventry Twp. were reported.



Source: NCEI 2020

Notes:

Monetary figures within this table were U.S. Dollar (USD) figures calculated during or within the approximate time of the event. If such an event would occur in the present day, many monetary losses earlier than 2017 would be considerably higher in USDs as a result of increased U.S. Inflation Rates.

DR	Federal Disaster Declaration	NCEI	National Centers for Environmental Information
FEMA	Federal Emergency Management Agency	NOAA	National Oceanic Atmospheric Administration
N/A	Not applicable/available		

4.3.19.5 Future Occurrence

Apparently, given the history of winter storm events that have impacted Chester County, future winter storm events of varying degrees will occur every year, and thus many people and properties are at risk from the winter storm hazard in the future.

Based on available historical data, future occurrences of winter storm events are considered *likely*, according to Risk Factor Methodology probability criteria further discussed in Section 4.4.

4.3.19.6 Vulnerability Assessment

To understand risk, a community must evaluate that assets that are exposed or vulnerable within the identified hazard area. Regarding winter storm events, all of Chester County has been identified as the hazard area. Therefore, all assets (population, structures, critical facilities and lifelines), as described in the Section 4.4, Hazard Vulnerability Summary, are potentially vulnerable. The following section includes an evaluation and estimation of potential winter storm impacts on the county, including:

- Data and methodology used for the evaluation
- Impacts on life, health, and safety; general building stock; critical facilities; economy; environment; and future growth and development
- Effect of climate change on vulnerability
- Further data collections that will increase understanding of this hazard over time

Impact on Life, Health, and Safety

According to the NOAA National Severe Storms Laboratory (NSSL), winter weather indirectly and deceptively kills hundreds of people in the United States every year, primarily from automobile accidents, overexertion, and exposure. Winter storms are often accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, drifting snow, extreme cold temperatures, and dangerous wind chill. Winter storms are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, of heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold.

Heavy snow can immobilize a region and paralyze a city, shutting down air and rail transportation, stopping flow of supplies, and disrupting medical and emergency services. First responders will have to take on additionally responsibilities during winter storm events such as controlling traffic, debris removal from roads, answering to a higher than normal call volume and demand, and responding to weather related traffic accidents. First responders' safety may be at risk during on scene operations and limited access to roads due to damaged infrastructure and debris may hinder their ability to respond to accidents in a timely manner. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. In the mountains, heavy snow can lead to avalanches (NSSL 2015c).

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the





extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces (NSSL 2015c).

For the purposes of this HMP, the entire population of Chester County is considered exposed to winter storm events (U.S. Census 2010). The elderly is considered most susceptible to this hazard because of their increased risk of injuries and death from falls and overexertion, and/or hypothermia from exposure while attempting to clear snow and ice. In addition, winter storm events can reduce ability of these populations to access emergency services. Residents with low incomes may not have access to housing, or their housing may be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). Section 2, County Profile, of this HMP provides population statistics regarding each participating municipality and a summary of the more vulnerable populations (over the age of 65 and individuals living below the U.S. Census poverty threshold).

Impact on General Building Stock

The entire general building stock inventory in Chester County is exposed and vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames rather than building content. Current modeling tools are not available to estimate specific losses from this hazard. As an alternate approach, this plan considers percentage damages that could result from winter storm conditions. Table 4.3.19-3 below summarizes percent damages from winter storm conditions on Chester County’s total general building stock. Given professional knowledge and currently available information, potential losses from this hazard are considered overestimated; hence, the listed values in Table 4.3.19-3 represent conservative estimates of losses associated with severe winter storm events.

Table 4.3.19-3. General Building Stock Exposure and Estimated Losses from Winter Storm Events in Chester County

Jurisdiction	Total Replacement Cost Value (RCV)	1-Percent Exposure/Loss	5-Percent Exposure/Loss	10%-Percent Exposure/Loss
Atglen (B)	\$300,171,233	\$3,001,712	\$15,008,562	\$30,017,123
Avondale (B)	\$275,491,131	\$2,754,911	\$13,774,557	\$27,549,113
Birmingham (Twp.)	\$1,521,752,088	\$15,217,521	\$76,087,604	\$152,175,209
Caln (Twp.)	\$4,389,258,174	\$43,892,582	\$219,462,909	\$438,925,817
Charlestown (Twp.)	\$2,334,124,537	\$23,341,245	\$116,706,227	\$233,412,454
Coatesville (C)	\$2,658,702,748	\$26,587,027	\$132,935,137	\$265,870,275
Downingtown (B)	\$2,678,308,815	\$26,783,088	\$133,915,441	\$267,830,881
East Bradford (Twp.)	\$3,166,888,223	\$31,668,882	\$158,344,411	\$316,688,822
East Brandywine (Twp.)	\$2,499,920,165	\$24,999,202	\$124,996,008	\$249,992,017
East Caln (Twp.)	\$1,864,909,402	\$18,649,094	\$93,245,470	\$186,490,940
East Coventry (Twp.)	\$2,200,926,728	\$22,009,267	\$110,046,336	\$220,092,673
East Fallowfield (Twp.)	\$1,984,687,476	\$19,846,875	\$99,234,374	\$198,468,748
East Goshen (Twp.)	\$5,680,635,001	\$56,806,350	\$284,031,750	\$568,063,500
East Marlborough (Twp.)	\$3,646,563,821	\$36,465,638	\$182,328,191	\$364,656,382
East Nantmeal (Twp.)	\$1,131,945,456	\$11,319,455	\$56,597,273	\$113,194,546
East Nottingham (Twp.)	\$3,185,167,607	\$31,851,676	\$159,258,380	\$318,516,761
East Pikeland (Twp.)	\$2,751,413,608	\$27,514,136	\$137,570,680	\$275,141,361
East Vincent (Twp.)	\$2,764,012,516	\$27,640,125	\$138,200,626	\$276,401,252



Section 4.3.19: Risk Assessment – Winter Storm

Jurisdiction	Total Replacement Cost Value (RCV)	1-Percent Exposure/Loss	5-Percent Exposure/Loss	10%-Percent Exposure/Loss
East Whiteland (Twp.)	\$8,143,686,632	\$81,436,866	\$407,184,332	\$814,368,663
Easttown (Twp.)	\$3,998,338,009	\$39,983,380	\$199,916,900	\$399,833,801
Elk (Twp.)	\$754,193,647	\$7,541,936	\$37,709,682	\$75,419,365
Elverson (B)	\$516,332,051	\$5,163,321	\$25,816,603	\$51,633,205
Franklin (Twp.)	\$1,537,535,450	\$15,375,354	\$76,876,772	\$153,753,545
Highland (Twp.)	\$1,067,555,265	\$10,675,553	\$53,377,763	\$106,755,526
Honey Brook (B)	\$446,825,932	\$4,468,259	\$22,341,297	\$44,682,593
Honey Brook (Twp.)	\$3,389,705,910	\$33,897,059	\$169,485,296	\$338,970,591
Kennett (Twp.)	\$4,134,894,338	\$41,348,943	\$206,744,717	\$413,489,434
Kennett Square (B)	\$1,600,982,472	\$16,009,825	\$80,049,124	\$160,098,247
London Britain (Twp.)	\$1,064,040,035	\$10,640,400	\$53,202,002	\$106,404,003
London Grove (Twp.)	\$3,148,102,405	\$31,481,024	\$157,405,120	\$314,810,241
Londonderry (Twp.)	\$1,034,199,367	\$10,341,994	\$51,709,968	\$103,419,937
Lower Oxford (Twp.)	\$2,325,017,464	\$23,250,175	\$116,250,873	\$232,501,746
Malvern (B)	\$1,256,307,741	\$12,563,077	\$62,815,387	\$125,630,774
Modena (B)	\$143,886,459	\$1,438,865	\$7,194,323	\$14,388,646
New Garden (Twp.)	\$5,996,313,471	\$59,963,135	\$299,815,674	\$599,631,347
New London (Twp.)	\$1,850,994,293	\$18,509,943	\$92,549,715	\$185,099,429
Newlin (Twp.)	\$767,919,221	\$7,679,192	\$38,395,961	\$76,791,922
North Coventry (Twp.)	\$2,814,129,243	\$28,141,292	\$140,706,462	\$281,412,924
Oxford (B)	\$1,620,222,123	\$16,202,221	\$81,011,106	\$162,022,212
Parkesburg (B)	\$791,790,495	\$7,917,905	\$39,589,525	\$79,179,050
Penn (Twp.)	\$3,335,917,017	\$33,359,170	\$166,795,851	\$333,591,702
Pennsbury (Twp.)	\$1,741,030,601	\$17,410,306	\$87,051,530	\$174,103,060
Phoenixville (B)	\$4,404,373,172	\$44,043,732	\$220,218,659	\$440,437,317
Pocopson (Twp.)	\$1,616,048,060	\$16,160,481	\$80,802,403	\$161,604,806
Sadsbury (Twp.)	\$1,514,078,865	\$15,140,789	\$75,703,943	\$151,407,886
Schuylkill (Twp.)	\$3,296,773,180	\$32,967,732	\$164,838,659	\$329,677,318
South Coatesville (B)	\$656,482,254	\$6,564,823	\$32,824,113	\$65,648,225
South Coventry (Twp.)	\$1,175,837,157	\$11,758,372	\$58,791,858	\$117,583,716
Spring City (B)	\$913,935,869	\$9,139,359	\$45,696,793	\$91,393,587
Thornbury (Twp.)	\$1,249,939,720	\$12,499,397	\$62,496,986	\$124,993,972
Tredyffrin (Twp.)	\$13,427,976,905	\$134,279,769	\$671,398,845	\$1,342,797,691
Upper Oxford (Twp.)	\$1,327,197,078	\$13,271,971	\$66,359,854	\$132,719,708
Upper Uwchlan (Twp.)	\$3,757,709,779	\$37,577,098	\$187,885,489	\$375,770,978
Uwchlan (Twp.)	\$7,025,589,763	\$70,255,898	\$351,279,488	\$702,558,976



Jurisdiction	Total Replacement Cost Value (RCV)	1-Percent Exposure/Loss	5-Percent Exposure/Loss	10%-Percent Exposure/Loss
Valley (Twp.)	\$2,597,377,442	\$25,973,774	\$129,868,872	\$259,737,744
Wallace (Twp.)	\$1,322,743,721	\$13,227,437	\$66,137,186	\$132,274,372
Warwick (Twp.)	\$1,133,542,100	\$11,335,421	\$56,677,105	\$113,354,210
West Bradford (Twp.)	\$3,995,074,181	\$39,950,742	\$199,753,709	\$399,507,418
West Brandywine (Twp.)	\$2,231,906,820	\$22,319,068	\$111,595,341	\$223,190,682
West Caln (Twp.)	\$2,765,167,902	\$27,651,679	\$138,258,395	\$276,516,790
West Chester (B)	\$5,374,643,016	\$53,746,430	\$268,732,151	\$537,464,302
West Fallowfield (Twp.)	\$1,743,066,295	\$17,430,663	\$87,153,315	\$174,306,629
West Goshen (Twp.)	\$9,444,801,871	\$94,448,019	\$472,240,094	\$944,480,187
West Grove (B)	\$499,625,186	\$4,996,252	\$24,981,259	\$49,962,519
West Marlborough (Twp.)	\$997,081,475	\$9,970,815	\$49,854,074	\$99,708,147
West Nantmeal (Twp.)	\$1,139,858,316	\$11,398,583	\$56,992,916	\$113,985,832
West Nottingham (Twp.)	\$1,196,217,005	\$11,962,170	\$59,810,850	\$119,621,701
West Pikeland (Twp.)	\$1,506,034,830	\$15,060,348	\$75,301,741	\$150,603,483
West Sadsbury (Twp.)	\$1,651,357,888	\$16,513,579	\$82,567,894	\$165,135,789
West Vincent (Twp.)	\$2,587,356,437	\$25,873,564	\$129,367,822	\$258,735,644
West Whiteland (Twp.)	\$7,660,221,171	\$76,602,212	\$383,011,059	\$766,022,117
Westtown (Twp.)	\$3,282,102,771	\$32,821,028	\$164,105,139	\$328,210,277
Willistown (Twp.)	\$4,727,817,226	\$47,278,172	\$236,390,861	\$472,781,723
Chester County (Total)	\$194,736,735,824	\$1,947,367,358	\$9,736,836,791	\$19,473,673,582

Source: Chester County GIS 2020; RSMears 2019

Notes: % - Percent; B = Borough; C = City; Twp. = Township

An area especially vulnerable to the winter storm hazard is the floodplain. At-risk building stock and infrastructure in floodplains are presented in the flood hazard profile in Section 4.3.6. Generally, losses from flooding associated with winter storms should be less than those associated with a 1-percent or 0.2-percent flood. Snow and ice melt can cause both riverine and urban flooding. Estimated losses caused by riverine flooding in the county are discussed in Section 4.3.6.

Impact on Critical Facilities

Full functionality of critical facilities such as police, fire, and emergency medical services is essential for response during and after a winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, these should undergo only minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended for critical facilities and infrastructure.

Impact on the Economy

Infrastructure at risk from the winter storm hazard includes roadways that could be damaged by application of salt and intermittent freezing and warming conditions that can damage roads over time. Costs of snow and ice removals, as well as repairs of roads undergoing freeze/thaw cycles, can drain local financial resources. Potential



secondary impacts from winter storms also impact the local economy, including loss of utilities, interruption of transportation corridors, and loss of business function.

Impact on the Environment

Environmental impacts often include damage to trees and shrubs caused by heavy snow loading, ice build-up, and/or high winds, which can break limbs and down large trees. Indirect effects of winter storms include possible damage to surfaces and contamination of groundwater adjacent to roadway surfaces treated with salt, chemicals, and other de-icing materials (PEMA 2013).

Winter storms have a positive environmental impact; gradual melting of snow and ice recharges groundwater. However, abrupt high temperatures following a heavy snowfall can accelerate snowmelt, leading to rapid surface water runoff and severe flooding (PEMA 2013).

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensure that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that can affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Areas targeted for potential future growth and development within the next 5 to 10 years have been identified across the county at the municipal level and are further discussed in Section 4.4 of this HMP. Because Chester County in its entirety has been identified as the hazard area vulnerable to the winter storm hazard, any new development will be exposed to associated risks. However, because of increased standards and codes, new development may be less vulnerable to the severe winter weather hazard compared with the aging building stock in the county.

Projected Changes in Population

As discussed in Section 2, County Profile, the Chester County population has been increasing and is projected to continue to increase in coming decades. In addition, the population is aging. As the aging population grows, so too will the number of persons vulnerable to severe winter weather and extreme cold temperatures.

Climate Change

Climate is defined not simply as average temperature and precipitation, but also by the type, frequency, and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extreme events such as winter storms. While predicting changes of winter storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA] 2006).

In terms of snowfall and ice storms in Chester County, the lack of quantitative data makes it difficult to predict the ways in which future climate change will affect this hazard. It is likely that the number of winter weather events may decrease, and the winter weather season may shorten; however, it is also possible that the intensity of winter storms may increase. An increase in the frequency and severity of severe winter storms could result in an increase of snow loads on the county's building stock and infrastructure, putting each building at risk to structural damage. More frequent and severe events also will result in increased resources spent to prepare for and clean-up after an event. However, as winter temperatures continue to rise, climate projections indicate the increase in precipitation is likely to occur during the winter months as rain. Increased rain on snowpack or frozen or saturated soils can lead to increased flooding and related impacts on the county's assets.



Vulnerability Change Since the 2015 HMP

Overall, the county’s exposure and vulnerability have not changed, and the entire county will continue to be exposed and vulnerable to severe winter storm events.

Effect of Climate Change on Vulnerability

Climate is defined not just as average temperature and precipitation, but also by type, frequency, and intensity of weather events. Both globally and at the local level, climate change potentially can alter prevalence and severity of weather extremes such as winter storms. While predicting changes in winter storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment.

The climate of Pennsylvania has changed in several ways. Over the past 100 years, annual average temperatures have been rising across the Commonwealth. Warmer winters have led to decrease in snow cover and earlier arrival of spring. Recent analyses based on the Intergovernmental Panel on Climate Change models suggest a decrease in frequency and an increase in intensity of extra-tropical winter cyclones. However, based on the methodology applied, some models show no significant change in the storm track whereas others indicate a northward displacement of the storm track in the North Atlantic. For the mid-Atlantic region, there is little indication of a change in storm activity or track over Pennsylvania. An overall increase in winter precipitation is anticipated, with decrease in snow and increase in rain during the winter months. Projections regarding future occurrences of extra-tropical cyclones in Pennsylvania are substantially uncertain. Based on available information and projections, winter storms are anticipated to continue to affect Pennsylvania in the future. Future improvements in modeling smaller-scale climatic processes can be expected and will lead to improved understanding of ways in which changing climate will alter temperature, precipitation, and storm events in Pennsylvania (Shortle and others 2009).

Additional Data and Next Steps

The assessment above identifies vulnerable populations and economic losses associated with the winter storm hazard of concern. Historical data on structural losses to general building stock are not adequate to predict specific losses to this inventory; therefore, the percent of damage assumption methodology was applied. This methodology is based on FEMA How-to Series (FEMA 386-2), Understanding Your Risks, Identifying and Estimating Losses (FEMA 2001), and FEMA’s Using HAZUS-MH for Risk Assessment (FEMA 433) (FEMA 2015a). Acquisition of additional and actual valuation data regarding general building stock and critical infrastructure losses would further support future estimates of potential exposure of and damage to the general building stock inventory.



4.4 HAZARD VULNERABILITY SUMMARY

This section describes the methodology and tools used to support the risk assessment process.

4.4.1 Methodology

A risk assessment is the process of measuring the potential loss of life, personal injury, and economic and property damage resulting from identified hazards. Identifying potential hazards and vulnerable assets allows planning personnel to address and reduce hazard impacts, and emergency management personnel to establish early response priorities. Results of the risk assessment are used in subsequent mitigation planning processes, including determining and prioritizing mitigation actions that reduce each jurisdiction's risk to a specified hazard. Past, present, and future conditions must be evaluated to assess risk most accurately for the county and each jurisdiction. The process focuses on the following elements:

- **Hazard identification** – Use all available information to determine what types of hazards may affect a jurisdiction.
- **Profile each hazard** – Understand each hazard in terms of:
 - Extent – Severity of each hazard
 - Location – Geographic area most affected by the hazard
 - Previous occurrences and losses
- **Assess Vulnerability**
 - Exposure identification – Estimate the total number of assets in the jurisdiction that are likely to experience a hazard event if it occurs by overlaying hazard maps with the asset inventories.
 - Vulnerability identification and loss estimation – Assess the impact of hazard events on the people, property, economy, and lands of the region, including estimates of the cost of potential damage or cost that can be avoided by mitigation.
 - Future changes that may impact vulnerability – Analyze how demographic changes, projected development, and climate change impacts can alter current exposure and vulnerability.

The Chester County risk assessment was updated using best available information.

1. A new custom-building inventory was developed using 2019 RS Means values.
2. 2014-2018 American Community Survey 5-year Population Estimates were utilized.
3. A critical facility list was updated and reviewed by the Planning Partnership and county jurisdictions.
4. Lifelines were identified in the critical facility inventory to align with the Federal Emergency Management Agency (FEMA) lifeline definition.
5. Hazus-MH v4.2 was used to estimate potential impacts to the flood, seismic and wind hazards.
6. Best available hazard data was used, as described in this section.

Asset Inventories

Chester County assets were identified to assess potential exposure and loss associated with the hazards of concern. For the Hazard Mitigation Plan (HMP) update, Chester County assessed exposure and vulnerability of the following types of assets: population, buildings and critical facilities/infrastructure, new development, and the environment. Some assets may be more vulnerable because of their physical characteristics or socioeconomic uses. To protect individual privacy and the security of critical facilities, information on properties assessed is presented in aggregate, without details about specific individual personal or public properties.

Population

Total population statistics from the 2014-2018 American Community Survey (ACS) 5-year estimate were used to estimate the exposure and potential impacts to the county's population in place of the 2010 U.S. Census block



estimates. Borough, city, and township populations were extracted directly from ACS. Population counts at the jurisdictional level were averaged among the residential structures in the county to estimate the population at the structure level. This estimate is a more precise distribution of population across the county compared to only using the Census block or Census tract boundaries. Limitations of these analyses are recognized, and thus the results are used to provide only a general estimate for planning purposes.

As discussed in Section 2 (County Profile), research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Chester County included in the risk assessment are children, elderly, population below the poverty level, non-English speaking individuals, and persons with a disability.

Buildings

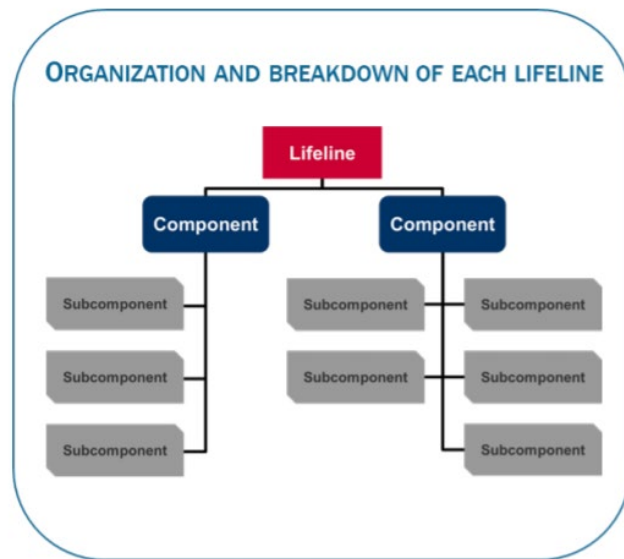
A custom general building stock was created countywide. The building inventory attributes were completed using parcel tax assessor information provided by Chester County Geographic Information System (GIS). Attributes provided in the spatial files were used to further define each structure, such as year built, number of stories, basement type (if present), occupancy class, and square footage. The centroid of each building footprint was used to estimate the building location. Structural and content replacement cost values (RCV) were calculated for each building using the available assessor data, the building footprint, and RS Means 2019 values. The analysis used the best option based on the zip codes within the county, which best fit within the location factors for West Chester, Pennsylvania. Therefore, the location factors of 1.10 and 1.09 were applied for non-residential occupancy classes and residential occupancy classes, respectively. Replacement cost value is the current cost of returning an asset to its pre-damaged condition using present-day cost of labor and materials. Total replacement cost value consists of both the structural cost to replace a building and the estimated value of contents of a building. The occupancy classes available in Hazus were condensed into the categories of residential, commercial, industrial, agricultural, religious, governmental, and educational to facilitate analysis and presentation of results. Residential loss estimates addressed both multi-family and single-family dwellings.

Critical Facilities and Lifelines

The critical facility inventory, which includes essential facilities, utilities, transportation features and user-defined facilities, as outlined in Section 4, was updated using GIS data provided by Chester GIS & Mapping Services. It was then reviewed by the Planning Committee allowing for municipal input. To protect individual privacy and the security of assets, information is presented in aggregate, without details about specific individual properties or facilities.

The identification of community lifelines across Chester County provides an enhancement to the 2021 HMP. FEMA defines a lifeline as: *“providing indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security.”*

Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential





impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occur. According to FEMA, a community may have the following lifelines:

- Safety and Security
- Food, Water and Shelter
- Health and Medical
- Energy (Power and Fuel)
- Communications
- Transportation
- Hazardous Materials

Each lifeline category is comprised of multiple components and subcomponents that help define the services that make up that lifeline. The components FEMA describes for each lifeline are summarized by Table 4.4-1.

Table 4.4-1. FEMA Lifeline Categories and Components

Lifeline Category	Lifeline Components
Safety and Security	Law Enforcement/Security
	Fire Service
	Search and Rescue
	Government Service
	Community Safety
Food, Water, and Shelter	Food
	Water
	Shelter
	Agriculture
Health and Medical	Medical Care
	Public Health
	Patient Movement
	Medical Supply Chain
	Fatality Management
Energy	Power Grid
	Fuel
Communications	Infrastructure
	Responder Communications
	Alerts, Warnings, and Messages
	Finance
	911 and Dispatch
Transportation	Highway/Roadway/Motor Vehicle
	Mass Transit
	Railway
	Aviation
	Maritime
Hazardous Materials	Facilities
	HAZMAT, Pollutants, Contaminants

Source: FEMA 2020

New Development

The county has not identified specific areas for residential development. However, residential development could be expected to take place in areas of growth. Residential redevelopment could also take place in areas that have been identified and addressed as Growth Areas by the county (Figure 4.4-1 through Figure 4.4-8).



Methodology

To address the requirements of the DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Chester County used standardized tools, combined with local, Commonwealth of Pennsylvania (Commonwealth), and federal data and expertise to conduct the risk assessment. Three levels of analysis were used depending on the data available for each hazard, as described below.

- 1) **Historic Occurrences and Qualitative Analysis**—This analysis includes an examination of historic impacts to understand potential impacts of future events of similar size. In addition, potential impacts and losses are discussed qualitatively using best available data and professional judgement.
- 2) **Exposure Assessment**—This analysis involves overlaying available spatial hazard layers, or hazards with defined extent and locations, with assets in GIS to determine which assets are located in the impact area of the hazard. The analysis highlights which assets might be affected by the hazard. If the center of each asset is located in the hazard area, it is deemed exposed and potentially vulnerable to the hazard.
- 3) **Loss estimation**—The FEMA Hazus modeling software was used to estimate potential losses for the following hazards: flood, earthquake, and hurricane. In addition, an examination of historic impacts and an exposure assessment was conducted for these spatially delineated hazards.

Table 4.4-2. Summary of Risk Assessment Analyses

Hazard	Population	General Building Stock	Critical Facilities
Dam Failure	E	E	E
Drought and Water Deficiencies	Q	Q	Q
Earthquake	H	H	H
Flood	E, H	E, H	E, H
Hazardous Material Release	E	E	E
Hurricane/Tropical Storm	H	H	H
Invasive Species	Q	Q	Q
Nuclear Incident	E	E	E
Opioid Addiction Response	Q	Q	Q
Pandemic and Infectious Disease	Q	Q	Q
Gas and Liquid Pipelines	E	E	E
Radon Exposure	Q	Q	Q
Structural Fire	Q	Q	Q
Terrorism	Q	Q	Q
Tornado Windstorm	Q	Q	Q
Transportation Accident	Q	Q	Q
Utility Interruption	Q	Q	Q
Winter Storm	Q	Q	Q

Notes: E = Exposure analysis; H = Hazus analysis; Q = Qualitative analysis

Hazards U.S. – Multi-Hazard (Hazus-MH)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or Hazus. Hazus was developed in response to the need for more effective national-, Commonwealth-, and community-level planning and for identification of areas that face the highest risk and potential for loss. Hazus was expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from wind (severe storms) and flood (riverine) hazards. Hazus is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are





accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

Hazus uses GIS technology to produce damage reports, detailed maps, and analytical reports that estimate a community’s direct physical damage to building stock, critical facilities, transportation systems, and utility systems. To generate this information, the model uses default Hazus-provided data for inventory, vulnerability, and hazards. This default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, economic impact) depending on the hazard and available local data. The Hazus open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. More information on Hazus is available at <http://www.fema.gov/hazus>.

In general, probabilistic analyses were performed to develop expected and estimated distribution of losses (mean return period losses) for the flood, seismic, and wind hazards. The probabilistic model generates estimated damage and loss for specified return periods (e.g., 100- and 500-year). For annualized losses, Hazus calculates the maximum potential annual dollar loss resulting from various return periods averaged on a per-year basis. The model sums all Hazus-supplied return periods (e.g., 10, 50, 100, 200, 500) multiplied by the return period probability (as a weighted calculation) to calculate the estimated cost of a hazard each year. Table 4.4-2 displays the various levels of analyses that can be conducted using the Hazus software.

Table 4.4-3. Summary of Hazus-MH Analysis Levels

Hazus-MH Analysis Levels	
Level 1	Hazus-MH provided hazard and inventory data with minimal outside data collection or mapping.
Level 2	Analysis involves augmenting the Hazus-MH provided hazard and inventory data with more recent or detailed data for the study region, referred to as local data.
Level 3	Analysis involves adjusting the built-in loss estimation models used for the hazard loss analyses and is typically done in conjunction with the use of local data.

Source: FEMA 2019

Dam Failure

To assess the vulnerability of Chester County to dam failure, an exposure assessment was conducted. The county’s assets (population, buildings, and critical facilities) were analyzed to determine if they were within the dam inundation areas. Dam safety organizations and regulations, including the Pennsylvania Department of Environmental Protection (PA DEP) , FEMA, U.S. Army Corps of Engineers, and Federal Energy Regulatory Commission, were examined.

Earthquake

A probabilistic assessment was conducted for Chester County for the 500-year mean return period (MRP) event through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates. The probabilistic method uses information from historic earthquakes and inferred faults, locations, and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the Hazus Earthquake User Manual, “Although the software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of



buildings and facilities of different sizes, shapes, and structural systems that have been constructed over a range of years under diverse seismic design codes. There are a variety of components that contribute to transportation and utility system damage estimations. These components can have differing seismic resistance.” However, Hazus’ potential loss estimates are acceptable for the purposes of this HMP.

Groundwater was set at a depth of 5 feet (default setting). The default assumption is a magnitude 7.0 earthquake for all return periods. Although damage is estimated at the census tract level, results were presented at the municipal level. Since multiple census tracts contain more than one jurisdiction, an area analysis was used to extract the percent of each tract that falls within individual jurisdictions. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

Damage estimates are calculated for losses to buildings (structural and non-structural) and contents; structural losses include load-carrying components of the structure, and non-structural losses include those to architectural, mechanical, and electrical components of the structure, such as nonbearing walls, veneer and finishes, HVAC systems, boilers, etc.

Environmental Hazard – Hazardous Material Release

Overall, potential losses from HazMat incidents are difficult to quantify because of the many variables and human elements. Data regarding this hazard were obtained from Chester County and the Planning Partnership as well as appropriate Commonwealth and federal resources.

The exposure analysis was conducted for the county’s assets (population, building stock, critical facilities) using a radius around potential HazMat incident sites as follows: exposure within 0.5 mile of major roadways, railways, and pipelines, as well as exposure within unique radii supplied by the county for hazardous material facilities.

To determine potential impact on the county, a 0.5-mile buffer was placed around the identified major roadways and rail lines, and the designated vulnerability radius of each of the county’s 72 SARA Title III planning facilities was used to define the hazard area. The primary roadways in Chester County are listed as follows:

- Interstate 76
- U.S. Route 30
- U.S. Route 322
- U.S. Route 3
- U.S. Route 1
- Pennsylvania Route 3
- Pennsylvania Route 10
- Pennsylvania Route 23
- Pennsylvania Route 29
- Pennsylvania Route 100
- Pennsylvania Route 272

Populations and features of the built environment within these areas might be directly or indirectly affected by a potential environmental hazard. The exposure analysis was conducted for the county’s assets (population, building stock, and critical facilities) using the above buffers.

The vulnerability radius for each hazard facility is determined by the Department of Emergency Services.

Environmental Hazard – Oil and Natural Gas Pipelines

There are nearly 600 miles of gas and liquid pipelines in Chester County. The Pipeline and Hazardous Materials Safety Administration and Chester County Planning Commission’s Pipeline Information Center were referenced to assess the potential impacts to the county’s assets from a pipeline release. In addition, an exposure analysis was conducted to determine population, building stock, and critical facilities within 0.5 mile of these pipelines.



Flood, Flash Flood, Ice Jam

The 1- and 0.2-percent annual chance flood events were examined to evaluate the county's risk from the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as NFIP.

The following data was used to evaluate exposure and determine potential future losses for this plan update:

- The effective Chester County FEMA Digital Flood Insurance Rate Maps (DFIRMs) dated August 2017.
- The 1-percent annual chance flood depth grid generated using the 2017 FEMA DFIRM and the Pennsylvania Department of Conservation and Natural Resources (PA DCNR) PAMAP 3-meter Digital Elevation Model (DEM).

The effective Chester County FEMA DFIRM published in 2017 was used to evaluate exposure and determine potential future losses. The depth grid was integrated into the Hazus riverine flood model to estimate potential losses for the 1 percent annual chance flood event.

To estimate exposure to the 1 percent- and 0.2 percent annual chance flood events, the DFIRM flood boundaries were overlaid on the centroids of updated assets (population, building stock, critical facilities, and new development). Centroids that intersected the flood boundaries were totaled to estimate the building replacement cost value and population vulnerable to the flood inundation areas. A Level 2 Hazus riverine flood analysis was performed. Both the critical facility and building inventories were formatted to be compatible with Hazus and its Comprehensive Data Management System (CDMS). Once updated with the inventories, the Hazus riverine flood model was run to estimate potential losses in Chester County for the 1 percent annual chance flood events. A user-defined analysis was also performed for the building stock. Buildings located within the floodplain were imported as user-defined facilities to estimate potential losses to the building stock at the structural level. Hazus calculated the estimated potential losses to the population (default 2010 U.S. Census data across dasymetric blocks), potential damage to the general building stock, and potential damage to critical facility inventories based on the depth grids generated and the default Hazus damage functions in the flood model.

Hurricane

A Hazus probabilistic analysis was performed to analyze the wind hazard losses for Chester County for the 100- and 500-year MRP events. The probabilistic Hazus hurricane model activates a database of thousands of potential storms with tracks and intensities reflecting the full spectrum of Atlantic hurricanes observed since 1886 and identifies those with tracks associated with Chester County. Hazus contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Default demographic and updated Hazus building and critical facility inventories were used for the analysis. Although damage is estimated at the census tract level, results were presented at the municipal level. Since multiple census tracts contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

Nuclear Incident

Chester County is within 10 miles of two power plants, Peach Bottom Atomic Power Station and Limerick Generating Station, and within 50 miles of Salem-Hope Creek Nuclear Power Plant. An exposure analysis within the 10-mile radius of Peach Bottom and Limerick was conducted for the county's assets (population, building stock, and critical facilities). An agricultural exposure analysis was conducted within the 50-mile radius of Salem-Hope Creek Nuclear Power Plant.



Winter Storm

All of Chester County is exposed and vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. A percentage of the custom-building stock structural replacement cost value was utilized to estimate damage that could result from winter storm conditions (i.e., 1 percent, 5 percent, and 10 percent of total replacement cost value). Given professional knowledge and currently available information, the potential losses for this hazard are considered to be overestimated; hence, providing a conservative estimate for losses associated with winter storm events.

Qualitative Analyses

For many of the hazards evaluated in this risk assessment, historical data are not adequate to model future losses at this time. Where GIS data are not available, a qualitative analysis was conducted for the following hazards using the best available data and professional judgment. Multiple federal, Commonwealth, and academic sources were used to evaluate these hazards:

- Drought and Water Supply Deficiencies
- Extreme Temperature
- Invasive Species
- Opioid Addiction Response
- Pandemic
- Radon Exposure
- Structural Fire
- Terrorism
- Tornado and Windstorm
- Transportation Accident
- Utility Interruption

Limitations

For this risk assessment, the loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- 1) Approximations and simplifications necessary to conduct such a study
- 2) Incomplete or dated inventory, demographic, or economic parameter data
- 3) The unique nature, geographic extent, and severity of each hazard
- 4) Mitigation measures already employed by the participating municipalities
- 5) The amount of advance notice residents have to prepare for a specific hazard event

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term, Chester County will collect additional data to collect additional data and update and refine existing inventories to assist in estimating potential losses.

Potential economic loss is based on the present value of the general building stock utilizing best available data. The county acknowledges significant impacts could occur to critical facilities and infrastructure as a result of these hazard events, causing great economic loss. However, monetized damage estimates to critical facilities and infrastructure and economic impacts were not quantified and require more detailed loss analyses. In addition, economic impacts to industries, such as tourism and the real-estate market, were not analyzed.



4.4.2 Ranking Results

As discussed in Section 4.2, Hazard Identification, a comprehensive range of natural and non-natural hazards that pose significant risk to Chester County were selected and considered in this plan. However, the communities in Chester County have differing levels of exposure and vulnerability to each of these hazards. It is important for each community participating in this plan to recognize those hazards that pose the greatest risk to their community and direct their attention and resources accordingly to manage risk effectively and efficiently.

To this end, a relative hazard risk ranking process was conducted for the county using the Risk Factor (RF) methodology identified in Section 5 and Appendix 9 of Pennsylvania Emergency Management Agency’s (PEMA) All-Hazard Planning Standard Operating Guide (PEMA 2020). The guidance states:

The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: *probability, impact, spatial extent, warning time, and duration.*

To calculate the RF value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the example equation below:

Risk Factor Methodology Equation

$$\text{RF Value} = [(Probability \times .30) + (Impact \times .30) + (Spatial \text{ Extent} \times .20) + (Warning \text{ Time} \times .10) + (Duration \times .10)]$$

Hazards identified as high-risk have RFs greater than or equal to 2.5. RFs ranging from 2.0 to 2.4 are considered moderate-risk hazards. Hazards with RFs less than 2.0 are considered low risk.

Table 4.4-4 identifies the five risk assessment categories, the criteria and associated risk level indices used to quantify their risk, and the suggested weighting factor (weight value) applied to each risk assessment category. Table 4.4-5 shows the values for the five risk assessment categories for each of Chester County’s hazards and each hazard’s RF.



Table 4.4-4. Summary of Risk Factor (RF) Approach

Summary of Risk Factor (RF) Methodology				
Risk Assessment Category	Degree of Risk		Index	Weight Value
	Level	Criteria		
PROBABILITY <i>What is the likelihood of a hazard event occurring in a given year?</i>	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1% & 49.9% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 50% & 90% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	GREATER THAN 90% ANNUAL PROBABILITY	4	
IMPACT <i>In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?</i>	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT <i>How large of an area could be impacted by a hazard event? Are impacts localized or regional?</i>	NEGLECTIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10.9% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 11 & 25% OF AREA AFFECTED	3	
	LARGE	GREATER THAN 25% OF AREA AFFECTED	4	
WARNING TIME <i>Is there usually some lead time associated with the hazard event? Have warning measures been implemented?</i>	MORE THAN 24 HRS	SELF-DEFINED	1	10%
	12 TO 24 HRS	SELF-DEFINED	2	
	6 TO 12 HRS	SELF-DEFINED	3	
	LESS THAN 6 HRS	SELF-DEFINED	4	
DURATION <i>How long does the hazard event usually last?</i>	LESS THAN 6 HRS	SELF-DEFINED	1	10%
	LESS THAN 24 HRS	SELF-DEFINED	2	
	LESS THAN 1 WEEK	SELF-DEFINED	3	
	MORE THAN 1 WEEK	SELF-DEFINED	4	

Source: PEMA 2020





Table 4.4-5. Risk Ranking for Chester County

HAZARD RISK	HAZARDS	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Utility Interruption	4	3	4	4	2	3.5
	Flood, Flash Flood, and Ice Jams	4	4	1	3	3	3.2
	Opioid Addiction Response	4	4	1	4	1	3.1
	Pandemic	2	4	4	1	4	3.1
	Tornadoes and Windstorms	3	3	4	4	1	3.1
	Environmental Hazards – Hazardous Materials Releases	4	3	1	4	2	2.9
	Invasive Species	4	1	4	1	4	2.8
	Terrorism	4	3	1	4	1	2.8
	Winter Storms	3	2	4	1	3	2.7
	Environmental Hazards - Gas and Liquid Pipeline Incidents	4	2	1	4	2	2.6
	Drought and Water Supply Deficiencies	3	1	4	1	4	2.5
MODERATE	Transportation Accidents	4	1	2	4	1	2.4
	Radon Exposure	3	1	3	1	4	2.3
	Earthquake	2	1	4	4	1	2.2
	Extreme Temperatures	2	1	4	1	3	2.2
	Structural Fires	4	1	1	4	1	2.2
	Hurricane and Tropical Storms	2	1	4	1	3	2.1
LOW	Nuclear Incidents	1	2	2	4	2	1.9
	Dam Failure	1	1	1	3	2	1.3

Based on these results, there are 11 high-risk hazards, 6 moderate-risk hazards, and 2 low-risk hazards in Chester County. Mitigation actions were developed for all high-risk, moderate-risk, and low-risk hazards (see Section 6.4). The threat posed to life and property for moderate-risk and high-risk hazards is considered significant enough to warrant the need for establishing hazard-specific mitigation actions. Mitigation actions related to future public outreach and emergency service activities are identified to address low-risk hazard incidents.

A risk assessment result for the entire county does not mean that each municipality is at the same amount of risk from each hazard. Table 4.4-6 shows the different municipalities in Chester County and the perception of whether their risk is greater than (>), less than (<), or equal to (=) the RF assigned to the county as a whole, based on feedback from county and municipal officials. Municipal officials’ responses were then reviewed and updated (as appropriate) by the Planning Team.



Table 4.4-6. Jurisdictional Risk by Municipality

Municipality	Dam Failures	Drought	Earthquake	Env Hazard Hazardous Materials Release	Env Hazard Gas and Liquid Pipelines	Extreme Temperature	Flooding/Flash Flood/Ice Jam	Hurricane Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic and Infectious Disease	Radon Exposure	Structural Fire	Terrorism	Tornado/Windstorm	Transportation Accidents	Utility Interruption	Winter Storm
	1.3	2.5	2.2	2.9	2.6	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.3	2.2	2.8	3.1	2.4	3.5	2.7
Atglen Borough	<	<	=	>	>	>	>	=	=	<	=	=	=	=	=	>	>	=	=
Avondale Borough	<	<	=	>	<	>	>	=	=	<	=	=	=	=	=	=	=	=	=
Birmingham Township	>	<	=	=	<	=	>	>	=	<	=	=	=	=	=	=	>	=	=
Caln Township	>	<	=	>	>	=	>	=	=	<	=	=	=	=	=	=	>	=	=
Charlestown Township	<	<	=	=	>	=	<	>	=	>	=	=	=	=	=	=	>	=	=
Coatesville City	>	<	=	>	<	>	>	=	=	<	=	=	=	=	=	>	>	=	=
Downingtown Borough	>	<	=	>	<	>	>	=	=	<	=	=	=	=	=	=	>	=	=
East Bradford Township	>	<	=	=	<	=	>	>	=	<	=	=	=	=	=	=	=	=	=
East Brandywine Township	>	<	=	<	>	=	<	=	=	<	=	=	=	=	=	=	>	=	=
East Caln Township	>	<	=	=	>	>	<	=	=	<	=	=	=	=	=	=	>	=	=
East Coventry Township	>	>	=	<	<	=	>	=	=	>	=	=	=	=	=	=	=	=	=
East Fallowfield Township	<	>	=	<	<	=	<	=	=	<	=	=	=	=	=	=	=	=	=
East Goshen Township	=	<	=	<	>	=	>	>	=	<	=	=	=	=	=	=	=	=	=
East Marlborough Township	<	>	=	=	<	=	<	>	=	<	=	=	=	=	=	=	=	=	=
East Nantmeal Township	<	<	=	<	<	=	>	=	=	>	=	=	=	=	=	>	>	=	=
East Nottingham Township	<	>	=	<	<	>	<	=	=	<	=	=	=	=	=	>	=	=	=
East Pikeland Township	>	<	=	<	>	=	>	=	=	>	=	=	=	=	=	=	=	=	=
East Vincent Township	<	>	=	<	>	=	>	=	=	>	=	=	=	=	=	=	=	=	=
East Whiteland Township	<	<	=	>	>	=	<	=	=	>	=	=	=	=	=	=	>	=	=
Easttown Township	<	<	=	>	<	=	<	>	=	<	=	=	=	=	=	=	=	=	<



Section 4.4: Hazard Vulnerability Summary

Municipality	Dam Failures	Drought	Earthquake	Env Hazard Hazardous Materials Release	Env Hazard Gas and Liquid Pipelines	Extreme Temperature	Flooding/Flash Flood/Ice Jam	Hurricane Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic and Infectious Disease	Radon Exposure	Structural Fire	Terrorism	Tornado/Windstorm	Transportation Accidents	Utility Interruption	Winter Storm	
	1.3	2.5	2.2	2.9	2.6	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.3	2.2	2.8	3.1	2.4	3.5	2.7	
Elk Township	<	>	=	<	=	=	<	=	=	<	=	=	=	=	=	=	=	=	=	=
Elverson Borough	<	<	=	>	>	=	<	=	=	<	=	=	=	=	=	>	>	=	=	=
Franklin Township	<	>	=	<	>	=	=	>	=	<	=	=	=	=	=	=	=	=	=	=
Highland Township	<	>	=	<	<	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Honey Brook Borough	<	<	=	>	<	>	<	=	=	<	=	=	=	=	=	>	>	=	=	=
Honey Brook Township	<	>	=	<	>	>	>	=	=	<	=	=	=	=	=	=	>	=	=	=
Kennett Township	<	<	=	=	<	=	=	>	=	<	=	=	=	=	=	=	>	=	=	=
Kennett Square Borough	<	<	=	>	<	>	<	>	=	<	=	=	=	=	=	=	>	=	=	=
London Britain Township	<	<	=	<	<	=	>	>	=	<	=	=	=	=	=	=	=	=	=	=
London Grove Township	=	>	>	<	<	<	<	>	<	>	<	<	<	>	>	>	>	=	=	=
Londonderry Township	<	>	=	<	>	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Lower Oxford Township	<	>	=	<	<	>	>	=	=	<	=	=	=	=	=	>	=	=	=	=
Malvern Borough	<	<	=	>	<	=	<	>	=	<	=	=	=	=	=	=	>	=	=	=
Modena Borough	>	<	=	>	<	=	>	=	=	<	=	=	=	=	=	=	=	=	=	=
New Garden Township	<	<	=	<	=	=	<	>	=	<	=	=	=	=	=	=	=	=	=	=
New London Township	<	>	=	<	<	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=
Newlin Township	>	>	=	<	<	=	>	=	=	<	=	=	=	=	=	=	>	=	=	=
North Coventry Township	>	<	=	<	=	=	>	=	=	>	=	=	=	=	=	=	>	=	=	=
Oxford Borough	<	<	=	>	<	>	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Parkesburg Borough	<	<	=	>	<	>	<	=	=	<	=	=	=	=	=	>	>	=	=	=
Penn Township	<	>	=	=	<	>	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Pennsbury Township	>	<	=	>	<	=	>	>	=	<	=	=	=	=	=	=	>	=	=	=



Section 4.4: Hazard Vulnerability Summary

Municipality	Dam Failures	Drought	Earthquake	Env Hazard Hazardous Materials Release	Env Hazard Gas and Liquid Pipelines	Extreme Temperature	Flooding/Flash Flood/Ice Jam	Hurricane Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic and Infectious Disease	Radon Exposure	Structural Fire	Terrorism	Tornado/Windstorm	Transportation Accidents	Utility Interruption	Winter Storm	
	1.3	2.5	2.2	2.9	2.6	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.3	2.2	2.8	3.1	2.4	3.5	2.7	
Phoenixville Borough	>	<	=	>	<	=	>	>	=	>	=	=	=	=	=	=	=	=	=	=
Pocopson Township	>	>	=	>	<	=	>	>	=	<	=	=	=	=	=	=	>	=	=	=
Sadsbury Township	<	>	=	>	>	=	>	=	=	<	=	=	=	=	=	>	=	=	=	=
Schuylkill Township	=	<	=	=	>	=	>	>	=	>	=	=	=	=	=	=	=	=	=	=
South Coatesville Borough	>	<	=	=	<	=	<	=	=	<	=	=	=	=	=	>	>	=	=	=
South Coventry Township	<	<	=	<	<	>	<	=	=	>	=	=	=	=	=	>	>	=	=	=
Spring City Borough	>	<	=	=	<	=	>	>	=	>	=	=	=	=	=	=	=	=	=	=
Thornbury Township	<	<	=	=	<	=	>	>	=	<	=	=	=	=	=	=	=	=	=	=
Tredyffrin Township	<	<	=	>	<	=	<	>	=	<	=	=	=	=	=	=	>	=	=	<
Upper Oxford Township	<	>	=	<	<	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Upper Uwchlan Township	<	<	=	<	>	=	>	=	=	<	=	=	=	=	=	=	>	=	=	=
Uwchlan Township	<	<	=	<	>	=	<	=	=	<	=	=	=	=	=	=	>	=	=	=
Valley Township	>	<	=	>	>	>	<	=	=	<	=	=	=	=	=	>	>	=	=	=
Wallace Township	>	<	=	<	>	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
Warwick Township	<	<	=	<	<	=	>	=	=	>	=	=	=	=	=	>	=	=	=	=
West Bradford Township	<	<	=	<	>	=	<	=	=	<	=	=	=	=	=	=	=	=	=	=
West Brandywine Township	<	<	=	<	>	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
West Caln Township	<	<	=	<	<	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
West Chester Borough	<	<	=	>	<	>	<	=	=	<	=	=	=	=	=	=	>	=	=	=
West Fallowfield Township	<	>	=	<	<	=	<	=	=	<	=	=	=	=	=	>	=	=	=	=
West Goshen Township	<	<	=	>	>	=	=	=	=	<	=	=	=	=	=	=	>	=	=	=



Section 4.4: Hazard Vulnerability Summary

Municipality	Dam Failures	Drought	Earthquake	Env Hazard Hazardous Materials Release	Env Hazard Gas and Liquid Pipelines	Extreme Temperature	Flooding/Flash Flood/Ice Jam	Hurricane Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic and Infectious Disease	Radon Exposure	Structural Fire	Terrorism	Tornado/Windstorm	Transportation Accidents	Utility Interruption	Winter Storm	
	1.3	2.5	2.2	2.9	2.6	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.3	2.2	2.8	3.1	2.4	3.5	2.7	
West Grove Borough	<	<	=	>	<	=	<	=	=	<	=	=	=	=	=	=	=	=	=	=
West Marlborough Township	<	>	=	<	<	=	>	=	=	<	=	=	=	=	=	=	=	=	=	=
West Nantmeal Township	<	>	=	<	>	=	>	=	=	<	=	=	=	=	=	=	=	=	=	=
West Nottingham Township	<	>	=	<	<	>	>	=	=	<	=	=	=	=	=	>	=	=	=	=
West Pikeland Township	<	<	=	=	>	=	>	>	=	>	=	=	=	=	=	=	=	>	=	=
West Sadsbury Township	<	>	=	=	>	>	>	=	=	>	=	=	=	=	=	>	=	=	=	=
West Vincent Township	<	>	=	<	>	=	<	=	=	>	=	=	=	=	=	=	=	=	=	=
West Whiteland Township	<	<	=	=	>	=	>	=	=	>	=	=	=	=	=	=	>	=	=	=
Westtown Township	>	<	=	<	>	=	<	>	=	<	=	=	=	=	=	=	=	=	=	=
Willistown Township	<	<	=	=	>	=	>	>	=	>	=	=	=	=	=	=	=	=	=	<



4.4.3 Potential Loss Estimates

Potential loss estimates for hazard events help a community understand the monetary value of what might be at stake during a hazard event. Estimates are considered *potential* in that they generally represent losses that could occur in a countywide hazard scenario. Localized events could yield lower losses, while regional events could yield higher losses.

The data utilized to conduct the vulnerability assessment came from a variety of sources, as noted throughout each hazard profile and Appendix A. As summarized in the Methodology subsection the 2018 U.S. Census demographic data, Hazus-MH v4.2 default building inventory and its associated replacement cost value of the structures and contents, and the comprehensive critical facility inventory update in Hazus-MH v4.2 were used for Chester County.

Potential loss estimates provided in Section 4.3 (Hazard Profiles) were either based on historical losses, current-condition losses, and/or predictive losses by performing spatial analyses in GIS and hazard probabilistic modeling. In summary, Hazus-MH v4.2 was used to estimate potential losses for the earthquake, flood, and hurricane (tropical storm), and tornado (windstorm). For many of the hazards evaluated, historical data are not adequate to model future losses at this time. For these hazards of concern, areas and inventory susceptible to specific hazards were mapped, and exposure was evaluated to help guide mitigation efforts (mitigation efforts are discussed further in Section 6). Spatial analyses were conducted to assess potential exposure for hazards of concern with delineated hazard areas: environmental hazard hazardous materials release; environmental hazard gas and liquid pipelines; flood, flash flood, and ice jam; dam failure; and nuclear incident. Where GIS data are were available for some hazards, a qualitative analysis was conducted using the best available data and professional judgment.

4.4.4 Future Development and Vulnerability

Risk and vulnerability to natural and human-caused hazard events are not static. Risk will increase or decrease as counties and municipalities see changes in land use and development, as well as changes in population. Population change (in terms of total and demographics) and the age of the housing stock continue to be the main indicators of vulnerability change in Chester County.

Chester County experienced a 19.3 percent increase in population from 2000 to 2018, as summarized in Section 2 of this HMP. According to the U.S. Census for Population Projections, the population in Chester County is projected to increase over the coming decades. The range of projected change in population varies from a 10.2 percent population decrease in West Marlborough Township to a 96.0 increase in population in Brush Creek Township (U.S. Census 2018).

Continued analysis of the age structure in Chester County will provide deeper understanding of future vulnerability to at-risk populations. Approximately 15 percent of Chester County's population is age 65 or older (ACS 2018). As these residents continue to age in the county, they might have increased access and functional needs. For example, many residents in this age bracket might be unable to drive; therefore, development of special evacuation plans will be necessary. They might also have hearing or vision impairments that could hinder their reception of emergency instructions. Both older and younger populations are at higher risks for contracting certain diseases. Chester County's combined under-5-years-of-age and over-65 populations constitute approximately 20.6 percent of its population (ACS 2018).

Approximately 2.7 percent of Chester County's population lives in group quarters, which are communal settings that can include inmates in a prison, students in a dorm, or elderly or mentally disabled in group-care homes.



Many residents living in group quarters have special needs. It is important to ensure that each group-quarter facility has an emergency plan to account for the unique needs of its residents during a hazard event.

About 1 percent of Chester County's population is not proficient in English. Future hazard mitigation strategies should consider addressing language barriers to ensure that all residents can receive emergency instructions.

In addition, remote and sparsely populated municipalities face higher vulnerability to hazards because they do not have easy access to care facilities or response personnel. For instance, sparsely populated municipalities such as West Marlborough Township face increased vulnerability to tornadoes, windstorms, and winter storms due to isolation, access issues, and longer emergency response times.

The aging housing stock in Chester County is another source of current and future vulnerability in many hazard events. As discussed throughout Section 4, Risk Assessment, Chester County can experience strong gusts of wind during windstorms, tornadoes, hurricanes, tropical storms, or Nor'easters. The structure of these older houses can cause them to be at greater risk of destruction under these strong wind conditions. These structures might also be at risk during flooding and winter storm events if the materials are not strong enough to withstand the pressure or weight of the precipitation or are liable to leak, causing further risk of destruction to the house.

While any development increases the risk of damage and loss to natural hazards, a number of factors indicate that this increase in risk is low and mitigated by existing federal, Commonwealth, county, and local regulations, policies, and programs. All municipalities in Chester County have adopted subdivision regulations and local zoning regulations. The Chester County Planning Commission is responsible for maintaining and updating the county comprehensive plan. An elected body of comprised of supervisors or councils governs each of the 73 municipalities. Each municipality is responsible for establishing and administering municipal financial budgets and tax rates, as well as being responsible for land use controls through zoning and subdivisions regulations and building permits.

Chester County and its municipalities identified areas of potential new urban growth. As urban growth is planned, it should be compared with identified hazard areas to determine hazard vulnerability. Figure 4.4-1 through Figure 4.4-8 show the Chester County growth areas. The figures show growth areas in flood, hazmat, and nuclear incident hazard areas within Chester County.



Figure 4.4-1. Rural Growth Centers in Flood Hazard Areas

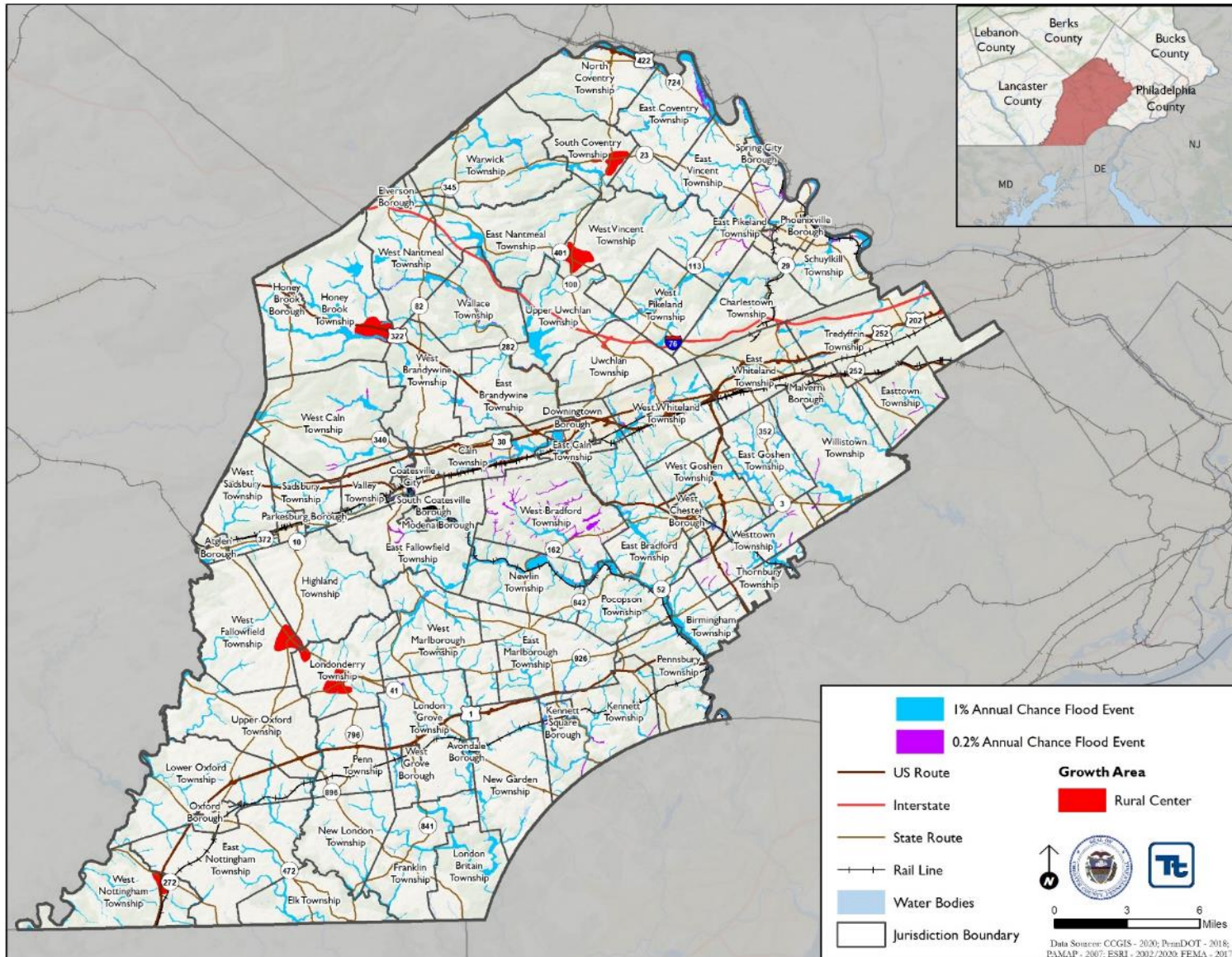




Figure 4.4-2. Suburban Growth in Flood Hazard Areas

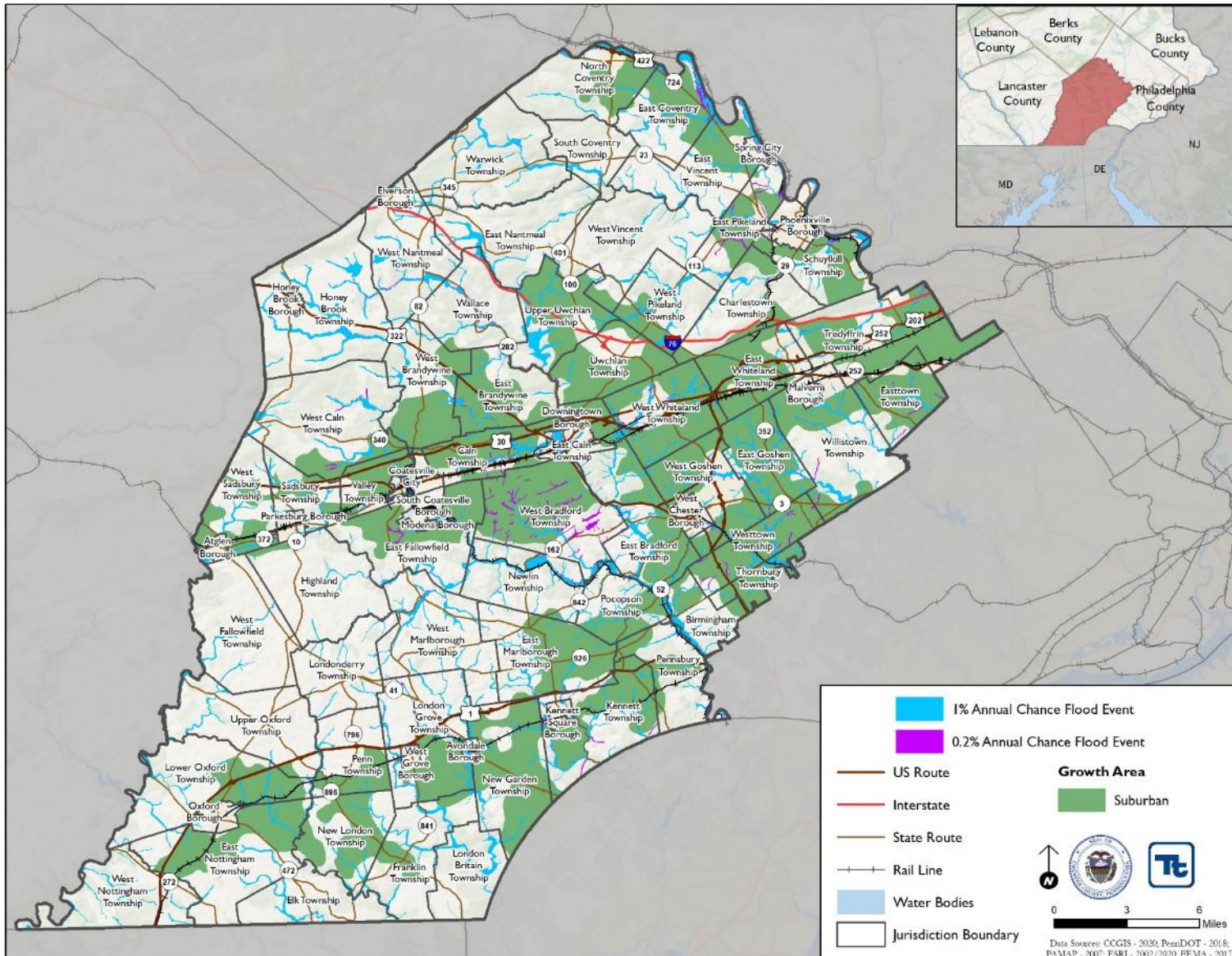




Figure 4.4-4. Urban Growth Centers in Flood Hazard Areas

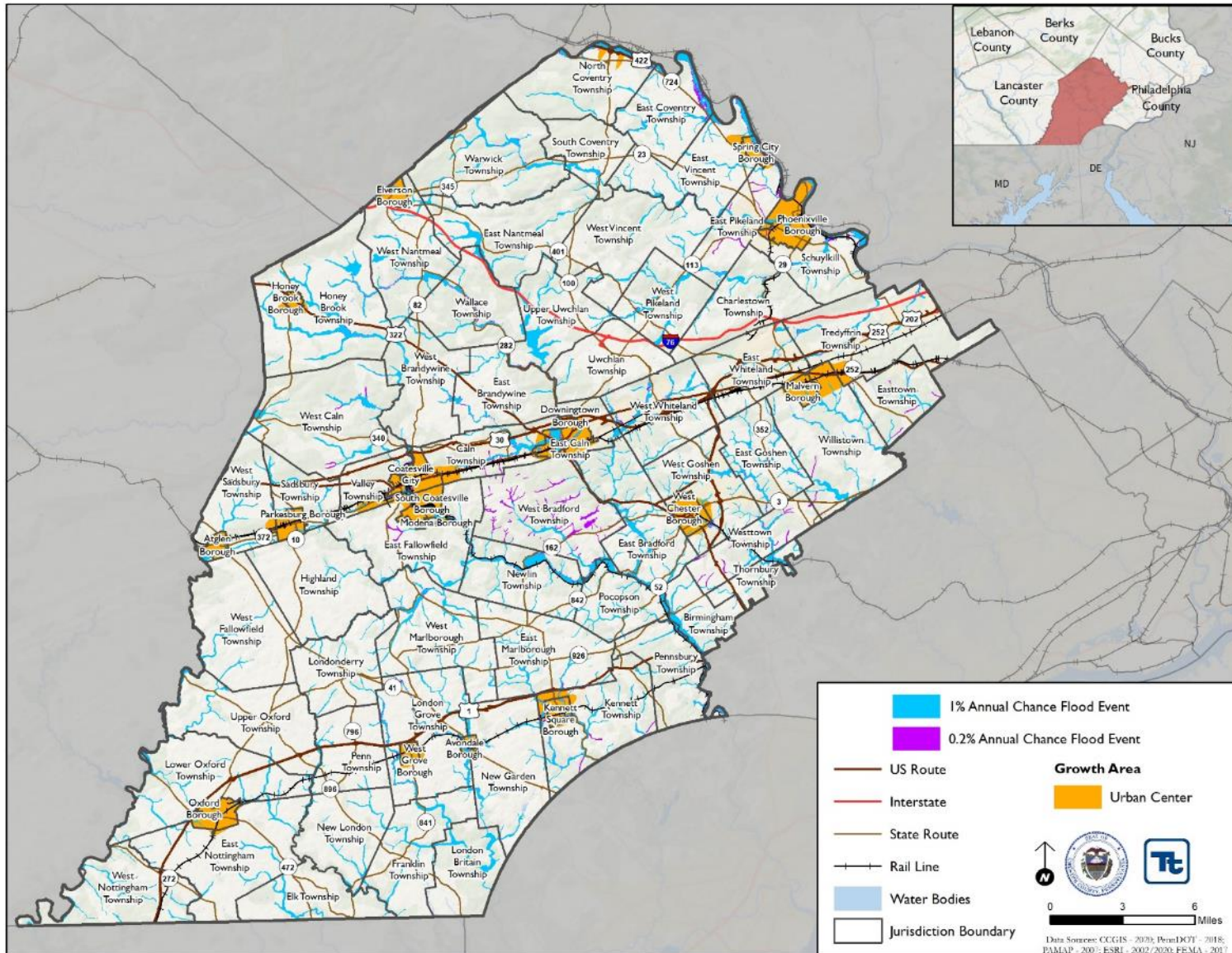




Figure 4.4-5. Rural Growth Centers in Hazmat and Nuclear Hazard Areas

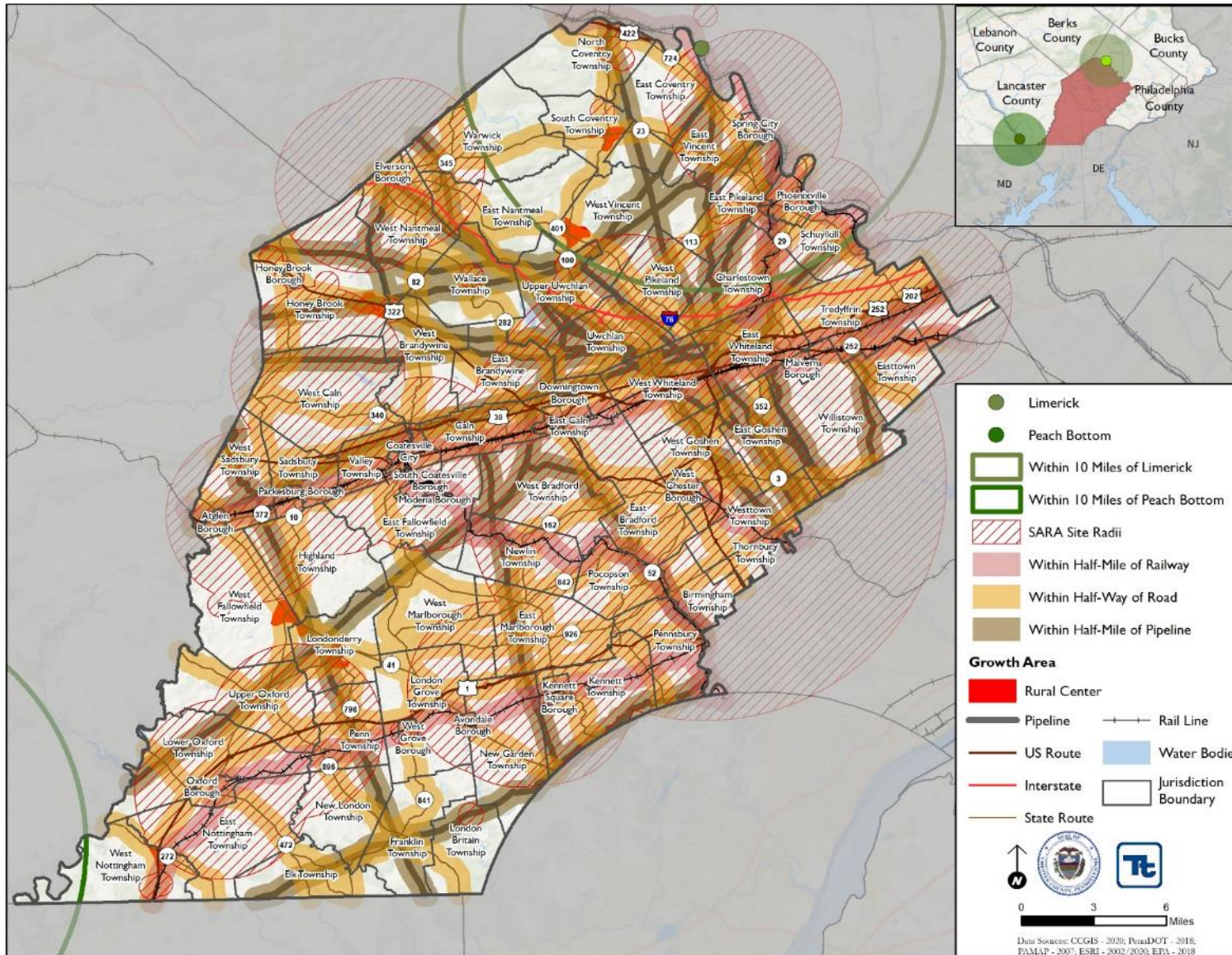




Figure 4.4-6. Suburban Growth in Hazmat and Nuclear Hazard Areas

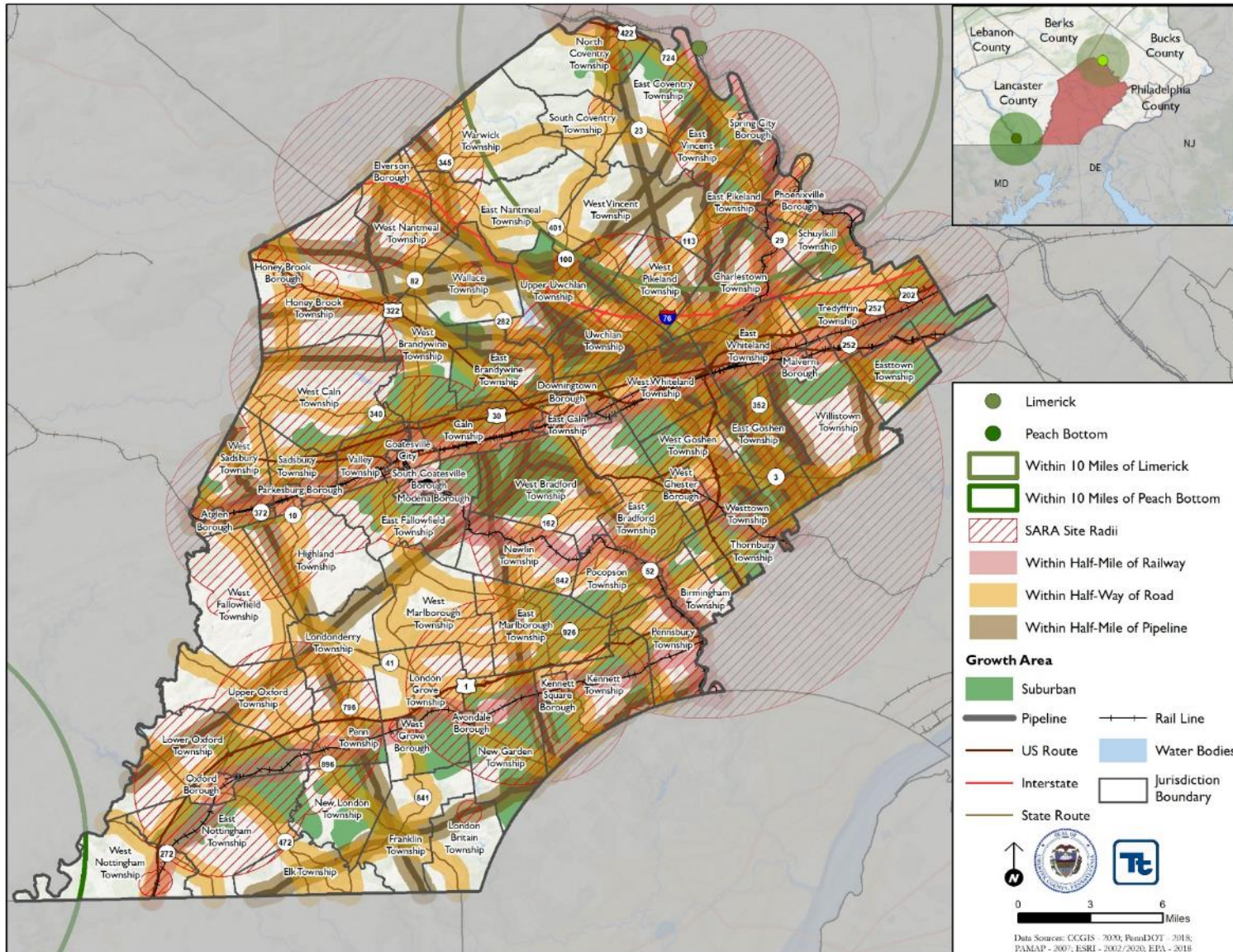




Figure 4.4-7. Suburban Growth Centers in Hazmat and Nuclear Hazard Areas

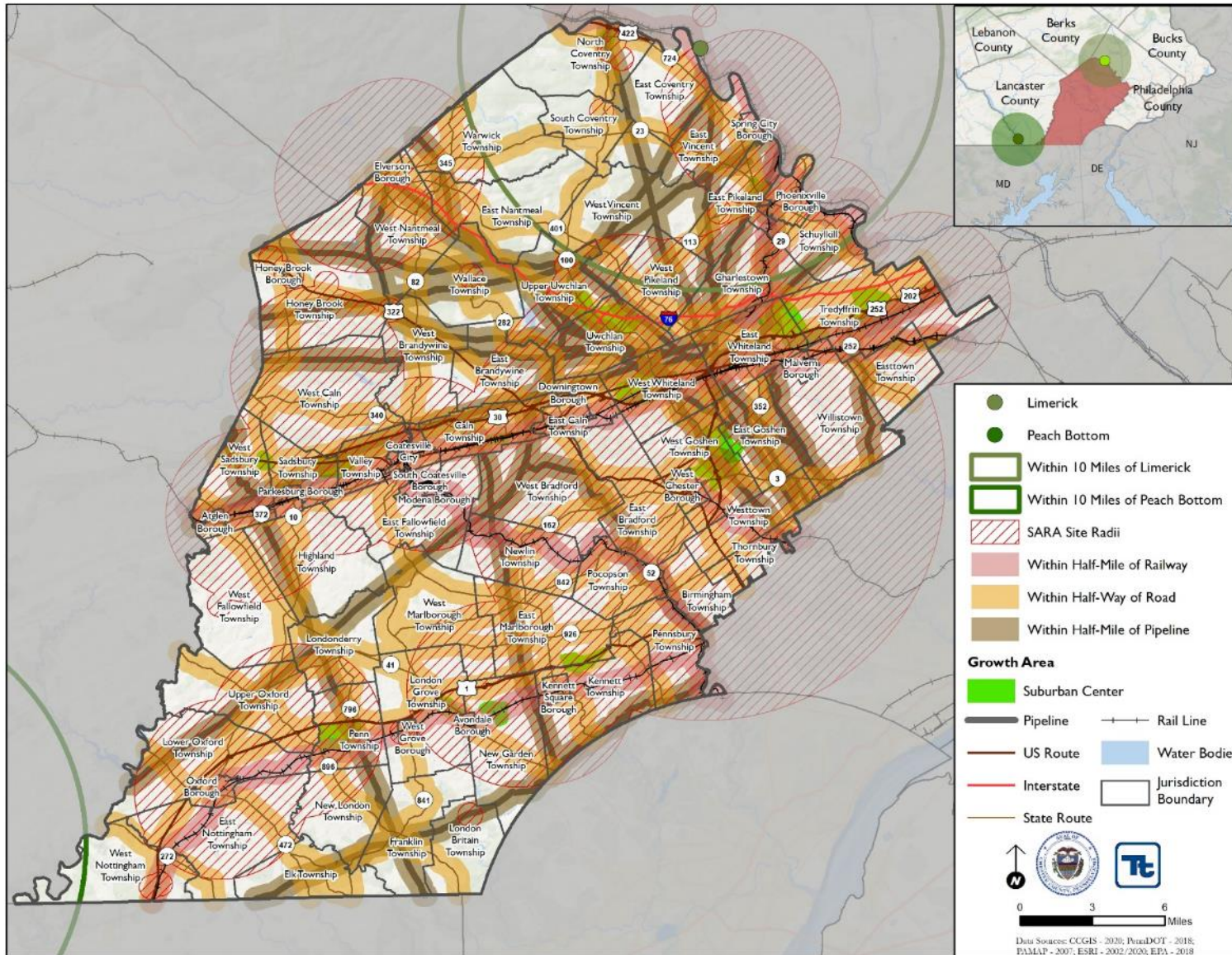
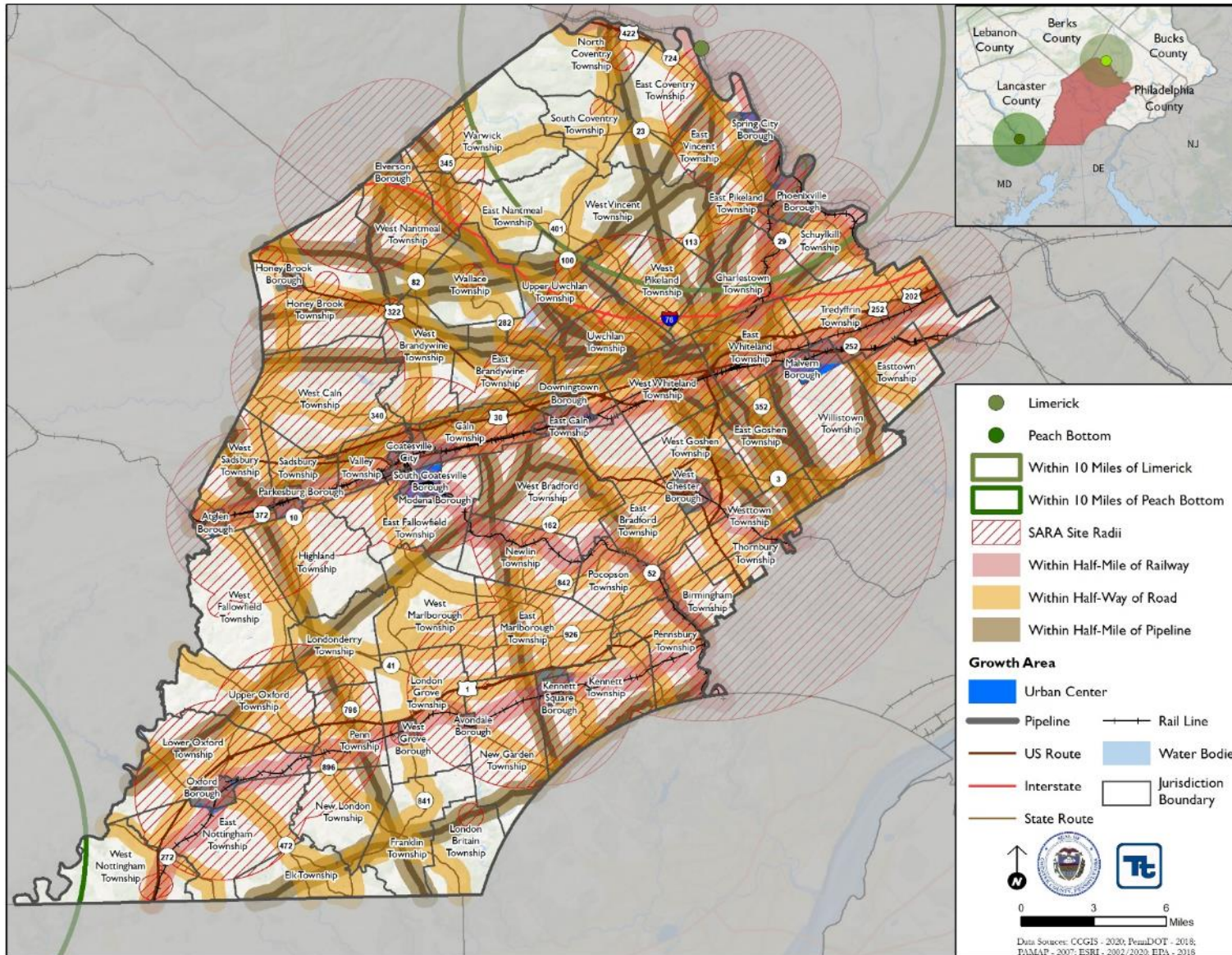




Figure 4.4-8. Urban Growth Centers in Hazmat and Nuclear Hazard Areas





SECTION 5 CAPABILITY ASSESSMENT

The capability assessment evaluates the community’s capabilities and resources already in place at the municipal, county, state, and federal levels to reduce hazard risks. The assessment also identifies where improvements can be made to increase disaster resistance in the community.

The first step in organizing hazard mitigation capabilities or resources is to describe the basic approaches available to reduce hazard risks. According to the 2020 Pennsylvania Emergency Management Agency (PEMA) Hazard Mitigation Planning Standard Operating Guide (SOG), the following four general approaches may reduce hazard risks: (1) reviewing local plans and regulations, (2) modifying structures and infrastructure, (3) protecting natural systems, and (4) promoting education and awareness. A brief description of each (according to the PEMA SOG) is provided below:

- **Local Plans and Regulations** – These actions include government authorities, policies, or codes that influence the ways land and buildings are developed and built.
- **Structure and Infrastructure** – These actions involve modifying existing structures and infrastructure or constructing new structures to reduce hazard vulnerability.
- **Natural Systems Protection** – These actions minimize damage and losses and preserve or restore the functions of natural systems.
- **Education and Awareness** – These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate these hazards, and may also include participation in national programs.

Capability assessments document the existing resources available to local communities to reduce hazard risks. Resources can be divided into five categories: human, physical, technical, informational, and financial. For each basic capability or approach, one or more of the five resources may be available. A brief description of each resource (PEMA 2020) is provided below:

- **Human resources** include local police, fire, ambulance, and emergency management and response personnel; local government services; and electric, gas, and other utility providers that are critical during disasters.
- **Physical resources** include the equipment and vehicles (such as emergency response and recovery equipment and vehicles), public lands, facilities, and buildings available to the community.
- **Technical/technological resources** include early warning systems, weather alert radios, stream-level monitoring gauges, and 9-1-1 communications systems. Technical/technological resources also include technical requirements established by law, regulation, or ordinance.
- **Informational resources** include materials about disasters and hazard mitigation and planning; these resources are available from a wide variety of sources, such as applicable websites, libraries, and state and federal agencies.
- **Financial resources** identify the sources of funding available for hazard mitigation. Most state and federal grant programs require local communities to provide at least part of the necessary project funding in real dollars or through in-kind services. Local communities should assess their financial capability and identify resources to implement hazard mitigation action plans.

This section describes and summarizes the federal, state, county, and local capabilities to address hazard risk in Chester County.



5.1 UPDATE PROCESS SUMMARY

During the plan update process, Chester County and all participating municipalities were asked to provide an updated assessment of their mitigation planning capabilities. Each municipality was provided with a Capability Assessment Survey based on Appendix 3 of the October 2013 and 2020 editions of the PEMA All-Hazard Mitigation Planning SOG (PEMA 2013, PEMA 2020). The survey was provided to each of the municipal planning points of contact at the Planning Team kickoff meeting. Capability Assessment Surveys, whether completed by hand, electronically, or filled in working alongside the county or planning consultant, are provided in Appendix D.

Chester County has several resources available to implement hazard mitigation initiatives, including emergency response measures; local planning and regulatory tools; administrative assistance and technical expertise; fiscal capabilities; and participation in local, regional, state, and federal programs. These resources enable community resiliency through actions taken before, during, and after a hazard event. Emergency services, manpower, equipment, and fiscal resources are important tools in addressing hazard potential and mitigation in Chester County communities.

This section describes and summarizes the federal, state, county, and local capabilities to address hazard risk in Chester County.

5.2 CAPABILITY ASSESSMENT FINDINGS

A jurisdiction’s ability to effectively manage natural hazard risk is directly related to its level of hazard mitigation capabilities. As such, mitigation strategies developed in coordination with Chester County’s municipalities have a direct effect on establishing new capability functions in the community or strengthening existing capabilities.

Chester County and most of its municipalities updated and completed the Capability Assessment Survey (Appendix D). If municipalities did not update or partially updated their capabilities information, the same information provided by those municipalities for the 2015 Hazard Mitigation Plan (HMP) was carried forward into this plan update.

The following sections further detail the capability assessment findings.

5.2.1 Planning and Regulatory Capability

While municipalities in Pennsylvania must comply with the minimum regulatory requirements established under the Pennsylvania Municipal Planning Code, they otherwise have considerable latitude in adopting ordinances, policies, and programs that can be used to manage natural and non-natural hazard risks. Specifically, municipalities can manage these risks through comprehensive land use planning, hazard-specific ordinances (for example, flood damage prevention, sinkholes, and steep slopes), zoning, site-plan approval, and building code enforcement. When effectively prepared and administered, these regulations can lead to hazard mitigation.

For example, the adoption of the National Flood Insurance Program (NFIP) and the Pennsylvania Flood Plain Management Act (Act 166 of 1978) established minimum floodplain management criteria. A municipality must adopt and enforce these minimum criteria to be eligible for participation in the NFIP. Municipalities have the option of adopting a single-purpose ordinance or incorporating these provisions into their zoning and/or subdivision and land development ordinances or building codes, thereby mitigating the potential impacts of local flooding.

Chester County also has the Transportation Improvement Inventory (TII), a comprehensive record of known transportation needed and projects within the county. The TII is updated biennially and contains projects that have been recommended to the Planning Commission. The 2019 TII included 532 proposed roadway, bridge, bicycle, pedestrian, freight, and transit projects with a total estimated cost of \$4.42 billion (Chester County Planning Commission 2019).



County and Municipal Planning Capabilities

Chester County Comprehensive Plan

A comprehensive plan is a policy document that states objectives and guides the future growth and physical development of a municipality. The comprehensive plan is a blueprint for housing, transportation, community facilities, utilities, and land use. It examines how the past led to the present and charts the community's future path. The Pennsylvania Municipalities Planning Code (MPC) Act 247 of 1968, as reauthorized and amended, requires counties to prepare and maintain a comprehensive plan. In addition, the MPC requires counties to update the comprehensive plan every 10 years. The Chester County Commissioners annually approve a comprehensive 5-year capital improvement plan, which identifies both sources and uses of funds to support strategic objectives. Landscapes3 is the current comprehensive plan for Chester County.

Section 301a.(2) of the MPC requires comprehensive plans to include a plan for land use, which among other provisions suggests that the plan should give consideration to floodplains and other areas of special hazards and other similar uses. The MPC also requires comprehensive plans to include a plan for community facilities and services and recommends giving consideration to storm drainage and floodplain management.

The Chester County Comprehensive Plan is slated to guide Chester County until 2028. The comprehensive plan was adopted in 2018 and addresses the following plan elements:

- Housing
- Social Services
- Economic Development
- Transportation
- Recreation / Open Space / Natural Resources / Historic Resources
- Public Utilities / Services / Facilities
- Land Use

Each plan element includes a profile, trends, conclusions, and policy statements as well as an implementation matrix.

Implementation recommendations for housing include: provide housing policy and ordinance assistance; identify new approaches for affordable housing; explore public/private partnerships for workforce housing; and promote universal design in housing and public spaces. These implementation recommendations could ensure stronger building codes or code enforcement to make housing less vulnerable to hazards.

Implementation recommendations for social services include: promote impactful public health policy and services; promote healthy lifestyle choices; promote increased access to fresh, healthy, and local food; provide exemplary emergency services; support emergency service responders; enhance and expand recreational opportunities; support human and social services to serve evolving community needs; and integrate education facilities with communities. These implementation recommendations could ensure stronger public health policies and promote a healthier and more resilient community to make social services less vulnerable to hazards.

Implementation recommendations for economic development include: expand workforce development; create a redevelopment program; support flexible zoning; retain and expand existing businesses; market county's location and amenities; create and grow businesses; ensure economic development strategies remain responsive; revitalize urban center; encourage suburban center investment; support agricultural economic development; and expand heritage tourism programs; and expand historic interpretation and education. Zoning can be used to minimize development in hazard-prone areas. Revitalizing an urban center could result in structures that were built using older codes being replaced with structures built according to newer, stronger ones, making economic development less vulnerable to hazards.

Implementation recommendations for transportation include: advance transportation improvements; advance multimodal transportation; embrace smart transportation improvements for roadways; conduct a freight study; promote bus service within growth areas; expand regional rail service; and create a countywide, interconnected



trail network. Making bus and rail services dependable and available could reduce the number of vehicles on the road, therefore reducing transportation accidents, making transportation less vulnerable to hazards.

Implementation recommendations for recreation, open space/natural resources/historic resources include: update historic resource inventories; expand preservation training; foster creation of historic funding programs; enhance the historical record of the county; promote adaptive reuse and compatible development; promote benefits of natural resource protection; provide natural resource policy and ordinance assistance; enhance countywide water resources planning; monitor impacts of change on water resources; enhance stormwater technical assistance and collaboration; promote innovative practices for improved water quality; enhance flood resiliency; expand open space education, increase protected farmlands; expand protection of natural habitats; create additional recreation properties; enhance protection of historic resources; expand the network of protected open space; encourage restoration and stewardship; support open space polices and ordinances; and convene open space summits. Enforcing land and water resources policies, as well as preserving historic structures, will protect open space and natural and cultural resources from being built on or destroyed.

Implementation recommendations for public utilities/services/facilities include: enhance pipeline safety and communication; support a resilient and clean energy network; integrate water, sewer, and land use planning; implement county solid waste plan; and support municipal on-lot sewage management programs. Implementing pipeline, water, sewer and land programs and policies could decrease pipeline leaks, increase clean energy, and protect water and sewer facilities, making public utilities/services/facilities less vulnerable to hazards.

Although the MPC requires that municipal plans be in accord with the county plan, the code provides no measures for ensuring this occurs. Several municipalities have adopted single- or multi-jurisdictional regional comprehensive plans.

Stormwater Management Planning

In 1978, the Pennsylvania General Assembly passed the Stormwater Management Act (Act 167) of 1978 (Pennsylvania State Data Center 1978). Act 167 requires counties to prepare stormwater management plans on a watershed-by-watershed basis. The plans must be developed in consultation with the affected municipalities. Each new plan is required to provide standards for control of runoff from new development, based on a detailed hydrologic assessment. A key objective of each plan is to coordinate the stormwater management decisions of the watershed municipalities. Implementation of each plan is through mandatory municipal adoption of ordinance provisions consistent with the plan.

Plans prepared under Act 167 will not resolve all drainage issues. A key goal of the planning process is to maintain existing peak runoff rates throughout a watershed as land development continues to take place. While the planning process does not solve existing flooding problems, it aims to prevent these problems from getting worse. Each municipality is responsible for correcting existing flooding problems.

In July 2013, Chester County developed the Act 167 Stormwater Management Plan for Chester County called “Watersheds, An Integrated Water Resources Management Plan for Chester County, PA and its Watersheds.” All 73 municipalities have adopted Act 167 stormwater management ordinances (Chester County 2013). Phase 1 of the “Watersheds, An Integrated Water Resources Management Plan for Chester County, PA and its Watersheds” includes:

- A summary of county watershed characteristics
- An inventory of relevant problems and opportunities
- The vision and planning framework

The plan is designed to provide consistency in stormwater management planning, regulation, and implementation; provide an integrated stormwater management plan; provide useable technical information in a geographic information systems (GIS) format; and provide technical information for future hydrologic and hydraulic analysis and regulatory activities.

According to Section 11(b) of Act 167, municipalities subject to the Stormwater Management Plan must enact or amend and implement such ordinances as necessary to regulate development in a manner consistent with the Stormwater Management Plan. Municipalities are encouraged to use the model ordinance included in the plan.



Open Space and Natural Resource Planning

Chester County has prepared several plans with the goal of preserving open space in the county for recreational and environmental purposes. These plans include chapters in the Chester County Comprehensive Plan Landscape3 (Chester County Planning Commission 2018), “Linking Landscapes,” and “Watersheds, An Integrated Water Resources Management Plan for Chester County, PA and its Watersheds.”

Transportation Improvement Program

Along with the TII, Chester County also participates in the Transportation Improvement Program (TIP). The TIP is the region’s agreed-upon list of specific priority projects. The TIP lists all projects that intend to use federal funds along with non-federally funded projects that are regionally significant. The list is multimodal; in addition to the more traditional highway and public transit projects, it includes bicycle, pedestrian, and freight-related projects as well.

Informational Resources

Chester County has a variety of informational resources available. Informational resources include websites, brochures, pamphlets, workshops, and public service announcements PSAs.

- The Department of Emergency Services (DES) has an informational website located at <https://www.chesco.org/217/Emergency-Services>
- The Department of Emergency Services (DES) Facebook Page is located at <https://www.facebook.com/CCDES/>
- The county’s website is located at <https://www.chesco.org/>.
- The county’s Facebook page is located at <https://www.facebook.com/ChesCoGovt/>
- Chester County’s official source for emergency information and government notifications is located at <http://www.readychesco.org/>
- Information on hazard mitigation and preparedness was referenced at the websites for Federal Emergency Management Agency (FEMA) (www.fema.gov) and PEMA (www.pema.pa.gov).

Chester County Health Department

The mission of the Chester County Health Department is to provide personal and environmental health services to residents and visitors so that they may grow, live, and work in healthy and safe communities. The Health Department is responsible to the County Commissioners through a five-member Board of Health, all Chester County residents. Services are available to all Chester County residents regardless of race, color, religious creed, ancestry, national origin, age, handicap, or sex.

Chester County Department of Emergency Services

The Chester County Department of Emergency Services (DES) maintains a strong emergency management capability that supports Chester County. The county operates an emergency 9-1-1 call center and activates its own emergency operations center (EOC) during emergencies. In addition, the county provides or supports emergency service programs and measures, including emergency response; training coordination and administration; disaster response planning, coordination, recovery, and mitigation; hazardous materials emergency response; and fire prevention and investigation. Capabilities include the 9-1-1 center, Pulsepoint, EOC, emergency service measures, emergency response planning, public information programs, and GIS services, which are described in the sections below.

9-1-1 Center

9-1-1 is the telephone number used to report emergencies. Citizens use the service in the event of the presence or potential for an immediate threat to life or property and to request response from police, fire, or emergency medical services (EMS) agencies. Examples include reporting a crime that has just occurred or is in progress; describing an odor such as gas or reporting a fire; or calling for assistance with a sick or injured person who requires treatment and possibly transportation to a hospital emergency department. The 9-1-1 system is capable



of accepting calls from hearing or speech-impaired callers using a Telecommunications Device for the Deaf (TDD), and text messages. The center also has a translation service for over 200 languages. Each county in Pennsylvania operates a 9-1-1 Public Safety Answering Point (PSAP). Personnel at these PSAPs would need to coordinate their efforts in a regional hazard event. Computerized mapping of streets with address information is critical for emergency response purposes. The 9-1-1 center is also used to alert citizens during an emergency.

Emergency Operations Center

In the event of an impending emergency or disaster, Chester County would activate its EOC. When activated, the EOC is in constant communication with the 9-1-1 center to ensure coordination of activities. The EOC is located in the Chester County Government Services Center in West Chester.

The DES capabilities fall under two categories: emergency service measures and emergency response planning. These capabilities are described below.

Emergency Operations Plan

The Pennsylvania Emergency Management Services Code, Title 35, requires all political jurisdictions in the Commonwealth to have an Emergency Operations Plan (EOP), an Emergency Management Coordinator (EMC), and an EOC.

The Chester County EOP documents the county's emergency preparedness planning. The EOP includes county-specific emergency response procedures during significant emergency events. Chester County's EOP complies with the National Incident Management System (NIMS) and is updated every 2 years. The updated risk assessment information from this HMP will be incorporated into subsequent updates to the EOP.

Mutual Aid Agreements

Chester County has mutual aid agreements (formal agreements) with the contiguous Pennsylvania counties as a result of the Pennsylvania Intrastate Mutual Assistance Program. Every county participates in this program. Chester County is part of a larger county consortium, the Southeastern Pennsylvania Regional Task Force (SEPA-RTF), which works together and shares resources during times of emergency. Originally formed in response to a growing awareness of the threat of terrorism, the Task Force's focus has broadened to include an all-hazards approach. SEPA-RTF works to prevent, prepare for, respond to, and recover from all types of emergencies and disasters. This intergovernmental agreement is between the following counties:

- Bucks
- Chester
- Delaware
- Montgomery
- Philadelphia

Pulsepoint

The county is a participating member in Pulsepoint, an application (app) that empowers everyday citizens to provide life-saving assistance to victims of sudden cardiac arrest. App users who have indicated they are trained in cardiopulmonary resuscitation (CPR) and willing to assist in case of an emergency can be notified if someone nearby is having a cardiac emergency and may require CPR. If the cardiac emergency is in a public place, the location-aware application will alert users in the vicinity of the need for CPR simultaneous with the dispatch of advanced medical care. The application also directs these potential rescuers to the exact location of the closest Automated External Defibrillator (AED) (Chester County n.d.).

Regional Planning Initiatives

Chester County also assists in county or regional planning and preparation for the following:

- Local (municipal) EOPs



- Medical facilities
- Dams
- Airports
- Pandemic
- Mass casualty/fatality incidents
- Counterterrorism preparedness
- Special events, such as concerts, parades, etc.
- School emergency planning
- Day care, group home, and special needs facilities
- Superfund Amendments and Reauthorization Act of 1986 (SARA) – The Local Emergency Planning Committee program is based on the SARA of 1986, Title III. This legislation requires local planning by businesses and response agencies (such as fire departments and hazardous materials teams) whenever hazardous materials are involved. SARA also requires the establishment of a system in each community that informs the citizens of chemicals used, manufactured, and stored locally.
- In cooperation with the American Red Cross, the county has designated shelters that may be used during emergencies and disasters.

Local Emergency Management Capabilities

According to Pennsylvania Title 35 (Emergency Management Services Code), Chapter 75, the following stipulations apply:

- Each political subdivision of this Commonwealth is directed and authorized to establish a local emergency management organization in accordance with the plan and program of PEMA. Each local organization shall have responsibility for emergency response and recovery within the territorial limits of the political subdivision within which it is organized and, in addition, shall conduct such services outside of its jurisdictional limits as may be required under this part.
- The governing body of a political subdivision may declare a local disaster emergency upon finding a disaster has occurred or is imminent. The effect of a declaration of a local disaster emergency is to activate the response and recovery aspects of any and all applicable local emergency management plans and to authorize the furnishing of aid and assistance.
- Each local organization of emergency management shall have a coordinator who shall be responsible for the planning, administration, and operation of the local organization.
- Each political subdivision shall adopt an Intergovernmental Cooperation agreement with other political subdivisions to accomplish the following:
 - Prepare, maintain, and keep current a disaster emergency management plan for (1) the prevention and minimization of injury and damage caused by a disaster, (2) prompt and effective response to disaster, and (3) disaster emergency relief and recovery consistent with the Pennsylvania Emergency Management Plan.
 - Establish, equip, and staff an EOC (integrated with warning and communication systems) to support government operations in emergencies and provide other essential facilities and equipment for agencies and activities assigned emergency functions.
 - Provide individual and organizational training programs to ensure prompt, efficient, and effective disaster emergency services.
 - Organize, prepare, and coordinate all locally available manpower, materials, supplies, equipment, facilities, and services necessary for disaster emergency readiness, response, and recovery.



- Adopt and implement precautionary measures to mitigate the anticipated effects of a disaster. Execute and enforce such rules and orders adopted by the agency, and promulgate under the authority of this part.
 - Cooperate and coordinate with any public and private agency or entity in achieving any purpose of this part.
 - Have available for inspection at its EOC all emergency management plans, rules, and orders of the Governor and PEMA.
 - Provide prompt and accurate information regarding local disaster emergencies to appropriate Commonwealth and local officials and agencies and the general public.
 - Participate in all tests, drills, and exercises—including remedial drills and exercises—scheduled by the agency or by the federal government.
 - Participate in the program of integrated flood warning systems under Section 7313 (6) (relating to powers and duties).
- Direction of disaster emergency management services is first the responsibility of the lowest level of government affected. When two or more political subdivisions within a county are affected, the county organization shall exercise responsibility for coordination and support to the area of operations. When two or more counties are involved, coordination shall be provided by PEMA or by area organizations established by PEMA.
 - When all appropriate locally available forces and resources are fully committed by the affected political subdivision, assistance from a higher level of government shall be provided.
 - Local coordinators of emergency management shall develop mutual aid agreements with adjacent political subdivisions for reciprocal emergency assistance. The agreements shall be consistent with the plans and programs of PEMA.

All 73 municipalities in Chester County have an Emergency Management Coordinator and an Emergency Operations Plan to meet the requirements of Pennsylvania Title 35 (Emergency Management Services Code), Chapter 75.

Mutual Aid Agreements

Chester County has formal mutual aid agreements in place with its municipalities.

Emergency Operations Centers

In the event of an impending emergency or disaster, the local EOC may be activated. The purpose of the EOC is to manage the emergency response and coordinate distribution of resources to a disaster incident at the local level.

Emergency Response

Each municipality is responsible for providing emergency response services to their municipality, consisting of EMS, fire, and police. If a municipality does not have one of these providers in their community, they should have mutual aid agreements with an adjacent political subdivision or the Commonwealth (e.g., law enforcement coverage by the Pennsylvania State Police [PSP]) to respond.

Monitoring Systems

The municipalities may also be equipped with several systems to monitor emergency information and warnings, including the Radio Amateur Civil Emergency Service (RACES) and the National Weather Service (NWS), which have been described previously.

Emergency Response Planning

The municipalities may also assist with planning for:

1. Municipal EOPs





2. Medical facilities
3. Dams
4. Counterterrorism preparedness
5. Special events
6. School emergency planning
7. Day care, group homes, and special needs facilities
8. Evacuation

A summary of existing federal, state, regional, and county programs (regulatory and otherwise) to manage specific hazard risks is provided in the hazard profiles in Section 4 of this plan update. While the risk of certain hazards can be addressed at least partially through mitigation, the risks of other hazards (particularly certain non-natural hazards) are primarily managed through the preparedness and response elements of emergency management or through other regulatory programs at the federal and state levels.

Participation in the National Flood Insurance Program

According to FEMA’s 2002 NFIP: Program Description, the U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 (FEMA 2002). The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages.

Participation in the NFIP is based on an agreement between communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction and substantial improvements in floodplains, the federal government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an alternative to disaster assistance and reduce the escalating costs of repairing damage to buildings and their contents caused by floods (FEMA 2002).

NFIP-participating communities in Chester County are required to adopt a flood damage prevention ordinance (also sometimes called a “floodplain” or “floodplain management” ordinance) and update this ordinance whenever the regulatory NFIP Flood Insurance Rate Maps (FIRM) are officially updated. The Pennsylvania Department of Community and Economic Development (PA DCED) (the statutorily-identified agency responsible for NFIP coordination) and PEMA (the agency that provides NFIP coordination across the Commonwealth) provide support to municipalities by providing suggested text for floodplain management ordinances.

All of the county’s municipalities participate in the NFIP. FIRMs for Chester County’s municipalities were made effective in September 2017. All participating municipalities have adopted a floodplain ordinance, and many have adopted a stormwater management ordinance. Information on how municipalities administer their floodplain management programs was captured on an NFIP Survey. Chester County received completed surveys from 27 of the 73 municipalities; they are included in Appendix D.

The municipalities’ floodplain administrators, who are often either the code enforcement officer or zoning officer for the municipality, locally enforce the floodplain ordinances. Throughout Chester County, all municipalities enforce the Uniform Construction Code, and most enforce zoning regulations. Rather than using a specific Floodplain Development Permit, the county’s municipalities use a zoning or building permit application that includes a space for applicants to state whether the proposed development is in the floodplain. The permit application reviewer confirms whether the property in question is in the floodplain. If it is, the municipal floodplain administrator reviews the proposed development against the municipality’s floodplain management ordinance. The floodplain administrator conducts similar reviews of any revisions to the permit application until all requirements are met. As the proposed activity is conducted, the floodplain administrator works with the code enforcement officer and/or zoning officer to conduct inspections and ensure that the proposed activity is carried out as it was permitted.

NFIP-participating communities in Chester County are required to make current NFIP FIRMs available to their residents for review and may provide mapping assistance through their floodplain administrators. Typically, this mapping is available at the municipal offices in each community. Floodplain administrators provide information



about mapping to their residents using established outreach methods, such as municipal websites, newsletters, and mailings. At the time of this plan update, the Chester County FEMA Digitized Flood Insurance Rate Maps (DFIRM) (dated September 2017) were used to evaluate exposure and determine potential future losses.

Floodplain administrators also use established outreach methods to provide information about flood insurance to residents and business owners. They can provide information on the availability of flood insurance, how to obtain a flood insurance policy, and methods to determine the appropriate level of coverage.

Municipal participation in and compliance with the NFIP is supported at the federal level by FEMA Region III and the Insurance Services Office (ISO) and at the state level by the PA DEP, PA DCED, and PEMA. The County’s Planning Commission and Conservation District also support flood mitigation efforts, associated training, and public education and awareness programs. Table 5-1 shows recent Community Assistance Visits for each municipality.

Table 5-1. Community Assistance Visits (CAV)

Municipality	CID	CAV Date	Municipality	CID	CAV Date
Atglen Borough	420273C	---	North Coventry Township	420283C	9/18/1981
Avondale Borough	421473C	10/29/1991	Oxford Borough	420284C	1/3/1991
Birmingham Township	421474C	5/28/1987	Parkesburg Borough	422277C	---
Caln Township	422247C	2/10/2006	Penn Township	421487C	---
Charlestown Township	421475C	---	Pennsbury Township	420285C	11/5/1992
Coatesville City	420274C	6/7/1991	Phoenixville Borough	420287C	9/29/2011
Downingtown Borough	420275C	9/19/2011	Pocopson Township	420286C	9/3/1986
East Bradford Township	420276C	9/9/2011	Sadsbury Township	421488C	---
East Brandywine Township	421476C	---	Schuylkill Township	421489C	10/28/1991
East Caln Township	421477C	7/24/1985	South Coatesville Borough	420288C	---
East Coventry Township	421478C	11/20/1987	South Coventry Township	421490C	7/24/1992
East Fallowfield Township	421479C	---	Spring City Borough	420289C	8/9/1983
East Goshen Township	420277C	4/23/1993	Thornbury Township	420290C	1/31/1979
East Marlborough Township	421480C	---	Tredyffrin Township	420291C	7/23/1992
East Nantmeal Township	421481C	10/28/1991	Upper Oxford Township	422278C	---
East Nottingham Township	421482C	---	Upper Uwchlan Township	421491C	11/19/1992
East Pikeland Township	421483C	2/3/1987	Uwchlan Township	421492C	11/19/1992
East Vincent Township	420278C	1/17/1981	Valley Township	421206C	---
East Whiteland Township	420279C	---	Wallace Township	421493C	---
Easttown Township	422600C	7/24/1985	Warwick Township	421494C	10/28/1991
Elk Township	422286C	---	West Bradford Township	421495C	2/3/1987
Elverson Borough	422287C	1/25/2008	West Brandywine Township	421496C	---
Franklin Township	422288C	---	West Caln Township	421497C	---
Highland Township	422289C	---	West Chester Borough	420292C	9/27/2011
Honey Brook Borough	422692C	---	West Fallowfield Township	422602C	---
Honey Brook Township	422290C	4/27/1990	West Goshen Township	420293C	9/22/2011
Kennett Square Borough	420280C	1/3/1991	West Grove Borough	422279C	---
Kennett Township	422586C	---	West Marlborough Township	421498C	10/28/1991
London Britain Township	422273C	---	West Nantmeal Township	422280C	---
London Grove Township	422274C	---	West Nottingham Township	421151C	---



Municipality	CID	CAV Date	Municipality	CID	CAV Date
Londonderry Township	421484C	---	West Pikeland Township	422281C	---
Lower Oxford Township	421485C	---	West Sadsbury Township	421499C	10/28/1991
Malvern Borough	420281C	1/23/2008	West Vincent Township	420295C	11/10/1980
Modena Borough	420282C	---	West Whiteland Township	420294C	12/15/1980
New Garden Township	422275C	---	Westtown Township	422282C	---
New London Township	422276C	---	Willistown Township	420273C	---
Newlin Township	421486C	---			

Flood hazard risk management in Chester County is further supported by the Act 167 “Watersheds, An Integrated Water Resources Management Plan for Chester County, PA and its Watersheds” (see above). Ideally, this plan will continue to reduce the effects of flooding in certain areas of the county.

Additional information on the NFIP program and its implementation within the county can be found in the flood hazard profile in Section 4.3.7.

Community Rating System (CRS)

In the 1990s, the Flood Insurance Administration (FIA) established the CRS to encourage local governments to increase their standards for floodplain development. The goal of the program was to encourage communities, through flood insurance rate adjustments, to implement standards beyond the minimum required in order to:

- Reduce losses from floods
- Facilitate accurate insurance ratings
- Promote public awareness of the availability of flood insurance

The CRS is a voluntary program designed to reward participating jurisdictions for their efforts to create more disaster-resistant communities using the principles of sustainable development and management. By enrolling in CRS, municipalities can leverage greater flood protection while receiving flood insurance discounts.

There are 10 CRS classes that provide varied reduction in insurance premiums. Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction. CRS premium discounts on flood insurance range from 5 percent for Class 9 communities up to 45 percent for Class 1 communities. The CRS recognizes 18 creditable activities that are organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.

Currently, no Chester County municipalities participate in the CRS Program. Increased participation will be supported by the county and will be promoted through the local emergency management coordinators, as identified in the updated mitigation strategies.

Municipal Capabilities

Participating municipalities in this planning effort were provided with a Capability Assessment Survey. Table 5-2 summarizes the responses of the municipalities based on planning and regulatory capability, supplemented by information received from the county regarding municipal capabilities. Detailed information regarding Chester County municipalities’ planning and regulatory capabilities can be found in the municipal survey responses provided in Appendix D.



Table 5-2. Planning and Regulatory Capability

Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	COOP Plan	NFIP	NFIP - CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
Chester County	X	X	-	X	X	N/A	N/A	N/A	-	N/A	N/A	X	X	X	X	X	X	X	X	N/A	X	
Atglen Borough	X	X				X	-	X	X	X	X	X		X		X		-		X		
Avondale Borough	X	X				X	-	X	X	X	X	X		X		-		-		X	-	
Birmingham Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Caln Township	X	X	+	+	+	X	-	X	+	X	X	X	X	X	X	X	X	X	-	X	X	
Charlestown Township	X	X				X	-	X	X	X	X	X		X		-		-		X		
Coatesville City	X	X				X	-	X	X	X	X	X		X		X		X		X		
Downingtown Borough	X	X				X	-	X	X	X	X	X		X		X		X		X		
East Bradford Township	X	X	-	-	-	X	-	X	X	X	X	X	X	X	X	X	-	X	-	X	X	
East Brandywine Township	X	X	-	X	-	X	-	X	X	X	X	X	X	X	X	X	-	X	X	X	X	
East Caln Township	X	X				X	-	X	X	X	X	X		X		-		-		X		
East Coventry Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
East Fallowfield Township	X	X				X	-	X	X	X	X	X		-		-		X		X		
East Goshen Township	X	X	-	-	-	X	-	X	-	X	X	X	X	X	-	X	-	-	-	X	X	
East Marlborough Township	X	X	-	-	-	X	-	-	-	X	X	X	X	X	-	X	-	-	-	X	-	
East Nantmeal Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
East Nottingham Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
East Pikeland Township	X	X	-	-	-	X	-	X	X	X	X	X	X	X	X	-	X	X	-	X	X	
East Vincent Township	X	X				X	-	X	X	X	X	X		X		X		-		X		
East Whiteland Township	X	X	-	-	+	X	-	X	-	X	X	X	+	X	X	X	-	X	-	X	X	
Easttown Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
Elk Township	X	X			-	X	-	X	X	X	X	X		X		-		-		X		



Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	COOP Plan	NFIP	NFIP – CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farm and Preservation	Building Code	Fire Code	Other
Elverson Borough	X	X				X	-	X	X	X	X	X		X		X		X		X		
Franklin Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
Highland Township	X	X				X	-	X	X	X	X	X		X		X		-		X		
Honey Brook Borough	X	X	X	X	X	X	-	+	+	X	X	X	X	X	X	X	+	+	+	-	+	
Honey Brook Township	X	X	X	X	X	X	-	+	+	X	X	X	X	X	X	X	+	+	+	-	+	
Kennett Square Borough	X	X		X	X	X	-	X	X	X	X	X	X	X		X	X	X		X		
Kennett Township	X	X	-	-	-	X	-	X	X	X	X	X	-	X	-	X	-	X	-	X	-	
London Britain Township	X	X	-	-	-	X	-	X	X	X	X	X	X	X	-		-	X	X	X	X	-
London Grove Township	X	X	-	-	X	X	-	X	X	X	X	X	X	X	-	X	-	X	X	X	X	X
Londonderry Township	X	X	-	-	-	X	-	X	X	X	X	X	-	X	-	-	-	-	-	X	-	
Lower Oxford Township	X	X	-	X	-	X	-	X	-	X	X	X	X	X	-	X	-	X	X	X	X	X
Malvern Borough	X	X				X	-	X	X	X	X	X		X		X		X		X		
Modena Borough	X	X				X	-	X	X	X	X	X		X		-		X		X		
New Garden Township	X	X	-	-	-	X	-	X	X	X	X	X	X	X	X	-	-	X	-	X	X	
New London Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Newlin Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
North Coventry Township	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	-	-	-	-	X	X	
Oxford Borough	X	X	X	X	-	X	-	X	X	X	X	X	-	+	-	+	X	X	-	X	-	
Parkesburg Borough	X	X	X	X	X	X	-	X	X	X	X	X	-	X	-	-	-	-	X	X	X	
Penn Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Pennsbury Township	X	X	-	-	X	X	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	
Phoenixville Borough	X	X				X	-	X	X	X	X	X		X		X		X		X		
Pocopson Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Sadsbury Township	X	X				X	-	X	X	X	X	X		X		X		X		X		



Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	COOP Plan	NFIP	NFIP – CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
Schuylkill Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
South Coatesville Borough	X	X				X	-	X	X	X	X	X		X		-		X		X		
South Coventry Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Spring City Borough	X	X				X	-	X	X	X	X	X		X		-		-		X		
Thornbury Township	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X	-	X	-	X	X	
Tredyffrin Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Upper Oxford Township	X	X	-	-	-	X	-	X	X	X	X	X	X	X	X	-	-	X	X	X	-	
Upper Uwchlan Township	X	X	+	X	X	X	-	X	X	X	X	X	X	X	-	X	-	X	-	X	-	
Uwchlan Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
Valley Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Wallace Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
Warwick Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
West Bradford Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
West Brandywine Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
West Caln Township	X	X	-	X	-	X	-	X	-	X	X	X	X	X	-	+	-	X	X	X	X	
West Chester Borough	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
West Fallowfield Township	X	X				X	-	X	X	X	X	X		X		X		-		X		
West Goshen Township	X	X				X	-	X	X	X	X	X		X		-		-		X		
West Grove Borough	X	X	-	-	-	X	-	X	X	X	X	-	X	-	-	-	-	-	-	X	-	
West Marlborough Township	X	X				X	-	X	X	X	X	X		X		-		-		X		
West Nantmeal Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
West Nottingham Township	X	X	-	-	-	X	-	-	X	X	X	X	X	X	-	-	-	X	-	X	-	
West Pikeland Township	X	X				X	-	X	X	X	X	X		X		-		X		X		
West Sadsbury Township	X	X				X	-	X	X	X	X	X		X		-		-		X		



Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	COOP Plan	NFIP	NFIP – CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
West Vincent Township	X	X				X	-	X	X	X	X	X		X		-		-		X		
West Whiteland Township	X	X	X	-	-	X	-	X	-	X	X	X	X	X	X	X	-	X	-	X	X	
Westtown Township	X	X				X	-	X	X	X	X	X		X		X		X		X		
Willistown Township	X	X				X	-	X	X	X	X	X		X		X		X		X		

Notes:

“X” indicates that the municipality currently has this capability in place.

“-” indicates no capability is currently in place.

“+” indicates that the capability is under development.

“N/A”: Not applicable

Blank space indicates no response was received from the municipality.



5.2.2 Administrative and Technical Capability

Administrative capability is described as the adequacy of departmental and personnel resources for the implementation of mitigation-related activities. Technical capability relates to an adequacy of knowledge and technical expertise of local government employees or the ability to contract outside resources for this expertise in order to effectively execute mitigation activities. Common examples of skillsets and technical personnel needed for hazard mitigation include: planners with knowledge of land development/management practices, engineers or professionals trained in construction practices related to buildings and/or infrastructure (e.g., building inspectors), planners or engineers with an understanding of natural and/or human-caused hazards, emergency managers, floodplain managers, land surveyors, scientists familiar with hazards in the community, staff with the education or expertise to assess community vulnerability to hazards, personnel skilled in geographic information systems, resource development staff or grant writers, and fiscal staff to handle complex grant application processes.

Municipalities are further supported by county, regional, state, and federal administrative and technical capabilities. For this HMP, the majority of support agencies and resources have been identified and referenced throughout this plan update.

It is noted that the county and many of its municipalities have identified specific mitigation initiatives described in this plan update, which will help build and enhance mitigation-related administrative and technical capabilities in Chester County.

Federal and Commonwealth Capabilities

Federal agencies that can provide technical assistance for mitigation activities include but are not limited to:

- Department of Housing and Urban Development
- Department of Agriculture
- Economic Development Administration
- Emergency Management Institute
- Environmental Protection Agency
- FEMA
- Small Business Administration
- U.S. Army Corps of Engineers

Commonwealth agencies that can provide technical assistance for mitigation activities include but are not limited:

- Pennsylvania Department of Community and Economic Development
- Pennsylvania Department of Conservation and Natural Resources
- Pennsylvania Department of Environmental Protection
- Pennsylvania Emergency Management Agency
- Pennsylvania Silver Jackets

Municipal Capabilities

Participating municipalities in this planning effort were provided with a capabilities survey. Table 5-3 summarizes the responses of the municipalities based on administrative and technical capability. Copies of the individual municipal responses are included in Appendix D.



Table 5-3. Administrative and Technical Capability

Municipality	Planners (with land use/land development knowledge)	Planners or Engineers (with natural and/or human-caused hazards knowledge)	Engineers or Professionals trained in building and/or infrastructure construction practices	Emergency Manager	NFIP Floodplain Administrator	Land Surveyors	Scientists or Staff familiar with the hazards of the community	Personnel skilled in GIS and/or the FEMA HAZUS program	Grant Writers or Fiscal Staff to handle large/complex grants	Staff with expertise or training in Benefit-Cost Analysis	Other
Chester County	X	X	X	X	X	X	X	X	X	-	
Atglen Borough	X	-	-	X	X			-			
Avondale Borough	X	-	-	X	X			-			
Birmingham Township	X	X	X	X	X			-			
Caln Township	X	X	X	X	X	-	-	X	X	X	
Charlestown Township	X	X	X	X	X			-			
Coatesville City	X	X	X	X	X			-			
Downingtown Borough	X	X	X	X	X			X			
East Bradford Township	X	X	X	X	X	X	-	X	X	X	
East Brandywine Township	X	X	X	X	X	X	X	X	-	-	
East Caln Township	X	X	X	X	X			X			
East Coventry Township	X	X	X	X	X			X			
East Fallowfield Township	X	X	X	X	X			X			
East Goshen Township	-	-	X	X	X	-	X	-	X	X	
East Marlborough Township	-	-	-	X	X	-	-	-	-	-	
East Nantmeal Township	X	X	X	X	X			-			
East Nottingham Township	X	X	X	X	X			-			
East Pikeland Township	-	-	-	X	X	-	-	-	X	-	
East Vincent Township	X	X	X	X	X			X			
East Whiteland Township	X	X	X	X	X	-	-	X	X	X	
Easttown Township	X	X	X	X	X			X			
Elk Township	X	X	X	X	X			-			
Elverson Borough	X	X	X	X	X			-			
Franklin Township	X	X	X	X	X			X			
Highland Township	X	X	X	X	X			-			
Honey Brook Borough	-	X	X	X	X	-	-	-	-	-	
Honey Brook Township	-	X	X	X	X	-	-	-	-	-	
Kennett Square Borough	X	X	X	X	X			X			
Kennett Township	-	-	-	X	X	-	X	-	-	X	
London Britain Township	X	X	X	X	X	-	-	-	X	-	
London Grove Township	X	X	X	X	X	-	X	X	-	X	
Londonderry Township	-	-	-	X	X	-	-	-	-	-	



Municipality	Planners (with land use/land development knowledge)	Planners or Engineers (with natural and/or human-caused hazards knowledge)	Engineers or Professionals trained in building and/or infrastructure construction practices	Emergency Manager	NFIP Floodplain Administrator	Land Surveyors	Scientists or Staff familiar with the hazards of the community	Personnel skilled in GIS and/or the FEMA HAZUS program	Grant Writers or Fiscal Staff to handle large/complex grants	Staff with expertise or training in Benefit-Cost Analysis	Other
Lower Oxford Township	X	-	X	X	X	-	-	-	-	-	
Malvern Borough	X	X	X	X	X			X			
Modena Borough	X	X	X	X	X			X			
New Garden Township	X	-	X	X	X	X	-	-	X	X	
New London Township	X	X	X	X	X			X			
Newlin Township	X	X	X	X	X			-			
North Coventry Township	X	X	X	X	X	-	-	-	X	X	
Oxford Borough	-	-	-	X	X	-	-	X	X	-	
Parkesburg Borough	-	X	X	X	X	-	-	X	X	X	
Penn Township	X	X	X	X	X			-			
Pennsbury Township	X	X	X	X	X	-	-	-	-	X	
Phoenixville Borough	X	X	X	X	X			X			
Pocopson Township	X	X	X	X	X			-			
Sadsbury Township	X	X	X	X	X			X			
Schuylkill Township	X	X	X	X	X			X			
South Coatesville Borough	X	X	X	X	X			X			
South Coventry Township	X	X	X	X	X			-			
Spring City Borough	X-	X	X	X	X			X			
Thornbury Township	-	-	-	X	X	-	-	-	X	-	
Tredyffrin Township	X	X	X	X	X			X			
Upper Oxford Township	X	-	-	X	X	-	-	-	-	-	
Upper Uwchlan Township	X	X	X	X	X	X	X	X	X	X	
Uwchlan Township	X	X	X	X	X			X			
Valley Township	X	X	X	X	X			X			
Wallace Township	X	X	X	X	X			-			
Warwick Township	X	X	X	X	X			-			
West Bradford Township	X	X	X	X	X			X			
West Brandywine Township	X	X	X	X	X			-			
West Caln Township	-	X	X	X	X	-	-	-	-	-	
West Chester Borough	-	-	-	X	X	-	-	-	-	-	
West Fallowfield Township	X	X	X	X	X			X	X		
West Goshen Township	-	X	X	X	X			-	-	-	
West Grove Borough	-	-	-	X	X	-	-	-	-	-	



Municipality	Planners (with land use/land development knowledge)	Planners or Engineers (with natural and/or human-caused hazards knowledge)	Engineers or Professionals trained in building and/or infrastructure construction practices	Emergency Manager	NFIP Floodplain Administrator	Land Surveyors	Scientists or Staff familiar with the hazards of the community	Personnel skilled in GIS and/or the FEMA HAZUS program	Grant Writers or Fiscal Staff to handle large/complex grants	Staff with expertise or training in Benefit-Cost Analysis	Other
West Marlborough Township	X	-	-	X	X			-			
West Nantmeal Township	X	X	X	X	X			-			
West Nottingham Township	X	X	X	X	X	-	-	-	-	-	
West Pikeland Township	X	X	X	X	X			X			
West Sadsbury Township	X	X	X	X	X			-			
West Vincent Township	X	X	X	X	X			X			
West Whiteland Township	X	X	X	X	X	-	-	X	X	X	
Westtown Township	X	X	X	X	X			X			
Willistown Township	X	X	X	X	X			X			

Notes:
 “X” indicates that the municipality currently has this capability in place.
 “-” indicates no capability is currently in place.
 Blank space indicates no response was received from the municipality.

5.2.3 Financial Capability

Mitigation projects and initiatives are largely or entirely dependent on available funding. As such, it is critical to identify all available sources of funding at the local, county, regional, state, and federal level to support implementation of the mitigation strategies identified in this plan update.

Jurisdictions fund mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and through myriad federal and state loan and grant programs.

Federal mitigation grant funding (Stafford Act, Sections 404 and 406) (FEMA 2000) is available to all communities with a current HMP (this plan); however, most of these grants require a “local share” in the range of 10 to 25 percent of the total grant amount.

Federal Hazard Mitigation Funding Opportunities

The Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) (Stafford Act, Sections 404 and 406) is a post-disaster mitigation program made available to states by FEMA after each federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures and can be used to fund cost-effective projects to protect public or private property in an area covered by a federal disaster declaration or that projects to reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard-prone areas, flood proofing, or elevation to reduce future damage, minor structural improvements, and development of state or local standards.

Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved HMP. Applicants eligible for the HMGP include state and local governments, certain nonprofit organizations or institutions that perform essential government services, and



Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to PEMA for ranking and submission to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available.

Sections 404 and 406 of the Stafford Act (hazard mitigation funding) are two distinct criteria associated with mitigation funding. Participation in FEMA 404 HMGP may cover mitigation activities, including raising, removing, relocating, or replacing structures within flood hazard areas. FEMA 406 HMGP is applied to parts of a facility that were actually damaged by a disaster and the mitigation measures that provide protection from subsequent events.

Building Resilient Infrastructure and Communities (BRIC) Program

Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the former Pre-Disaster Mitigation (PDM) program.

The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

Flood Mitigation Assistance Program

Flood Mitigation Assistance (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. FMA is funded annually; no federal disaster declaration is required. Only NFIP-insured homes and businesses are eligible for mitigation in this program. Funding for FMA is limited and, as with the HMGP, individuals cannot apply directly. Applications must come from local governments or other eligible organizations.

The federal government cost share for an FMA project is generally 75 percent, but can be 90 percent to protect repetitive loss properties, and 100 percent to protect severe repetitive loss properties. At least 25 percent of the total eligible costs must be provided by a non-federal source, and of this 25 percent, no more than half can be provided as in-kind contributions from third parties. At a minimum, a FEMA-approved local HMP is required before a project can be approved. FMA funds are distributed from FEMA to the Commonwealth. PEMA serves as the grantee and program administrator for FMA.

As of fiscal year 2013, the Severe Repetitive Loss and Repetitive Flood Claims Programs were dismantled and incorporated into the FMA Program. As a result, residential and non-residential properties currently insured with NFIP are eligible to receive FMA funds as long as they meet either the Repetitive Loss Properties (RLP) or Severe Repetitive Loss (SRL) property definitions, as described in Section 4.3.7 of this plan.

Federal Disaster Assistance Programs

Following a disaster, various types of assistance may be made available by local, state, and federal governments. The types and levels of disaster assistance depend on the severity of the damage and the declarations that result from the disaster event. General types of assistance that may be provided, should the President of the United States declare the event a major disaster, include the following:

- Individual Assistance – Provides help for homeowners, renters, businesses, and some nonprofit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses may be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals may borrow up to \$200,000 to repair or replace real estate and \$40,000 to cover losses to personal property. For businesses, loans may be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and



equipment, inventory, and supplies. Businesses of any size are eligible. Nonprofit organizations, such as charities, churches, private universities, etc., are also eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster. These loans are restricted, by law to small businesses only.

- Public Assistance – Provides cost reimbursement aid to local governments (state, county, local, municipal authorities, and school districts) and certain nonprofit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services.

U.S. Department of Housing and Urban Development Community Development Block Grants

The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG) are federal funds intended to provide low- and moderate-income citizens with decent housing, a suitable living environment, and expanded economic opportunities. Eligible activities include improvement of community facilities, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration. Public improvements may include flood and drainage improvements. In limited instances, and during times of “urgent need” (for example, post-disaster) as defined by the CDBG National Objectives, CDBG funding may be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event.

Additional Federal Resources

Weatherization Assistance Program: Minimizes the adverse effects of high-energy costs on low-income, elderly, and disabled citizens through client education activities and weatherization services, such as heating system modifications and insulation (US DOE 2011).

Section 108 Loan Guarantee Programs: Provides loan guarantees as security for federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities and housing (HUD 2011).

U.S. Department of Agriculture: Provides disaster assistance through the following:

- The Emergency Conservation Program provides emergency funding for farmers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures during periods of severe drought.
- The Non-Insured Crop Disaster Assistance Program provides financial assistance for non-insurable crop losses and planting prevented by disasters.

Emergency Watershed Protection Program: Undertakes emergency measures, including the purchase of floodplain easements for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood, or any other natural occurrence is causing or has caused a sudden impairment of the watershed (NRCS 2011). It is not necessary for an emergency to be declared by the President for an area to be eligible for assistance. The program objective is to assist sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a natural disaster. Activities include providing financial and technical assistance to remove debris from streams, protecting destabilized stream banks, establishing cover on critically eroding lands, repairing conservation practices, and purchasing of floodplain easements. The program is designed to establish recovery measures.

Commonwealth Hazard Mitigation Funding Opportunities

Commonwealth programs that may provide financial support for mitigation activities include but are not limited to:

- Community Conservation Partnerships Program



- Community Revitalization Program
- Floodplain Land Use Assistance Program
- Growing Greener Program
- Keystone Communities Grant Program
- Local Government Capital Projects Loan Program
- Land Use Planning and Technical Assistance Program
- Pennsylvania Small Water and Sewer Program
- Pennsylvania Heritage Areas Program
- Pennsylvania Recreational Trails Program
- Shared Municipal Services
- Technical Assistance Program

Marcellus Shale Legacy Fund - Act 13 of 2012

Watershed Restoration and Protection Program (WRPP): Act 13 of 2012 establishes the Marcellus Legacy Fund and allocates funds to the Commonwealth Financing Authority for watershed restoration and protection projects. The overall goal of this program is to restore, and maintain restored stream reaches impaired by the uncontrolled discharge of non-point source polluted runoff, and ultimately to remove these streams from the PA DEP’s Impaired Waters list.

Greenways, Trails and Recreation Program (GTRP): In addition, Act 13 of 2012 allocates funds to the Commonwealth Financing Authority (the “Authority”) for planning, acquisition, development, rehabilitation, and repair of greenways, recreational trails, open space, parks and beautification projects. Projects can involve development, rehabilitation, and improvements to public parks, recreation areas, greenways, trails, and river conservation.

Flood Mitigation Projects: Finally, Act 13 of 2012 allocates funds to the Commonwealth Financing Authority (the “Authority”) for funding statewide initiatives to assist with flood mitigation projects.

While most of the identified fiscal capabilities are available to all of the municipalities in Chester County, the extent to which communities have leveraged these funding sources varies widely. It is expected that communities familiar with accessing grant programs will continue to pursue those grant sources, as appropriate.

Municipal Capabilities

The implementation of mitigation actions requires time and fiscal resources. While some mitigation actions are less costly than others, it is important that funds are available locally to implement policies and projects. Financial resources are particularly important if jurisdictions are trying to take advantage of Commonwealth or federal mitigation grant funding opportunities that require local-match contributions.

Capital Improvement Planning

Capital improvement plans are often recommended by counties to their municipalities because these plans help identify specific capital projects to be funded and completed according to a defined schedule. Some of these projects involve improvements to facilities and infrastructure that provide hazard mitigation benefits. As such, during this update process, the county and its municipalities have been encouraged to consider the mitigation benefits associated with their known or anticipated capital projects as a way to help prioritize their execution and to develop awareness that mitigation grants may be available to help fund such projects.



Special Purpose Taxes

Communities may exercise their taxing authority to raise funds for any project they see fit. This includes special taxes to fund mitigation measures. Spreading the cost of a community project among the community's taxpayers helps provide the greatest public good for relatively low individual cost.

Gas/Electric Utility Fees

In the same way that special taxes can be levied to fund mitigation projects, a community can use another avenue for financing a project, which includes dedicating a portion of homeowners' gas and electric utilities' fees to upgrade and maintain the related infrastructure. Burying transmission lines, thereby mitigating from the effects of winds and ice storms, is expensive. These fees help to offset that cost.

Water/Sewer Fees

Water Authorities and Fees

Water authorities are multipurpose authorities with water projects, many of which operate both water and sewer systems. The financing of water systems for lease back to the municipality is among the principal activities of the local government facilities' financing authorities. An operating water authority issues bonds to purchase existing facilities or to construct, extend, or improve a system. The primary source of revenue is user fees based on metered usage.

The cost of constructing or extending water supply lines can be funded by special assessments against abutting property owners. Tapping fees also help fund water system capital costs. Water utilities are directly operated by municipal governments and by privately owned public utilities regulated by the Pennsylvania Public Utility Commission. The PA DEP has a program to assist with consolidation of small individual water systems to make system upgrades more cost-effective.

The Chester County Board of Commissioners established the Chester County Water Resources Authority (CCWRA) in 1961 under the PA Municipal Authorities Act as a county-wide municipal authority for the purposes of providing flood protection and water resources management for Chester County. CCWRA owns and operates four regional flood control facilities that provided flood protection for 23 municipalities, and a water supply reservoir that serves as a water source for the greater Coatesville region. CCWRA provides planning and technical information; guidance; and assistance to municipalities in other aspects of water resources management, including flood mitigation, stormwater management, water supply planning, source water management, and protection, groundwater management and protection, and stream water quality restoration and protection.

Sewer Authorities and Fees

Sewer authorities include multipurpose authorities with sewer projects. The authorities issue bonds to finance acquisition of existing systems or to finance construction, extension, and improvements. Sewer authority operating revenues originate from user fees. The fee frequently is based on the amount of water consumed, and payment is enforced by the ability to terminate service or the imposition of liens against real estate. In areas with no public water supply, flat rate charges are calculated on average use per dwelling unit.

Stormwater Utility Fees

Stormwater utility fees are assessed and collected to offset the cost of maintaining and upgrading stormwater management structures such as drains, retention ponds, and culverts.

Development Impact Fees

Development impact fees are one-time fees assessed to offset the cost of providing public services to a new development. They may be dedicated to providing the related new water or sewer infrastructure, roads, parks and recreational areas, libraries, schools, etc. The new infrastructure may be less vulnerable to hazard impacts.



General Obligation, Revenue, and/or Special Tax Bonds

Jurisdictions may simply decide to dedicate general fund or similar financing to implement hazard mitigation projects.

Partnering Arrangements or Intergovernmental Agreements

Intergovernmental cooperation is one manner of accomplishing common goals, solving mutual problems, and reducing expenditures. Chester County contains 73 municipalities. Each of these municipalities conducts its daily operations and provides various community services according to local needs and limitations. Each municipality varies in staff size, resource availability, fiscal status, service provision, constituent population, overall size, and vulnerability to the identified hazards.

Table 5-4. Fiscal Capability

Municipality	Capital Improvements Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
Chester County	X	X	X	N/A	N/A	N/A	-	-	-	
Atglen Borough	X	X						X		
Avondale Borough		X						X		
Birmingham Township		-						X		
Caln Township	X	X	X	-	X	-	X	X	-	
Charlestown Township		-						X		
Coatesville City	X	X						X		
Downingtown Borough	X	X						X		
East Bradford Township	X	-	-	-	-	-	-	X	X	
East Brandywine Township	X	X	X	-	X	-	X	X	X	
East Caln Township		X						X		
East Coventry Township	X	X						X		
East Fallowfield Township		X						X		
East Goshen Township	X	-	-	-	X	-	X	X	X	
East Marlborough Township	-	X	-	-	-	-	-	X	-	
East Nantmeal Township		X						X		
East Nottingham Township		X						X		
East Pikeland Township	-	-	-	-	-	-	-	X	-	
East Vincent Township	X	X			X			X		
East Whiteland Township	X	-	-	-	X	-	X	X	X	
Easttown Township	X	X						X		
Elk Township		X						X		
Elverson Borough	X	X						X		
Franklin Township	X	X						X		
Highland Township		X						X		



Municipality	Capital Improvements Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
Honey Brook Borough	X	-	-	X	X	X	X	X	X	
Honey Brook Township	X	-	-	X	X	X	X	X	X	
Kennett Square Borough	X	X			X		X	X	X	
Kennett Township	X	-	-	-	-	-	-	X	-	
London Britain Township	-	-	-	-	X	-	-	X	X	
London Grove Township	X	X	X	-	X	-	-	X	-	
Londonderry Township	-	-	-	-		-	-	X	-	
Lower Oxford Township	X	X	-	-	X	-	-	X	-	
Malvern Borough	X	-	-					X		
Modena Borough		X						X		
New Garden Township	X	X	X	-	X	-	X	X	X	
New London Township		-						X		
Newlin Township		-						X		
North Coventry Township	X	X	X	-	-	-	X	X	X	
Oxford Borough	-	X	-	-	X	-	-	X	X	
Parkesburg Borough	X	X	-	-	-	-	-	X	-	
Penn Township		-						X		
Pennsbury Township	X	-	X	X	X	X	X	X	-	
Phoenixville Borough	X	X						X		
Pocopson Township		-						X		
Sadsbury Township	X	X						X		
Schuylkill Township		-						X		
South Coatesville Borough		X						X		
South Coventry Township		-						X		
Spring City Borough		X						X		
Thornbury Township	X	-	-	-	-	-	-	X	-	
Tredyffrin Township		-						X		
Upper Oxford Township	-	-	-	-	-	-	X	X	X	
Upper Uwchlan Township	X	X	X	-	X	-	X	X	X	
Uwchlan Township	X	-			X			X		
Valley Township	X	X			X			X		
Wallace Township		-						X		
Warwick Township		-						X		
West Bradford Township	X	-						X		
West Brandywine Township	+	X			X			X		
West Caln Township	-	X	X	-	-	-	-	X	X	



Municipality	Capital Improvements Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
West Chester Borough	X	X	-	-	-	-	-	X	-	
West Fallowfield Township	X	-						X		
West Goshen Township	X	X	-	-	X	X	-	X	X	
West Grove Borough		X						X		
West Marlborough Township		-						X		
West Nantmeal Township	X	-						X		
West Nottingham Township	-	-	X	-	-	-	-	X	X	
West Pikeland Township		-						X		
West Sadsbury Township		-						X		
West Vincent Township		-						X		
West Whiteland Township	-	-	-	-	X	X	X	X	X	
Westtown Township	X	-						X		
Willistown Township	X	-						X		

Notes:

“X” indicates that the municipality currently has this capability in place.

“-” indicates no capability is currently in place.

Blank space indicates no response was received from the municipality.

Political Capabilities

Political capability refers to a jurisdiction’s incentive or willingness to accomplish hazard mitigation objectives. Local decision makers may not rank hazard mitigation as a high priority task if there are other, more immediate political concerns. Unfortunately, it often takes a disaster to get people thinking about hazard mitigation. Responding to and recovering from a disastrous event can exhaust local resources, thereby elevating hazard mitigation to the forefront. Cooperation among elected officials, planning commission members, emergency management officials, and others is essential to achieve hazard mitigation objectives. Maintaining open lines of communication and sharing up-to-date information is a crucial step.

Council of Governments

A Council of Governments (COG) is a general, multi-purpose, cooperative organization established to enable a group of municipalities to work together on mutually beneficial projects. A COG has a broad responsibility; it may study and propose new joint programs and projects and is almost always composed of elected officials. A variety of organizations work across municipal boundaries within Chester County and with the Western Chester County COG. In addition, regional emergency management groups have been developed in various areas usually centered on school district boundaries.

5.2.4 Education and Outreach

Education and outreach programs and methods are used to implement mitigation activities and communicate hazard-related information. Examples include obtaining certification in programs such as Firewise and StormReady and developing and communicating hazard awareness and safety information to residents.



At the municipal level, education and outreach capabilities vary. Some municipalities have the capability to handle outreach initiatives, while others rely on county resources. Several municipal websites post local plans and ordinances, and many municipalities post information regarding hazard-related topics. The local fire departments and emergency managers are active in the schools participating in programs, such as fire safety in the fall and attending other community activities to conduct outreach. Appendix D details the outreach and education conducted at the municipal level.

Public Information Programs

Flood Maps

Flood maps and flood data, including 2017 digital maps for Chester County, are available on FEMA's Map Service Center website as well as at the Chester County Water Resources Authority. County and municipality maps, tax maps, and property assessment records are available at the Assessment Office and the GIS Office and deeds are available at the Register and Recorder Office.

Library Education Tools

Libraries have educational materials, available upon request, which are used at public speaking events or county meetings, when appropriate. Educational materials include but are not limited to:

- Various types of training videos
- Pennsylvania emergency preparedness guides
- American Red Cross packets for flash flooding, hurricane, thunder and lightning, tornado, and winter storms
- Family disaster planning guides
- Homeland security information for businesses, family, individuals, neighborhoods, and schools
- Pandemic brochures

Outreach Projects

Several organizations (both public and private sector) have developed outreach projects, educational tools, and training programs. The county promotes both online and traditional in-person programs to appeal to as wide an audience as possible.

- *ReadyPA Campaign*: Established by the Commonwealth of Pennsylvania, www.readypa.org is a website that aims to prepare the public for times of disaster by providing education on the risks within Pennsylvania, template emergency plans and kits, and information on ways to get involved with community organizations to help others.
- Emergency management courses are provided through the county DES to local coordinators and elected officials, including Basic Orientation, Duties and Responsibilities of the Local Emergency Management Coordinator (LEMC), and Damage Assessment.

Local Emergency Planning Committee

The Local Emergency Planning Committee (LEPC) for the Emergency Planning District of Chester County is a partnership to protect the public against risks from hazardous materials. The following features of the LEPC demonstrate the capability of the LEPC to support county emergency management and preparedness initiatives.

- These LEPCs must include elected officials; fire, police, civil defense, and public health professionals; environmental, hospital, and transportation officials, as well as representatives of the facilities, community groups, and the media. The objectives of Chester County's LEPC include:
 1. Establish procedures for receiving and processing requests from the public for information under The Emergency Planning and Community Right to Know Act of 1986; Develop, implement, and exercise the emergency plan required by The Emergency Planning and



Community Right to Know Act of 1986; and carry out the duties enumerated in Act 1990-165.

2. Develop and organize a systematic, efficient, and effective method for providing public education and training opportunities to residents to make communities safer, stronger, and better prepared to respond to the threats of terrorism, crime, public health issues and disasters of all kinds.
 3. Chemicals and other hazardous materials are here to stay. Our economy and lifestyle depend on their use. Most of us are aware of the risks involved but accept them because there are prevention and response plans in place that minimize this risk. The Chester County LEPC is very active in carrying out their responsibilities.
 4. As a citizen, you can be aware of the risks that affect you. Support industry efforts to reduce or manage the risk. Manage the risk at home. Read labels; buy only what you really need to do the job. Volunteer as an emergency responder with your local fire company or ambulance service.
 5. Match the needs of emergency services first responders with the skills and abilities of volunteers.
 6. Promote Citizen Corps activities, programs, and projects.
 7. Enhance community awareness and Citizen Corps participation (Chester County LEPC, n.d.).
- *Reporting Facilities:* The minimum reporting threshold for which facilities are required to have or prepared a Material Safety Data Sheet is 10,000 pounds of hazardous chemicals. This document provides workers and emergency personnel with procedures for handling or working with hazardous materials in a safe manner. It includes information on the chemicals’ physical properties, toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.
 - *Planning Facilities:* The reporting threshold for Extremely Hazardous Substances (as designated under Section 302 of Title III) is 500 pounds or the threshold planning quantity, whichever is lower. Qualifying facilities are subject to additional reports and accident prevention regulations.

Technical Assistance

The County DES can support local, public, and private entities through coordination and provision of information and equipment resources. These include both existing county capabilities and predetermined private and public resources.

Municipalities participating in this planning effort were provided with a Capability Assessment Survey. Table 5-5 summarizes the responses of the municipalities based on education and outreach capabilities. Copies of the individual municipal responses are provided in Appendix D.

Table 5-5. Education and Outreach Capability

Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
Chester County	-	-	X	X	-	X	
Atglen Borough		-					



Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
Avondale Borough		-					
Birmingham Township		-					
Caln Township	-	-	-	X	-	X	
Charlestown Township		-					
Coatesville City		-					
Downingtown Borough		-					
East Bradford Township	-	-	-	-	-	-	
East Brandywine Township	X	-	X	X	-	-	
East Caln Township		-					
East Coventry Township		-					
East Fallowfield Township		-					
East Goshen Township	-	-	-	X	-	-	
East Marlborough Township	-	-	-	-	-	-	
East Nantmeal Township		-					
East Nottingham Township		-					
East Pikeland Township	-	-	-	-	-	-	
East Vincent Township		-					
East Whiteland Township	-	-	-	X	-	-	
Easttown Township		-					
Elk Township		-					
Elverson Borough		-					
Franklin Township		-					
Highland Township		-					
Honey Brook Borough	-	-	-	X	-	-	
Honey Brook Township	-	-	-	X	-	-	
Kennett Square Borough		-					
Kennett Township	-	-	-	-	-	-	
London Britain Township	-	-	-	X	-	X	
London Grove Township	-	-	X	X	-	-	X
Londonderry Township	-	-	-	-	-	-	
Lower Oxford Township	-	-	-	-	-	-	
Malvern Borough		-					
Modena Borough		-					
New Garden Township	-	-	-	X	-	X	



Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
New London Township		-					
Newlin Township		-					
North Coventry Township	-	-	-	X	-	X	
Oxford Borough	-	-	-	-	-	X	
Parkesburg Borough	-	-	-	X	X	X	
Penn Township		-					
Pennsbury Township	-	-	-	-	-	-	
Phoenixville Borough		-					
Pocopson Township		-					
Sadsbury Township		-					
Schuylkill Township		-					
South Coatesville Borough		-					
South Coventry Township		-					
Spring City Borough		-					
Thornbury Township	-	-	X	X	X	X	
Tredyffrin Township		-					
Upper Oxford Township	-	-	-	X	-	X	
Upper Uwchlan Township	-	-	-	X	X	X	
Uwchlan Township		-					
Valley Township		-					
Wallace Township		-					
Warwick Township		-					
West Bradford Township		-					
West Brandywine Township		-					
West Caln Township	-	-	-	X	-	-	
West Chester Borough	-	-	-	-	-	-	
West Fallowfield Township		-					
West Goshen Township	-	-	-	X	-	-	
West Grove Borough		-					
West Marlborough Township		-					
West Nantmeal Township		-					
West Nottingham Township	-	-	-	-	-	-	
West Pikeland Township		-					
West Sadsbury Township		-					



Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
West Vincent Township		-					
West Whiteland Township	-	-	-	X	X	X	
Westtown Township		-					
Willistown Township		-					

Notes:
 “X” indicates that the municipality currently has this capability in place.
 “-” indicates no capability is currently in place.
 Blank space indicates no response was received from the municipality.

5.2.5 Plan Integration

According to FEMA, plan integration is a process where communities critically review their existing planning framework and align their efforts. Integration of hazard mitigation principles into other local planning mechanisms (comprehensive plans, transportation plans, floodplain ordinances, etc.) and vice versa is vital to build a safer, more resilient community. This two-way exchange of information supports community-wide risk reduction, both before and after disasters occur. Not only will the community’s planning efforts be better integrated, but by going through this process, there is a higher level of interagency coordination, which is just as important as the planning mechanisms themselves.

Within Chester County, many existing plans and programs support hazard risk management; thus, it is critical that this HMP integrate and coordinate with, and complement, those mechanisms.

The intention of the Planning Team and participating jurisdictions is to incorporate mitigation planning as an integral component of daily government operations. Planning Team members will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (located in Section 8 of this HMP) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Team anticipates the following:

- 1) Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts.
- 2) Hazard mitigation planning will be formally recognized as an integral part of land use policies and mechanisms.
- 3) The HMP, the county and municipal comprehensive plans, and the county and municipal EOPs will become mutually supportive documents that work in concert to meet the goals and needs of county residents.
- 4) Duplication of effort can be minimized.

As noted in Section 6 of this plan, Chester County has made a concerted effort to reduce its vulnerability to natural and non-natural hazards in its planning and in its daily operations since the Chester County HMP was last updated in 2015. The county and its jurisdictions have implemented various programs and projects to reduce



the impacts of hazards. These projects, programs, and regulations have reduced risk caused by natural and non-natural hazards and support the goals and objectives of this HMP. It is the intent of the county and its participating municipalities to strengthen this focus on mitigation by continuing existing policies and by further implementing the mitigation policies contained in this HMP.

Implementation actions will include incorporating the goals of the HMP into ongoing planning, zoning, building, and engineering activities. Specifically, the county will urge municipalities to take the following actions:

- Fund hazard mitigation projects or actions in operating budgets to the extent possible.
- Notify other municipalities about grant and other funding opportunities as they arise.
- Use data and maps from this HMP as supporting documentation in grant applications.
- Review mitigation actions when allocating funding for the municipal budgets.
- Include hazard mitigation when updating municipal ordinances.
- Identify hazard areas in updates of comprehensive plans to identify land use issues.
- Review the HMP prior to land use or zoning changes and permitting or development decisions.

The information on hazards, risk, vulnerability, and mitigation contained in this HMP is based on the best science and technology available at the time of the plan's preparation. Additionally, certain plans (including blueprints) were incorporated directly into this HMP update. All participating jurisdictions recognize that this information can be invaluable in making decisions under other planning programs, such as comprehensive, capital improvement, and emergency management plans. Figure 5-1 illustrates the interrelationships between the HMP, the Chester County comprehensive plan, the county EOP, and other community planning mechanisms. Existing processes and programs through which the HMP should be implemented are described below.

Plan participants will make every effort to implement the relevant sections and or data contained in the HMP utilizing administrative, budgetary, and regulatory processes as well as partnerships to the maximum extent, as described below.

Administrative

Administrative processes include departmental or organizational work plans, policies, or procedural changes that can be addressed by county departments.

The Chester County DES is responsible for preparing and maintaining the county EOP, including a minimum biennial review. Whenever portions of the plan are implemented in an emergency event or training exercise, a review is performed, and changes are made where necessary. The risk assessment information presented in the 2015 HMP was used to update the Hazard Vulnerability Assessment section of the county EOP. The updated risk assessment information will affect subsequent updates to the EOP. Recommended changes to the HMP, based on changes to the EOP, will then be coordinated with the Planning Team.

The Chester County Planning Commission is responsible for maintaining and updating the county comprehensive plan, which covers all 73 municipalities.

The administrative practices described above will continue through the development of subsequent Chester County comprehensive plan updates using the information in this updated HMP. In return, the Chester County comprehensive plan, located on the Chester County Planning Commission's website, was incorporated into multiple aspects of this HMP. Information from the comprehensive plan and other documents was used to formulate the county profile, identify the history of individual hazards, and detail the population projections in Chester County.

Budgetary Process

In terms of budgetary processes, the county will review capital budgets and, if funding is available, include a line item for mitigation actions. In addition, the county will maximize mitigation aspects of proposed projects and will encourage municipalities to do likewise.



Regulatory Measures

Regulatory measures—such as the creation of executive orders, ordinances, and other directives—will be considered to support hazard mitigation in the following areas:

- Comprehensive Planning – Institutionalize hazard mitigation for new construction and land use.
- Zoning and Ordinances
- Building Codes – Enforce codes or higher standards in hazard areas.
- Capital Improvements Plan – Ensure that the person responsible for projects under this plan evaluates whether new construction is in a high-hazard area (such as a floodplain) so the construction is designed to mitigate the risk. Revise requirements for this plan to include hazard mitigation in the design of new construction.
- NFIP – Continue participation in this program and explore participation in CRS Program.
- Stormwater Management – Continue to implement stormwater management plans and ordinances. Stormwater management plans/ordinances have been developed for nine municipalities with another currently under development.
- HMP Plan Coordination – Prior to formal changes (amendments) to master plans, zoning, ordinances, capital improvement plans, or other mechanisms that control development, all above-mentioned plans must be reviewed to ensure they are consistent with the HMP.

Funding

The county and its jurisdictions will consider multiple grant sources to fund eligible projects. These opportunities may include, but are not limited to:

- Federal
 - Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation Program (PDM)
 - FEMA Flood Mitigation Assistance Program (FMA)
 - FEMA Hazard Mitigation Grant Program (HMGP) – Stafford Act, Section 404
 - U.S. Department of Housing and Urban Development (HUD) – Community Development Block Grant (CDBG)
 - U.S. Department of Agriculture (USDA) – USDA Community Facilities
 - U.S. Economic Development Administration (EDA) Public Works Program
- Commonwealth
 - Pennsylvania Department of Community and Economic Development (DCED) PA Small Water and Sewer
 - Pennsylvania Department of Transportation (PennDOT) Pennsylvania Infrastructure Bank
 - Act 13 of Marcellus Shale Legacy Funds – Flood Mitigation Program
 - Growing Greener
- Regional
 - Appalachian Regional Commission
 - Southwestern Pennsylvania Commission
- Nonprofit organizations, foundations, and private sources

Other potential federal funding sources include:

- Stafford Act, Section 406 – Public Assistance Program Mitigation Grants
- Federal Highway Administration



- Catalog of Federal Domestic Assistance
- U.S. Fire Administration – Assistance to Firefighter Grants
- U.S. Small Business Administration Pre- and Post-Disaster Mitigation Loans
- U.S. Department of Economic Development Administration Grants
- U.S. Army Corps of Engineers
- U.S. Department of Interior, Bureau of Land Management
- Other sources as yet to be defined

Partnerships

The following opportunities for partnerships will be encouraged to provide broader support and understanding of hazard mitigation:

Existing Committees and Councils

- Local Government Committees:
 - Chester County Agricultural Land Preservation Board (<https://www.chesco.org/1366/Farmland-Preservation>)
 - Chester County Conservation District (<https://www.chesco.org/205/Conservation-District>)
 - Chester County Economic Development Council (<https://ccedcpa.com/>)
 - Housing Authority of the County of Chester (<http://www.haccnet.org/>)
 - Chester County Land Bank (<https://housingalliancepa.org/research-and-resources/interactive-land-bank-map/>)
 - Chester County Local Emergency Planning Committee (<https://www.chesco.org/3846/LEPC>)
 - Transportation Management Association of Chester County (TMACC) (<https://www.tmacc.org/>)

Creative Partnerships for Funding and Incentives

- Public-private partnerships, including utilities and businesses
- State cooperation
- In-kind resources

Working with other Federal and Commonwealth Agencies

- U.S. Army Corps of Engineers (USACE)
- Department of Homeland Security (DHS)
- Federal Emergency Management Agency (FEMA)
- National Oceanic and Atmosphere Administration (NOAA)
- National Weather Service (NWS)
- United States Department of Agriculture (USDA)
- United States Department of Transportation (USDOT)
- United States Geological Service (USGS)
- Pennsylvania Department of Transportation (PennDOT)
- Pennsylvania Department of Environmental Protection (PADEP)
- PEMA
- Pennsylvania State Police (PSP)



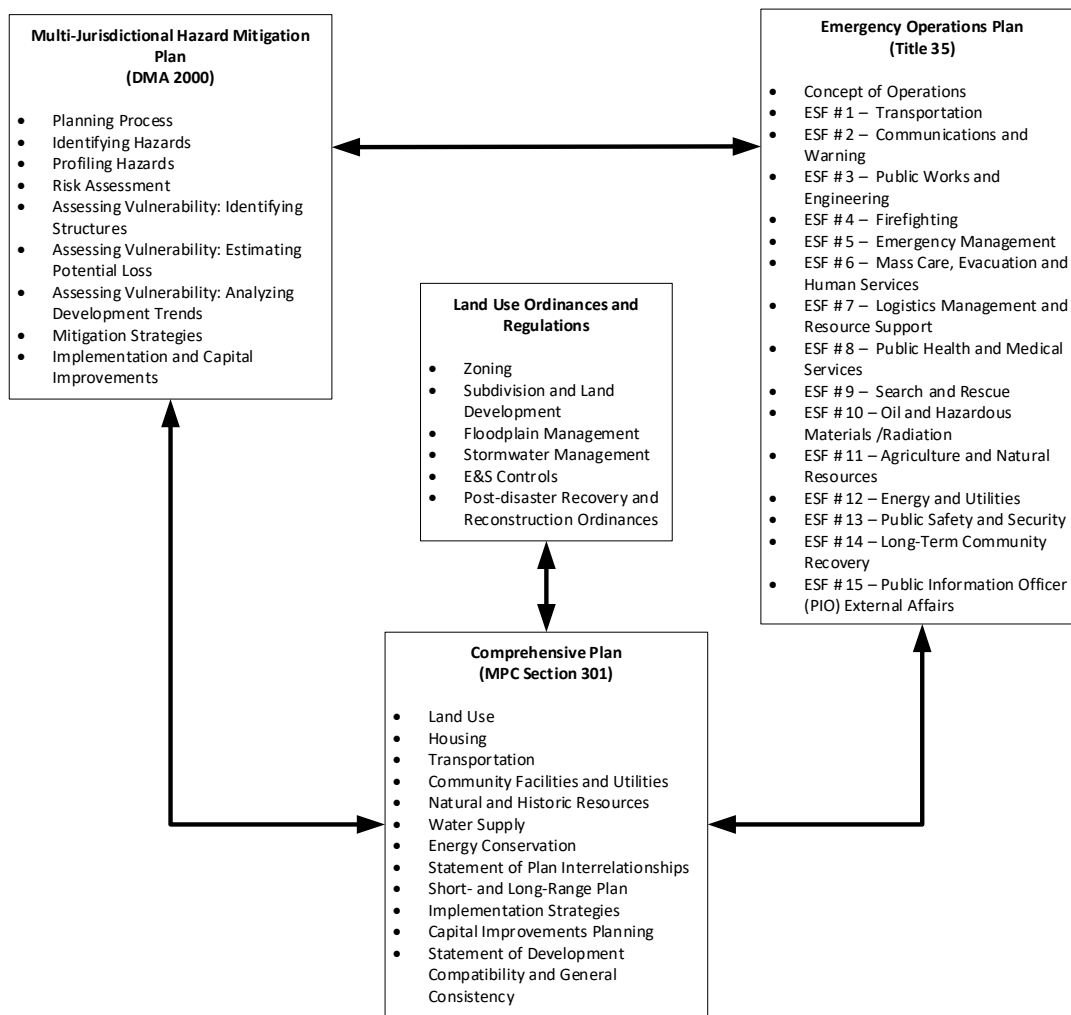
- American Red Cross

Watershed Associations

- Brandywine Red Clay Alliance
- Chester Ridley Crum Watersheds Association
- Darby Creek Valley Association
- Delaware Riverkeeper Network
- Elk Creek Watershed
- Guardians of the Brandywine
- Green Valleys Association
- Master Water Stewards
- Octoraro Watershed Association
- Valley Creek Restoration Partnership
- Valley Forge Trout Unlimited
- White Clay Watershed Association



Figure 5-1. Plan Interrelationships



Note:
 E&S Erosion and Sedimentation
 MPC Municipal Planning Code

During the plan evaluation process, the Planning Team will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and will include these findings and recommendations in the HMP Progress Report.



SECTION 6 MITIGATION STRATEGY

This section describes the process by which the Chester County Planning Team will reduce or eliminate potential losses from the natural and non-natural hazards identified in Section 4.2 of this Hazard Mitigation Plan (HMP). The mitigation strategy focuses on existing and potential future mitigation actions to alleviate the effects of hazards on Chester County’s population, economy, and general building stock.

This section provides a summary of the 2021 HMP update process, outlines the mitigation goals and objectives set forth in the 2021 HMP update, describes the process for identifying and analyzing mitigation techniques, and provides the mitigation action plan.

6.1 UPDATE PROCESS SUMMARY

The goals listed in the Chester County HMP were first examined through the dispersal of the Mitigation Strategy 5-Year Plan Review Worksheet (Mitigation Review Worksheet). During the 5-year review, Planning Team members were afforded the opportunity to comment on the goals and actions that were listed in the existing HMP.

The general mitigation planning approach used to develop this plan is based on (1) the Federal Emergency Management Agency (FEMA) publication, “Local Mitigation Planning Handbook” (FEMA 2020), and (2) the Pennsylvania Emergency Management Agency (PEMA) 2020 Hazard Mitigation Planning Standard Operating Guide (SOG) (PEMA 2020). Specific elements employed in this HMP are summarized below:

- 1. Review of Existing Mitigation Plan Goals, Objectives, and Mitigation Action Plan:** Existing mitigation goals and the Chester County 2015 HMP mitigation actions were first examined at the Kickoff Meeting and revisited during the Mitigation Solutions Workshop. All these meetings were open to members of the Planning Team and stakeholders. The Steering Committee thoroughly reviewed and updated the mitigation goals utilizing the latest information gathered through the hazard profiles, vulnerability assessments, and the risk assessment; the mitigation goals were also compared to the Commonwealth HMP goals and objectives. The updated goals and new objectives were then presented at the Mitigation Solutions Workshop and Mitigation Strategy Review Meeting for final review and approval. Throughout the planning process, plan participants continued to review and provide progress updates on mitigation actions described in the 2015 HMP.
- 2. Develop and Update Mitigation Strategies:** Mitigation actions were identified based on the risk assessment, mitigation goals and objectives, existing policies, and input from the Planning Team and planning partners.
- 3. Mitigation Strategy Prioritization and Implementation:** The potential mitigation actions were qualitatively evaluated and are described in more detail in Section 6.4 of this HMP. Mitigation actions were prioritized into three categories: high, medium, and low. High-priority and medium-priority mitigation actions are recommended for implementation before low-priority actions; however, based on county and municipal-specific needs, cost estimation, and available funding, some low-priority mitigation actions may be addressed first.
- 4. Document the Mitigation Planning Process:** The entire mitigation planning process is documented throughout this HMP, particularly in Section 3.

This section summarizes past mitigation goals and past mitigation action status and provides an update of mitigation strategies and additional past mitigation accomplishments.



6.1.1 Review of the Past Mitigation Goals

The mitigation goals identified in the 2015 HMP are listed below:

- **Goal 1:** Reduce the risk to public safety and public health
- **Goal 2:** Reduce personal and property disaster losses
- **Goal 3:** Increase disaster resilience of public and private infrastructure
- **Goal 4:** Ensure that new and replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards
- **Goal 5:** Identify, encourage, and implement cost-effective hazard mitigation measures
- **Goal 6:** Raise awareness of and encourage participation in hazard mitigation within the community

The 2015 HMP mitigation goals were reviewed at the Planning Team Kickoff Meeting conducted on March 13, 2020. Table 6-1 shows the results of the Steering Committee and Planning Team review of the 2015 goals.



Table 6-1. Steering and Planning Team Evaluation of 2015 HMP Goals

2015 Chester County Hazard Mitigation Plan Goals and Objectives		Evaluation
Goal 1	Reduce the risk to public safety and public health	Update to: “Prevent injury/death, physical damage, and other impacts from hazards in Chester County.”
No objectives identified		Add Objective 1.1 “Enhance regulations for addressing development in hazard-prone areas.”
		Add Objective 1.2 “Upgrade infrastructure to reduce the likelihood of hazards from impacting Chester County.”
		Add Objective 1.3 “Support government agencies and non-governmental organizations to provide aid to vulnerable populations before, during and after a hazard.”
Goal 2	Reduce personal and property disaster losses	Update to: “Protect the citizens of Chester County as well as public and private property from the impacts of natural and human-caused hazards.”
No objectives identified		Add Objective 2.1 “Protect existing structures, including critical facilities and culturally or historically significant assets, from damage that can be caused by hazards.”
		Add Objective 2.2 “Acquire, relocate, elevate, and/or retrofit existing structures, including repetitive loss properties, located in hazard areas.”
		Add Objective 2.3 “Improve existing stormwater management systems to reduce flooding.”
		Add Objective 2.4 “Provide resources that encourage regular inspection and maintenance of existing stormwater facilities to reduce flooding.”
		Add Objective 2.5 “Assist with updating local stormwater management standards to reduce flooding.”
		Add Objective 2.6 “Encourage homeowners, renters, and businesses to insure their properties against all hazards, including flood coverage under the National Flood Insurance Program (NFIP).”
Goal 3	Increase disaster resilience of public and private infrastructure	Remove. Incorporate into Goal 1. Make Goal 3 “To protect and restore existing natural resources including wetlands, floodplains, and riparian buffers.”
No objectives identified		Add Objective 3.1 “Lessen impacts on natural resources and open space from natural and human-caused hazards by promoting sustainable land use and water resources management practices.”
		Add Objective 3.2 “Provide appropriate safeguards for the preservation of the quality of water resources, stream corridors, watershed areas, and floodplains.”



2015 Chester County Hazard Mitigation Plan Goals and Objectives		Evaluation
Goal 4	Ensure that new and replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	Remove. Incorporate goal into Objective 4.3. New Goal 4 “To promote public awareness on the potential impacts of natural and non-natural hazards, and actions to reduce those impacts.”
No objectives identified		Add Objective 4.1 “Develop public education and outreach programs on hazards and hazard mitigation.”
		Add Objective 4.2 “Educate property owners in hazard-risk areas regarding their risks and the precautions they can take.”
		Add Objective 4.3 “Encourage residents to implement hazard mitigation and preparedness measures on their properties.”
		Add Objective 4.4 “Encourage local participation in the Community Rating System (CRS) Program.”
		Add Objective 4.5 “Provide outreach and educational opportunities to the community about where to find comprehensive information on hazards.”
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	Remove. Incorporate into Objectives 2.1, 2.2, and 4.3
No objective identified		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	Remove. Incorporate into Objectives 2.6 and 4.5



6.1.2 Past Mitigation Action Status and Update of Mitigation Strategies

In the 2015 HMP, Chester County identified 85 actions and initiatives to support an improved understanding of hazard risk and vulnerability, to enhance mitigation capabilities, and to reduce vulnerability of infrastructure. Progress on the 2015 mitigation actions was evaluated during the 2021 update process.

Various representatives of Chester County on the Steering Committee and Planning Team were provided with a Mitigation Review Worksheet identifying all the county and municipal actions and initiatives from the 2015 HMP. The respondents were asked to indicate the status of each action (“No Progress/Unknown,” “In Progress/Not Yet Complete,” “Continuous,” “Completed,” or “Discontinued”) and provide review comments on each.

Feedback compiled from the completed Mitigation Action Plan Review Worksheets is summarized in Table 6-2. Projects and initiatives identified as “Complete” and “Discontinued” have been removed from this plan update. The actions that the county has identified as “No Progress/Unknown” or “In Progress/Not Yet Complete” have been carried forward in the updated mitigation strategies identified in Table 6-4 (unless otherwise determined by the county to be discontinued). Actions from the 2015 HMP that reflect continuously maintaining capabilities have also been removed. The language in some actions being carried over has been adjusted to reflect changes to county needs and capabilities. Some actions were also merged to reduce redundant efforts on behalf of the county and its municipalities.



Table 6-2. Past Mitigation Action Status

Description	Jurisdiction	Status	Review Comments
AH-1. Catalog critical facilities and infrastructure within the county	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-2. Upgrade and further develop the countywide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Most municipalities stated no progress, but some indicated this is in progress, or a continuous action
AH-3. Adhere to statewide Uniform Construction Code for new construction	Countywide	No Progress/Unknown, Continuous, Completed	<ul style="list-style-type: none"> Some municipalities stated no progress, but some indicated this is in a continuous action, or it has already been completed
AH-4. Provide regular updates to the countywide Mass Care Plan	Countywide	No Progress/Unknown, Continuous, Completed	<ul style="list-style-type: none"> Some municipalities stated no progress, but some indicated this is in a continuous action, or it has already been completed
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but others reported this action is in progress/not yet complete, or continuously implemented
AH-6. Periodically review county response plans and response teams to ensure they meet the needs of the community	Countywide	Continuous/Completed	<ul style="list-style-type: none"> Some municipalities stated that this action is continuous, and others stated it was completed
AH-7. Promote and provide emergency management training opportunities	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-8. Arrange and hold hazard mitigation workshop for county residents	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, in progress/not yet complete, while others stated it is continuously implemented
AH-9. Maintain and foster communications with PEMA and FEMA region III Mitigation Division	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-10. Examine federal funding opportunities at conference, workshop, and following disasters	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-11. Enhance the communications equipment between the county and the municipalities	Countywide	In Progress/Not Yet Complete, Continuous, Completed	<ul style="list-style-type: none"> Municipalities reported that this action is in progress, continuous, and completed
AH-12. Enhance the county website to create a place to consolidate public information related to disaster response and recovery	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated it is continuously implemented
AH-13. Continue infrastructure improvements through community development	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple county departments	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-15. Implement a system to report blocked/closed roads	Countywide	Completed	<ul style="list-style-type: none"> This action has been completed
AH-16. Provide education to the municipalities on resident evacuation processes and needs	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated it is continuously implemented



Description	Jurisdiction	Status	Review Comments
AH-17. Provide education to the municipalities on tracking road closures	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-18. Promote awareness of mental health services and resources throughout all the facilities within the county to include schools, workplaces, and healthcare facilities	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	Countywide	No Progress/Unknown/Continuous	<ul style="list-style-type: none"> Municipalities reported no progress for this action, whereas some municipalities reported it being continuous
AH-20. Provide public information surrounding radon hazard	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
AH-21. Encourage municipalities to require radon testing at the time sale of homes.	Countywide	No Progress/Unknown	<ul style="list-style-type: none"> Municipalities reported no ogress on this action
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control, such as not planting trees under power lines	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
TS-2. Sustain tree management programs around power lines	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated it is continuously implemented
TS-3. Encourage new development planning to include burying of utility cables	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated it is continuously implemented
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
F-2. Educate county resident on the NFIP following flood events	Countywide	No progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated it is continuously implemented
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	Countywide	In Progress/Not Yet Complete	<ul style="list-style-type: none"> Municipalities reported this action was in progress
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but several stated it is in progress or continuously implemented
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps	Countywide	In Progress/Not Yet Complete, Continuous, Completed	<ul style="list-style-type: none"> Municipalities reported this action has been completed, some reposed that it was in progress or continuous
F-6. Follow Commonwealth and county stormwater regulations	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
F-7. Enforce floodplain management ordinances	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
F-8. Implement the Act 167 Plan (Stormwater management)	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
F-9. Maintain integrity and functions of existing regional flood control facilities	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but several stated it is continuously implemented



Description	Jurisdiction	Status	Review Comments
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but several stated it is continuously implemented
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but several stated this action has been completed
F-12. Continue open space preservation actions	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but some stated this action is continuously implemented
F-13. Continue to maintain the stream gauges within the county	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but some stated this action is continuously implemented
F-14. Install stream gauges if an additional area is identified to benefit from one	Countywide	No Progress/Unknown	<ul style="list-style-type: none"> Municipalities reported no progress on this action
F-15. Provide education to the municipalities on flood gauges	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but some stated this action is continuously implemented
F-16. Install roadway gates to close off flood-prone intersections/roads during flood incidents and signage to warn motorists of the closed road	Countywide	No Progress/Unknown	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, and this action has been included in the HMP update
F-17. Study the traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but others stated this action has been completed
F-18. When provided by FEMA, evaluate, and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate.	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, but others stated this action has been completed
F-20. Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.	Countywide	No Progress/Unknown, In Progress/Not Yet Complete	<ul style="list-style-type: none"> Municipalities reported no progress on this action
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows.	Countywide	No Progress/Unknown, In Progress/Not yet Complete, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress, and others reported this project was in progress or has been completed
F-22. As opportunities arise, elevate or acquire properties within flood-prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired.	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but some stated this action is continuously implemented. There are various municipal actions in the HMP update for elevating/acquiring properties
WS-1. Provide public information on utility outages and the need to prepare for storms	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, but some stated this action is continuously implemented
WS-2. Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents	Countywide	In Progress/Not Yet Complete, Completed	<ul style="list-style-type: none"> Municipalities reported this action is in progress or completed
WS-3. Improve storm drains throughout the county to handle snow melt	Countywide	No Progress/Unknown, In Progress/Not Yet Complete	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated his action is in progress
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Many municipalities reported no progress/unknown, but others stated this action has been complete. This action is included in the HMP update



Description	Jurisdiction	Status	Review Comments
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implementation a declaration of a snow emergency	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress whereas others reported this action has been in progress or complete
TOR-1. Enhance the household hazards waste program to reduce post-event hazardous debris	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some reported no progress on this action while others stated it is continuously implemented and considered a capability
TOR-2 Develop a countywide Debris Management Plan	Countywide	No Progress/Unknown, In Progress/Not Yet complete	<ul style="list-style-type: none"> Some municipalities reported no progress whereas others reported this action has been in progress
TOR-3. Provide public information on debris management	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, or progress, while others reported this action is continuously implemented and considered a capability
TOR-4. Retrofit critical public facilities with safe rooms	Countywide	No Progress/Unknown	<ul style="list-style-type: none"> Municipalities reported no progress/unknown for this action
D-1. Provide public information on the effects of droughts on public and private wells	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
D-2. Promote sustainability programs and green practices throughout the county	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action was in progress or continuous
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	Countywide	No Progress/Unknown, Continuous, Completed	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability, and other municipalities reported it being complete
PG-1. Encourage security check of bags/coolers at public gathering	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Several municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
PG-2. Plan for and implement strengthened security at public events	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities did not report progress on this action whereas others stated it has been completed
PG-4. Provide training for public leaders, coaches, and referees on conflict de-escalation	Countywide	No progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is in progress or continuously implemented and considered a capability
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	Countywide	No Progress/Unknown	<ul style="list-style-type: none"> Municipalities did not report progress on this action
PG-6. Purchase temporary mobile cameras to set up for events	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities did not report progress on this action and others stated it was completed
PG-7. Utilize temporary mobile cameras during large events to monitor safety and security	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Most municipalities did not report progress on this action whereas others stated it is continuous
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability



Description	Jurisdiction	Status	Review Comments
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
PG-10. Increase advanced planning through use of the incident action plan process	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> This action is continuously implemented and considered a capability
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events	Countywide	Continuous	<ul style="list-style-type: none"> This action is continuously implemented and considered a capability
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Completed	<ul style="list-style-type: none"> The action has been complete by most municipalities, but for the municipalities that reported no progress/unknown or in progress, it was included in this HMP update
TRF-5. Coordinate utilization of privately owned digital billboards for emergency usages	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is in progress or continuously implemented and considered a capability
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during disaster	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
TRF-7. Provide public education on traffic accident reduction	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is in progress or continuously implemented and considered a capability
TRF-8. Provide public information on the PennDOT color-coded detour routes installed around major routes within the county.	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
TRF-10. Enforce traffic laws	Countywide	Continuous	<ul style="list-style-type: none"> This is continuously implemented and considered a capability
IL-1. Provide private sector education/outreach related to cyber security best practices	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	Countywide	No Progress/Unknown, Completed	<ul style="list-style-type: none"> Some municipalities reported this action has no progress, whereas others said it has already been completed
IL-3. Purchase backup generators for critical infrastructure/key resources	Countywide	No Progress/Unknown, Not Yet Complete, Completed	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown or in progress, whereas others reported this action has been completed



Description	Jurisdiction	Status	Review Comments
IL-4. Plan for replenishment fuel for generators	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is continuously implemented and considered a capability
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all the critical facilities surrounding their site	Countywide	No Progress/Unknown, In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported no progress/unknown, others reported this action is in progress or it is continuously implemented and considered a capability
IL-6. Continue to engage the private sector to become involved in emergency preparedness	Countywide	In Progress/Not Yet Complete, Continuous	<ul style="list-style-type: none"> Some municipalities reported this action is in progress, whereas others stated it is continuously implemented and considered a capability
IL-7. Continue to provide the county HazMat team with tours of large SARA facilities within the county to maintain familiarization of facility layouts	Countywide	No Progress/Unknown, Continuous	<ul style="list-style-type: none"> Some municipalities reported this action has no progress, others stated it has been continuously implemented and considered a capability



6.1.3 Additional Past Mitigation Accomplishments

Chester County and its municipalities have performed ongoing maintenance projects to reduce the impacts of natural hazards. The county has not identified specific mitigation projects or activities that have been completed that were not identified in the previous mitigation strategy in the 2015 HMP.

6.2 MITIGATION GOALS AND OBJECTIVES

This section describes the mitigation goals and objectives set forth in the 2021 HMP update.

6.2.1 2021 Mitigation Goals

After reviewing the mitigation goals set forth in 2015 HMP to determine their continuing applicability to the county's mitigation needs, the Steering Committee decided to update them. The updated goals were distributed to the Planning Team at the Mitigation Solutions Workshop, wherein the Planning Team reviewed and approved the updated goals for the 2021 HMP. The 2021 HMP goals for Chester County are in line with State mitigation goals, embody the overarching needs and concerns of the county and participating municipalities, and address both natural and non-natural hazard risk reduction.

The 2021 County HMP goals are listed below:

1. **Goal 1:** Prevent injury/death, physical damage, and other impacts from hazards in Chester County.
2. **Goal 2:** Protect the citizens of Chester County as well as public and private property from the impacts of natural and human-caused hazards.
3. **Goal 3:** Protect and restore existing natural resources, including wetlands, floodplains, and riparian buffers.
4. **Goal 4:** Promote public awareness on the potential impacts of natural and non-natural hazards, and actions to reduce those impacts.

6.2.2 2021 Mitigation Objectives

The goals listed above were used to develop relevant objectives. The objectives address the results of the vulnerability assessment in more specific terms and reflect the possible effects that can be mitigated for the identified hazards, as well as identifying existing limitations in available data and information. No objectives were created for the 2015 HMP. The Steering Committee created objectives based on the 2021 goals and these were presented to the Planning Team and finalized at the December 2020 Mitigation Solutions Workshop. Objectives related to each of the goals are listed below, and Table 6-1 summarizes the evaluation of all goals from the 2015 HMP.

Goal 1: Prevent injury/death, physical damage, and other impacts from hazards in Chester County.

- Objective 1.1 Enhance regulations for addressing development in hazard-prone areas.
- Objective 1.2 Upgrade infrastructure to reduce the likelihood of hazards from impacting Chester County.
- Objective 1.3 Support government agencies and non-governmental organizations to provide aid to vulnerable populations before, during, and after a hazard.

Goal 2: Protect the citizens of Chester County as well as public and private property from the impacts of natural and human-caused hazards.

- Objective 2.1 Protect existing structures, including critical facilities and culturally or historically significant assets, from damage that can be caused by hazards.



- Objective 2.2 Acquire, relocate, elevate, and/or retrofit existing structures, including repetitive loss properties, located in hazard areas.
- Objective 2.3 Improve existing stormwater management systems to reduce flooding.
- Objective 2.4 Provide resources that encourage regular inspection and maintenance of existing stormwater facilities to reduce flooding.
- Objective 2.5 Assist with updating local stormwater management standards to reduce flooding.
- Objective 2.6 Encourage homeowners, renters, and businesses to insure their properties against all hazards, including purchasing flood coverage under the National Flood Insurance Program (NFIP).

Goal 3: To protect and restore existing natural resources including wetlands, floodplains, and riparian buffers.

- Objective 3.1 Lessen impacts on natural resources and open space from natural and human-caused hazards by promoting sustainable land use and water resources management practices.
- Objective 3.2 Provide appropriate safeguards for the preservation of the quality of water resources, stream corridors, watershed areas, and floodplains.

Goal 4: To promote public awareness on the potential impacts of natural and non-natural hazards, and actions to reduce those impacts.

- Objective 4.1 Develop public education and outreach programs on hazards and hazard mitigation.
- Objective 4.2 Educate property owners in hazard-risk areas regarding their risks and the precautions they can take.
- Objective 4.3 Encourage residents to implement hazard mitigation and preparedness measures on their properties.
- Objective 4.4 Encourage local participation in the Community Rating System (CRS) Program.
- Objective 4.5 Provide outreach and educational opportunities to the community about where to find comprehensive information on hazards.

6.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

Concerted efforts were made to ensure that the county and its municipalities developed updated mitigation strategies. Updated strategies included activities and initiatives covering the range of mitigation action types described in the recent FEMA planning guidance, “Local Mitigation Planning Handbook” (FEMA 2020). Mitigation action types listed in the FEMA guidance include the following:

1. **Local Plans and Regulations (LPR):** These actions include government authorities, policies, or codes that influence the way land is being developed and buildings are being constructed.
2. **Structure and Infrastructure Projects (SIP):** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. These project types could apply to public or private structures as well as critical facilities and infrastructure. These actions also involve projects to construct manmade structures to reduce the impact of hazards.
3. **Natural Systems Protection (NSP):** These include actions that minimize damage and losses and preserve or restore the functions of natural systems.



- 4. **Education and Awareness Programs (EAP):** These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as the National Flood Insurance Program (NFIP) and Community Rating System (CRS), StormReady (National Oceanic and Atmospheric Administration [NOAA]), and Firewise (National Fire Protection Association [NFPA]) Communities (FEMA 2020).

The participants of the Mitigation Strategy Workshop and the Planning Team identified actions that relate to the categories listed above. Table 6-3 identifies which mitigation action types are applicable for the hazards included in the 2021 HMP. In some cases, the mitigation techniques identified for a particular hazard reflect ongoing mitigation capabilities, not specific projects included in the updated HMP.

Table 6-3. Mitigation Technique Matrix

Hazard	Local Plans and Regulations	Structure and Infrastructure Projects	Natural Systems Protection	Education and Awareness Programs
Dam Failure	✓	✓		✓
Drought and Water Supply Deficiencies		✓		✓
Earthquake		✓		✓
Environmental Hazard Hazardous Materials Release	✓	✓		✓
Environmental Hazard Gas and Liquid Pipelines	✓	✓		✓
Flood, Flash Flood, and Ice Jam	✓	✓	✓	✓
Hurricane, Tropical Storm		✓		✓
Invasive Species		✓	✓	✓
Nuclear Incident	✓	✓		✓
Opioid Addiction Response		✓		✓
Pandemic and Infectious Disease		✓		✓
Radon Exposure		✓		✓
Structural Fires		✓		✓
Terrorism		✓		✓
Tornado, Windstorm		✓		✓
Transportation Accidents	✓	✓		✓
Utility Interruption		✓		✓
Winter Storm	✓	✓		✓

6.4 MITIGATION ACTION PLAN

Representatives from the county and all participating municipalities selected mitigation strategies and initiatives to pursue until the next plan update. The updated action list also includes some actions identified during the 2015 HMP update that are still relevant or in progress. This section describes 2021 mitigation initiatives, mitigation strategy prioritization and implementation, and prioritization of mitigation actions.



6.4.1 2021 Mitigation Initiatives

Table 6-4 summarizes the updated mitigation strategies identified by the county and all municipalities, including the following information:

- Mitigation actions for individual and multiple hazards
- Mitigation action type
- Department or agency primarily responsible for project initiation and/or implementation
- Estimated cost for the mitigation action and identification of known or potential sources of funding
- Implementation schedule
- Implementation priority

The updated mitigation actions were documented using the Mitigation Action Worksheet distributed at the Mitigation Solution Workshop. Appendix G includes a blank version of the Mitigation Action Worksheet, and Appendix H includes copies of the completed worksheets. Specific mitigation actions were identified to prevent future losses; however, current funding is not identified for all these actions at present. Potential funding sources (Section 5) are indicated to support future implementation. The county and municipalities have limited resources to take on new responsibilities or projects. The implementation of these mitigation actions is dependent on the approval of the local elected governing body and the ability of the jurisdiction to obtain funding from local or outside sources.

The Planning Team prioritized proposed mitigation actions during the Mitigation Action Worksheet documentation process. In general, mitigation actions ranked as highest priorities should be addressed first within each jurisdiction, depending upon funding. However, medium- or low-priority mitigation actions should be considered for implementation as funding becomes available. Therefore, the ranking levels should be considered as a preliminary ranking, which will evolve based on prevailing priorities and discretion of local governments, the public, PEMA, and FEMA as the plan update is implemented.



Table 6-4. Hazard Mitigation Strategy

Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
County-Led (Multiple Municipalities)												
ChesterC-1	As opportunities arise, elevate, or acquire properties within flood-prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	Existing	Flood, Flash Flood, and Ice Jams	1,2	Municipalities		Medium	Low	HMGP	Short	Low	SIP
ChesterC-2	Coordinate utilization of privately-owned digital billboards for emergency usages	Existing	Transportation Accidents	2	DES, Planning Department		Medium	Medium	Operating Budget	Long	Medium	SIP
ChesterC-3	Create a website to assist landowners and municipalities to navigate FEMA resources	New	All Hazards	4	DES		Medium	Low	Operating Budget	Short	Medium	EAP
ChesterC-4	Develop a countywide Debris Management Plan	New	Tornado and Windstorms	2	DES, Health Department		Medium	Low	Operating Budget	Short	Medium	LPR
ChesterC-5	Develop a plan to stagger traffic and implement delays/early releases for schools, government, and private sector during a disaster	Existing	Transportation Accidents	2	DES, Planning Department		Medium	Low	Operating Budget	Long	Medium	LPR
ChesterC-6	Develop an outreach and awareness program and provide to municipalities, where residents and potential homeowners could access to identify any risks they might have to address	New	All Hazards	2,4	DES		High	Low	Operating Budget	Short	High	EAP
ChesterC-7	Develop and implement a model natural conservation ordinance for municipal adoption	Existing	Flood Flash Flood, and Ice Jams	3	Planning Department, Municipalities		Medium	Low	Operating Budget	Short	Medium	NSP
ChesterC-8	Educate county residents on the NFIP following flood events	Existing	Flood, Flash Flood, and Ice Jams	2,4	DES CCWRA		Medium	Low	Staff Time	Ongoing	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ChesterC-9	Educate the public on all the hazards they face	Existing	All Hazards	2,4	DES		Medium	Low	Staff Time, Operating Budget	Short	Medium	EAP
ChesterC-10	Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	Existing	Flood, Flash Flood, and Ice Jam	2,4	Municipal FPA		Medium	Low	Operating Budget	Short	Low	EAP
ChesterC-11	Encourage municipalities to adopt an ordinance outlining the process to implement a snow emergency declaration	Existing	Winter Storms	2,4	Municipalities		Medium	Low	Municipal Budgets	Short	Medium	LPR
ChesterC-12	Encourage municipalities to require radon testing at the time sale of homes	Existing	Radon Exposure	2,4	DES		Medium	Low	Staff Time, Operating Budget	Short	Medium	EAP
ChesterC-13	Encourage new development planning to include burying of utility cables	Existing	Utility Interruption	2	Municipalities, Planning Department		Medium	Low	Staff Time, Operating Budget	Ongoing	Medium	SIP
ChesterC-14	Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	Existing	Flood, Flash Flood, and Ice Jams	2	PennDOT, Municipalities, DES, CCWRA, Planning Department		High	High	Operating Budget	Ongoing	High	SIP
ChesterC-15	Enhance the household hazard waste program to reduce post-event hazardous debris	Existing	Environmental Hazards Hazardous Material Releases, Tornado and Windstorms	2	DES, Health Department, Solid Waste Authority		Low	Low	Operating Budget	Short	Low	EAP
ChesterC-16	Ensure that the county has a COOP/COG Plan and procedures in place for off-site hazmat releases that can affect the buildings.	Existing	Environmental Hazard Hazardous Material Releases	2	DES	All departments	High	Medium	SEPA RTF Funding	Short	High	LPR
ChesterC-17	Ensure that the municipal EMAs have COOP/COG plans	N/A	All Hazards	1	DES	All departments	High	Medium	SEPA RTF Funding	Short	High	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ChesterC-18	Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents	Existing	Winter Storms	2,4	DES		Medium	Low	Staff Time, Operating Budget, HMGP	Ongoing	Medium	SIP
ChesterC-19	Improve storm drains throughout the county to handle snow melt	Existing	Flood, Flash Flood, and Ice Jams, Winter Storms	2	Municipalities, PennDOT		Medium	Low	Municipal Budgets, State Budgets, HMGP	Long	Medium	SIP
ChesterC-20	Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	Existing	Flood, Flash Flood, and Ice Jams	1,2,4	Planning Department, DES, CCWRA		Medium	Low	Staff Time, County funding, Operating Budget	Ongoing	Medium	EAP
ChesterC-21	Increase cell coverage and telecommunications bandwidth in areas with poor coverage	Existing	Utility Interruption	4	DES		High	High	FEMA HMGP, BRIC, PA DCED, Operating Budget	Short	High	SIP
ChesterC-22	Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	Existing	All hazards	2	DES	Municipalities, Procurement	High	Low	Staff Time, Operating Budget	Ongoing	High	LPR
ChesterC-23	Install back-up power sources for traffic signals (generator, battery, solar)	Existing	Transportation Accidents	2	DES, Municipalities, PennDOT		Medium	High	Agency Budgets, HMGP	Short	Medium	SIP
ChesterC-24	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	Existing	Flood, Flash Flood, and Ice Jams	2	DES, Municipalities		High	Medium	Operating Budget, HMGP	Short	High	SIP
ChesterC-25	Investigate the interaction of public agencies and camera	Existing	Terrorist Attacks	1,2	Sheriff's Office, DA's Office, DES		Medium	Low	Operating Budget	Long	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	data from private companies/citizens											
ChesterC-26	Plan for replenishment fuel for generators	Existing	Utility Interruption	2	DES, Private Sector		Medium	Low	Operating Budget	Short	Medium	LPR
ChesterC-27	Plant bushes/other vegetation to stop drifting snow in known problem areas	Existing	Winter Storms	2	Municipalities		Low	Low	Municipal Budgets	Short	Low	SIP
ChesterC-28	Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.	New	Flood, Flash Flood, and Ice Jam	2,3,4	Planning Department, DES, CCWRA		Medium	Low	Operating Budget	Short	Medium	EAP
ChesterC-29	Provide education to the municipalities on flood gauges.	New	Flood, Flash Flood, and Ice Jam	2,3	DES		Medium	Low	Operating Budget	Short	High	EAP
ChesterC-30	Provide education to the municipalities on resident evacuation processes and need	Existing	All Hazards	2,4	DES		Medium	Low	Staff Time, Operating Budget	Short	Medium	EAP
ChesterC-31	Provide public education on traffic accident reduction	Existing	Transportation Accidents	2	DES, Planning Department		Low	Low	Staff Time, County Budget	Ongoing	Low	EAP
ChesterC-32	Provide public information on debris management	New	Tornado and Windstorms	1,4	DES, Health Department, Planning Department		Medium	Low	Operating Budget	Short	Medium	EAP
ChesterC-33	Purchase backup generators for critical infrastructure/ key resources	Existing	Utility Interruption	2	DES, Private Sector		Medium	Medium	Agency Budgets, HMGP	Short	Medium	SIP
ChesterC-34	Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	Existing	Flood, Flash Flood, and Ice Jams	1,2	Municipalities	Planning Department, CCWRA, Conservation District, DES	Medium	Low	HMGP, CDBG	Ongoing	Medium	SIP
ChesterC-35	Retrofit critical public facilities with safe rooms	Existing	Tornado and Windstorms	1,2	DES		Low	High	HMGP, Operating Budget	Long	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ChesterC-36	Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	Existing	Flood, Flash Flood, and Ice Jam, Transportation Accident	1,2	DES, Planning Department		Medium	Low	HMGP, Operating Budget	Long	Medium	SIP
ChesterC-37	Sustain tree management programs around power lines	Existing	Utility Interruption	2	Municipalities, private sector		High	Medium	Staff Time, Agency Budget	Ongoing	High	SIP
ChesterC-38	The county and all municipalities will work with their major businesses to ensure they have continuity plans in place.	Existing	Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines	2	DES	All departments	High	Medium	Operating Budget	Short	High	LPR
ChesterC-39	The county and all municipalities with a dam will work with dam operators to ensure they are protected to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2	DPW	Dam Operators	High	High	Operating Budget	Long	Medium	SIP
ChesterC-40	The county and municipalities will work with the higher education facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	Existing	Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident	1	County DES	Municipal EMC	High	High	Operating Budget	Short	Medium	LPR
ChesterC-41	The county and municipalities will work with the intermediate care facility operators to discuss the hazards they face and	Existing	Environmental Hazard Hazardous Material Releases,	1	County DES	Municipal EMC	High	High	Operating Budget	Short	Medium	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	ensure their emergency plans address those hazards.		Environmental Hazard Gas and Liquid Pipelines									
ChesterC-42	The county and municipalities will work with the long-term care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	Existing	Dam Failure, Environmental Hazard Hazardous Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident	1	County DES	FPA, Municipal EMC	High	High	Operating Budget	Short	Medium	LPR
ChesterC-43	The county and municipalities will work with the senior living facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	Existing	Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident	1	County DES	Municipal EMC	High	High	Operating Budget	Short	Medium	LPR
ChesterC-44	The county will assess their bridges to determine what measures can be taken to protect them to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	DES	Municipal EMCs, PEMA	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
ChesterC-45	The county will work with all municipalities that have a child care facility exposed to any of the hazards to work with the child care facility operators to discuss hazards they face and ensure their emergency plans address those hazards	Existing	Dam Failure, Environmental Hazards-Hazmat Release, Environmental Hazards-Pipeline, Flood, Flash	1	County DES	FPA, Municipal EMC	High	High	Operating Budget	Short	Medium	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
			Flood, and Ice Jams, Nuclear Incident									
ChesterC-46	Update countywide Model Stormwater Ordinance	Existing	Flood, Flash Flood, and Ice Jam	1	DES		High	Medium	Operating Budget	Short	Low	LPR
ChesterC-47	When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	Existing	Flood, Flash Flood, and Ice Jams	2,3, 4	DES, CCWRA		Medium	Low	Operating Budget	Short	Medium	EAP
ChesterC-48	Work with district courts to ensure they have plans in place for off-site hazmat releases that can affect the courts.	Existing	Environmental Hazard Hazardous Material Releases	2	DES	District courts	High	Low	Operating Budget, Act 165 funds	Short	High	LPR
ChesterC-49	Work with hazmat facilities to inform them of the hazards they face and ensure emergency plans are current.	Existing	Environmental Hazard Hazardous Material Releases	1,2	DES	LEPC	High	Low	Operating Budget, Act 165 funds	Short	High	EAP
ChesterC-50	Work with hospitals to ensure they have plans in place for off-site hazmat releases that can affect hospitals.	Existing	Environmental Hazard Hazardous Material Releases	2	DES	Hospitals	High	Low	Operating Budget, Act 165 funds	Short	High	LPR
ChesterC-51	Work with schools and school districts to inform them of the hazards they face and ensure emergency plans are current.	Existing	Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines	1	County DES	Municipal EMC	High	High	Operating Budget, Act 165 funds	Short	Medium	LPR
ChesterC-52	Work with the municipalities to develop a map of the stormwater	New	Flood, Flash Flood, and Ice Jams	2,4	CCWRA, Planning Department,		Medium	Low	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	system, including intakes and outflows				DES, Municipalities							
ChesterC-53	Work with the railroad industry to address safety concerns and aging rail infrastructure	Existing	Transportation Accidents	1	DES, Planning Department		Medium	Low	Operating Budget, PHMSA	Short	Medium	SIP
ChesterC-54	Work with the USPS on options for protecting the post offices from flooding and possible inundation from dam failure.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2	DPW	USPS; Municipal FPA	High	Medium	Operating Budget, Act 165 funds	Short	High	SIP
ChesterC-55	Work with Verizon to protect the facilities from flood or dam failure.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2, 4	DES	DPW, Municipal EMC, PEMA	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
ChesterC-56	Educate the public about resources available to combat the opioid abuse/addiction.	N/A	Opioid Addiction Response	1, 4	Health Department	DES	Medium	Low	Operating Budget	Short	Medium	EAP
ChesterC-57	Improve telecommunications infrastructure, including accessibility of high-speed Internet connectivity, throughout the county	Existing	Pandemic and Infectious Disease; Utility Interruption	1	Chester County Planning Commission		High	High	PA DCED; Operating Budget	Long	High	SIP
Atglen Borough												
AtglenB-1	The municipal FPA will work with the Atglen Borough Sewer Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2, 4	FPA	N/A	High	Medium	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
AtglenB-2	Work with the property owner to determine what flood protection measures can be taken to protect the structure to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	N/A	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
Avondale Borough												
AvondaleB-1	The municipal FPA will work with the Avondale Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	N/A	High	Medium	Operating Budget	Short	Medium	EAP
Birmingham Township												
BirminghamT-1	Build an access road to Masters Way to Webb Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
BirminghamT-2	Work with PennDOT to reengineer intersection at Street Road (PA 926) bridge over Brandywine Creek	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	PennDOT, Municipal Budget	Long		SIP
BirminghamT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Brinton's Mill, Lenape Bridge, and Painter, Joseph, Farm	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	FPA		High	Medium	Operating Budget	Short		SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Caln Township												
CalnT-1	Acquire/Elevate the building located on 135 Seltzer Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA		High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
CalnT-2	Caln Township has major businesses that are vulnerable to dam failure and will work with management to protect the buildings.	Existing	Dam Failure	1,2,4	EMC	Major businesses	Medium	Low	Operating Budget	Short	Medium	LPR
CalnT-3	Protect the Caln Radio Tower to the 0.2% annual chance flood level and from a potential dam failure.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	FPA		High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
CalnT-4	Work with Downingtown Middle School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC	Downingtown Middle School	High	Medium	Operating Budget	Short	Medium	SIP
Charlestown Township												
CharlestownT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pennsylvania Railroad Bridge (No.205), Pickering Dam	Existing	Dam Failure	1,2,4	EMC	PHMC	High	Medium	FEMA HMGP, PDM, FMA; PA DCED FMP; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Coatesville City												
CoatesvilleC-1	Emergency Alert System - the City of Coatesville will implement an emergency alert system that will inform residents in the event of an emergency in an effort to improve public safety.	Existing	All Hazards	4	City of Coatesville Office of Emergency Management	Coatesville Fire & Police Departments	Medium	Medium	Capital Improvement Budget; Operating Budget	Short	High	EAP
CoatesvilleC-2	Install gates to be closed during flood incidents and signage at 11th Avenue and railroad underpass	Existing	Flood, Flash Flood, and Ice Jam	1,2	City		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
CoatesvilleC-3	West End Fire Station Generator - obtain a backup generator in order ensure that emergency operations are maintained during a power outage.	Existing	Tornado, Windstorm; Utility Interruption; Winter Storm	2	City of Coatesville Office of Emergency Management	West End Fire Company	High	Medium	FEMA HMGP, BRIC; Capital Improvement Budget; Operating Budget	Short	High	SIP
CoatesvilleC-4	Protect ArcelorMital Emergency Services to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2, 4	FPA	PHMC	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
CoatesvilleC-5	Gibbons Run Culvert Flooding and Structural Stability – evaluate the culverts and repair, rehabilitate, or replace them as necessary.	Existing	Flood, Flash Flood, and Ice Jam	2	City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED FMP, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	Long	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
CoatesvilleC-6	The municipal FPA will work with the Martin-Brower facility owner/operator to protect the facility to the 0.2% annual chance flood level and dam failure.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	FPA	PHMC	High	Medium	Operating Budget	Short	Medium	EAP
CoatesvilleC-7	Upgrade City Hall Command Center - these upgrades include upgrades to the existing generator to allow for increased functionality of City Hall, the Police Station and the Emergency Command Center during a power outage and upgrades to the communication utilities to permit full functionality during an emergency.	Existing	Tornado, Windstorm; Utility Interruption; Winter Storm	2	City Office of Emergency Management		High	High	FEMA BRIC, HMGP; Capital Improvement Budget; Operating Budget;	Short	High	SIP
CoatesvilleC-8	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: High Bridge, Huston, Abram, House & Carriage House, Lukens Main Office Building	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	FPA	PHMC	High	Medium	Operating Budget	Short	Medium	SIP
CoatesvilleC-9	Amtrak Keystone Corridor Underpass Flooding – evaluate and improve drainage and eroding areas along the corridor.	Existing	Flood, Flash Flood, and Ice Jams	1, 2, 4	City of Coatesville Public Works Department	Amtrak, Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED FMP, Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating	Long	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Budget; Chester County DCD (CDBG, CRP)			
CoatesvilleC-10	S. 5th Avenue Stormwater Improvements	Existing	Flood, Flash Flood, and Ice Jams	1, 2	City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED FMP, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	Long	High	SIP
CoatesvilleC-11	63 S. 5th Ave. Property Protection - protect the existing grocery store on the corner of Olive St. and S 5th Ave.	Existing	Flood, Flash Flood, and Ice Jams		City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP	Short	High	SIP
CoatesvilleC-12	Pre-Plan Emergency Access Routes	Existing	Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism		City of Coatesville Public Works Department	Chester County DES	Medium	Low	Operating Budget	Short	High	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
CoatesvilleC-13	Ash Park Stormwater Improvements - improve infiltration and mitigate floodwaters that pose a threat for travelers during/after storm events.	N/A	Flood, Flash Flood, and Ice Jams		City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED FMP, Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	Long	High	SIP
CoatesvilleC-14	Downtown Stormwater Improvements - upgrade Coatesville's existing stormwater infrastructure in the downtown business district	Existing	Flood, Flash Flood, and Ice Jams		City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	Long	High	SIP
CoatesvilleC-15	Millview Basin - restore proper stormwater detention basin function with added water quality improvements	Existing	Flood, Flash Flood, and Ice Jams		City of Coatesville Public Works Department	Valley Township, Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	FEMA BRIC, HMGP; PA DCED FMP, H2O PA, WRPP; Capital Improvement Budget; Operating Budget;	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Chester County DCD (CDBG, CRP)			
CoatesvilleC-16	Public Information Programs - develop education packages, classes, meetings, programs, etc. with the goal of improving public knowledge of potential hazards within the City and how these hazards are dealt with.	Existing	All hazards		City of Coatesville Office of Emergency Management	Coatesville City Council	High	Medium	Operating Budget	Short	Medium	EAP
CoatesvilleC-17	Create a Capital Improvements Plan	N/A	Flood, Flash Flood, and Ice Jams		City of Coatesville Public Works Department		Medium	Medium	Operating Budget, Chester County Vision Partnership Program; PADCED Municipal Assistance Program	Short	High	LPR
CoatesvilleC-18	Provide backup power at the City's traffic signals, including developing a plan for implementation and refueling.	N/A	Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism; Transportation Accident; Utility		City of Coatesville Public Works Department	Chester County Conservation District, Pennsylvania Department of Environmental Protection	Medium	Medium	Capital Improvement Budget; Operating Budget; PADOT ARLE; PADOT Green Light Go; PADCED Municipal Assistance Program	Short	Medium	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
			Interruption; Winter Storms									
CoatesvilleC-19	Route 82 Slope Stability - ensure the stability of the slopes along the eastern side of Route 82 in order to maintain unimpeded direct access into and out of the City.	N/A	Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism; Transportation Accident; Utility Interruption; Winter Storms		City of Coatesville Public Works Department	PennDOT, Valley Township, Chester County Conservation District, Pennsylvania Department of Environmental Protection	High	High	PennDOT; FEMA BRIC, HMGP; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP).	Short	High	SIP
Downingtown Borough												
DowningtownB-1	Determine the specific vulnerability of the Downingtown Borough Building to dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC	Downingtown Borough	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
DowningtownB -2	Downingtown Borough has major businesses that are vulnerable to dam failure and will work with management to protect the buildings	Existing	Dam Failure	1,2,4	EMC	Downingtown Borough	High	Medium	Operating Budget	Short	High	SIP
DowningtownB -3	Protect Alert FC Fire Station from dam failure.	Existing	Dam Failure	1,2,4	EMC	Fire Station	High	Medium	Operating Budget	Short	High	SIP
DowningtownB -4	Protect Downingtown - Jefferson Ave Electrical Substation to the 0.2%	Existing	Flood, Flash Flood, and Ice	1,2,4	EMC		High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	annual chance flood level and from the vulnerability to dam failure.		Jams, Dam Failure									
DowningtwnB-5	Protect Downingtwn Boro PD from potential dam failure.	Existing	Dam Failure	1,2,4	EMC	Police Department	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-6	Protect Minquas Ambulance Fire Station from dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC	Minquas Ambulance Fire Station	High	High	Operating Budget	Short	Medium	SIP
DowningtwnB-7	Protect Minquas FC from potential dam failure.	Existing	Dam Failure	1,2,4	EMC	Minquas FC	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-8	Protect the Downingtwn Municipal Waste from dam failure.	Existing	Dam Failure	1,2,4	EMC	Downingtwn Municipal Waste	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-9	The municipal FPA will work with AT&T Mobility Downingtwn - USID53712 facility owner/operator to protect the facility from its vulnerability to dam failure.	Existing	Dam Failure	1,2,4	EMC	Facility owner/operator	High	Medium	Operating Budget	Short	Medium	EAP
DowningtwnB-10	The Municipal FPA will work with the Downingtwn Municipal Water Authority owner/operator to the 0.2% annual chance flood level and from vulnerability to dam failure.	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	FPA, EMC	Downingtwn Municipal Water Authority owner/operator	High	Medium	Operating Budget	Short	Medium	EAP
DowningtwnB-11	The municipal FPA will work with the Inland Flexo, LLC facility owner/operator to protect the facility from its vulnerability to dam failure.	Existing	Dam Failure	1,2,4	FPA, EMC	Inland Flexo, LLC owner/operator	High	Medium	Operating Budget	Short	Medium	EAP
DowningtwnB-12	The municipal FPA will work with the Johnson Matthey AGT facility owner/operator to protect	Existing	Dam Failure	1,2,4	FPA, EMC	Johnson Matthey AGT facility owner/operator	High	Medium	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	the facility from vulnerability to dam failure.											
DowningtwnB-13	The municipal FPA will work with the Verizon Downingtwn CO owner/operator to protect the facility from vulnerability to dam failure.	Existing	Dam Failure	1,2,4	FPA, EMC	Verizon Downingtwn CO owner/operator	High	Medium	Operating Budget	Short	Medium	EAP
DowningtwnB-14	The municipal FPA will work with the Victory Brewing Company, LLC owner/operator to protect the facility from vulnerability to dam failure.	Existing	Dam Failure	1,2,4	FPA, EMC	Victory Brewing Company, LLC owner/operator	High	Medium	Operating Budget	Short	Medium	EAP
DowningtwnB-15	Work with Beaver Creek Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC, FPA	Beaver Creek Elementary School	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-16	Work with Downingtwn High School West to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	Downingtwn High School West	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-17	Work with East Ward Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	East Ward Elementary School	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-18	Work with Lori Petrie's Pre School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	Preschool	High	Medium	Operating Budget	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
DowningtwnB-19	Work with Regina Luminis Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	Regina Luminis Academy	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-20	Work with SEPTA and Amtrak to protect the station from dam failure	Existing	Dam Failure	1,2,4	EMC, FPA	SEPTA and Amtrak	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-21	Work with St. Joseph School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC, FPA	St. Joseph School	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-22	Work with STEM Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	STEM Academy	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-23	Work with Step by Step Children's House to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	Existing	Dam Failure	1,2,4	EMC, FPA	Step by Step Children's House	High	Medium	Operating Budget	Short	High	SIP
DowningtwnB-24	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect the, to the 0.2% annual chance flood level and vulnerability to dam failure: Downingtwn Log House, Hunt, Roger, and Mill Complex	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
DowningtwnB-25	Work with the United States Marine Recruiting Office to protect the structure from	Existing	Dam Failure	1,2,4	EMC, FPA	Marine Recruiting Offices	High	Medium	Operating Budget	Short	High	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	the vulnerabilities of dam failure.											
East Bradford Township												
EastBradfordT-1	Acquisition/elevation of structure at 414 Cottage Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-2	Acquisition/elevation of structure located at 402 Cottage Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-3	Acquisition/elevation of structure located at 406 Cottage Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-4	Acquisition/elevation of structure located at 418 Cottage Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-5	Acquisition/Elevation of structure located at 502 River Bed Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP,	Long	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
EastBradfordT-6	Acquisition/Elevation of structure located at 530 River Bend Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-7	Acquisition/Elevation of structure located at 550 River Bend Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-8	Acquisition/Elevation of structure located at 558 River Bend Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBradfordT-9	Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Niels Street	Existing	All Hazards	2	Twp./ DPW		High	High	Operating budget	Short	Medium	SIP
EastBradfordT-10	Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
EastBradfordT-11	Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EastBradfordT-12	Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
EastBradfordT-13	Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
EastBradfordT-14	Municipal FPA to work with the Aqua Ingrams Mill Plant facility owner/operator to protect the facility from the vulnerabilities to dam failure.	Existing	Dam Failure	1,2,4	FPA		High	High	Operating Budget	Short	Medium	EAP
EastBradfordT-15	Property protection of structure located at 1010 Valley Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
EastBradfordT-16	Protect East Bradford Electrical Substation from vulnerability to dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
EastBradfordT-17	Protect Good Fellowship Ambulance (Sub-Station) from the vulnerabilities from dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
EastBradfordT-18	The municipal FPA to work with the PECO Bradford Substation facility owner/operator to protect the facility from vulnerabilities to dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA	PECO Bradford Substation facility owner/operator	High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EastBradfordT-19	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cope's Bridge, East Bradford Historic District- HDA, Gibson's Covered Bridge, Hance, Joseph, House & Barn, Hannum, Col. John House, Jefferis Ford Bridge, Paradise Valley Historic District, Strode's Mill, Strode's Mill Historic District, and Taylor-Cope Historic District	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
East Brandywine Township												
EastBrandywineT-1	Acquire/elevate structure at 745 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBrandywineT-2	Acquire/elevate structure at 755 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBrandywineT-3	Acquire/elevate structure at 765 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EastBrandywineT-4	Acquire/elevate structure at 775 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBrandywineT-5	Acquire/elevate structure at 785 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastBrandywineT-6	Beaver Creek Dam Rehabilitation Project	Existing	Dam Failure	1,2,4	CC WRA	USDA Natural Resources Conservation Service	High	High	USDA Natural Resources Conservation Service and Chester County Commissioners	Short	High	SIP
EastBrandywineT-7	Increase size of culvert crossing at 2069 Bondsville Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
EastBrandywineT-8	Install a flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC, FMA, Operating Budget	Short	High	SIP
EastBrandywineT-9	Install generator connection at East Brandywine Baptist Church	Existing	All Hazards	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EastBrandywineT-10	Install generator connection at Hopewell United Methodist Church	Existing	All Hazards	2	Twp./ DPW		High	High	Operating Budget	Short	Medium	SIP
EastBrandywineT-11	Property protection of structure located at 1051 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
EastBrandywineT-12	Property protection of structure located at 1061 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
EastBrandywineT-13	Property protection of structure located at 1081 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
EastBrandywineT-14	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Bridge Mill Farm, Dowlin Farm, and Marshall's Bridge	Existing	Flood, Flash Flood, and Ice Jams, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
East Caln Township												
EastCalnT-1	Determine the specific vulnerability to dam failure and determine appropriate mitigation measures for the	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Downingtown Sewer Authority											
EastCalnT-2	The municipal FPA to work with the D.R.W.P.C.C facility owner/operator to protect the facility from vulnerabilities to flooding.	Existing	Dam Failure	1,2,4	FPA, EMC	DRWPC facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
East Coventry Township												
EastCoventryT-1	Acquisition/elevation of structure located at 285 Linfield Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
EastCoventryT-2	Install emergency alerting systems for East Coventry Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
EastCoventryT-3	Project East Coventry - Linfield Road Electrical Substation from the vulnerabilities of dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
EastCoventryT-4	The municipal FPA to work with Taylor Industries Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	Taylor Industries Inc facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
EastCoventryT-5	Work with the property owner to determine what flood protection measures can be taken to protect it to	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	the 0.2% annual chance flood level and from the vulnerabilities to dam failure.								FMP, Operating Budget			
East Fallowfield Township												
EastFallowfieldT-1	Improve drainage to reduce flooding along Mortonville Road including intersection of Mortonville Road and Sawmill Road	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EastFallowfieldT-2	Improve drainage to reduce flooding on Timacula Road	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EastFallowfieldT-3	Protect East Fallowfield - Spring Dell Road Electrical Substation to the 0.2% annual chance flood event	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Medium	SIP
EastFallowfieldT-4	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Strasburg Rd Bridge, Speakman No.2, and the Gorden Farm	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	Mun. EM, FPA		High	High	Operating Budget	Short	Medium	SIP
East Goshen Township												
EastGoshenT-1	Work with the Goodwin Acres owner to determine what protection measures	Existing	Dam Failure	1,2,4	EMC, FPA	Goodwin Acres owner	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	can be taken to protect them from vulnerabilities to dam failure.											
East Marlborough Township												
EastMarlboroughT-1	Emergency alerting systems for East Marlborough Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
East Pikeland Township												
EastPikelandT-1	Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	Existing	All Hazards	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
EastPikelandT-2	Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	Existing	Drought and Water Supply Deficiencies	1,2	Twp.		Medium	Low	Municipal Budget	Short	Medium	SIP
EastPikelandT-3	Plant bushes/other vegetation to stop drifting snow in known problem areas	Existing	Winter Storms	2	Twp. DPW		Medium	Low	Municipal Budget	Short	Medium	SIP
EastPikelandT-4	Purchase temporary mobile camera to set up for events and use to monitor safety and security	Existing	Terrorism	1	Twp.		Low	Low	Municipal Budget	Short	Low	SIP
EastPikelandT-5	Retrofit critical public facilities with safe rooms	Existing	Terrorism	2	Twp.		Medium	High	FEMA, PEMA	Long	Medium	SIP
EastPikelandT-6	The municipal FPA to work with the Cromby Generating Station facility owner/operator to protect the facility to at least the	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2, 4	EMC, FPA	Cromby Generating Station facility owner/operator	High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	0.2% chance flood level and from vulnerabilities to dam failure.											
EastPikelandT-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and vulnerabilities to dam failure: Bernard Property, Hare's Hill Road Bridge, Hartman, Peter, Residence, Kimberton Historic District, and Rapp's Covered Bridge	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
EastPikelandT-8	Work with the railroad industry to address safety concerns and aging rail infrastructure	Existing	Transportation Accidents	1	Twp.		High	High	FEMA, HMGP, Municipal Budget	Long	Low	SIP
East Vincent Township												
EastVincentT-1	Protect the Shady Lane Water Treatment Plant from dam failure	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
EastVincentT-2	The municipal FPA to work with the Columbia Gas Transmission/Birdsboro Heater facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities of potential dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	Columbia Gas Transmission/ Birdsboro Heater facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
EastVincentT-3	The municipal FPA to work with the Oehlert Bros., Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	Oehlert Bros., Inc facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
EastVincentT-4	The municipal FPA to work with the Shady Lane Plant-	Existing	Dam Failure	1,2,4	EMC, FPA	Shady Lane Plant-	High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Royersford facility owner/operator to protect the facility from the vulnerabilities of dam failure					Royersford facility owner/operator						
EastVincentT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Kennedy Covered Bridge and Parker's Ford	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
East Whiteland Township												
EastWhitelandT-1	Increase stormwater pipe size at Hillbrook Circle	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
EastWhitelandT-2	Install a generator at the Meadowview pump station	Existing	Utility Interruption	2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
EastWhitelandT-3	Install a generator at the pump station on Flat Road	Existing	Utility Interruption	2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
EastWhitelandT-4	Install gates to be closed during flood incidents and signage at Church Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EastWhitelandT-5	Install gates to be closed during flood incidents and signage at Old Morehall Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
EastWhitelandT-6	Work with management of major businesses to protect the buildings to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	2	FPA		High	High	Operating Budget	Short	Medium	SIP
EastWhitelandT-7	Work with the Spring Mill Complex owner to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood event.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Easttown Township												
EasttownT-1	Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed	Existing	Flood, Flash Flood, and Ice Jam	2,3	FPA		High	High	FEMA HMGP, BRIC	Long	Medium	SIP
EasttownT-2	Work with Sugartown Road Bridge owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Elk Township												
ElkT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Glen Hope Covered Bridge, Rudolph &	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Arthur Covered Bridge, and Stephens, Linton Covered Bridge											
Franklin Township												
FranklinT-1	Clear out blocked inlets at 896 between Goodhope Road and Gypsy Hill	Existing	Flood, Flash Flood, and Ice Jam	2,3	Twp.		Medium	Medium	Operating Budget	Short	Low	SIP
FranklinT-2	Divert water on 512 Chesterville Road during heavy rain events	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
FranklinT-3	Improve drainage on North Clay Creek and Churchill Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
FranklinT-4	Improve drainage to reduce flooding at Green Bridge on Strickersville Road and Appleton Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
Honey Brook Borough												
HoneyBrookB-1	Work with PennDOT to improve US-322 corridors to mitigate traffic accidents	Existing	Transportation Accidents	2	Boro.	PennDOT	High	High	PennDOT, Operating Budget	Long	Medium	SIP
Honey Brook Township												
HoneyBrookT-1	The municipal FPA to work with the Honey Brook Borough Authority facility owner/operator to protect	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA, EMC		High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	the facility to at least the 0.2% chance flood level.											
Kennett Square Borough												
KennettSquareB-1	Improve drainage on East South Street between S Walnut and Broad Street to prevent flooding	Existing	Flood, Flash Flood, and Ice Jam	1	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
KennettSquareB-2	Improve drainage on South Street at Lafayette and Grant Way	Existing	Flood, Flash Flood, and Ice Jam	1	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
KennettSquareB-3	Improve drainage on Walnut Street between Birch and East South St	Existing	Flood, Flash Flood, and Ice Jam	1	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
KennettSquareB-4	Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St, west of Union St	Existing	Flood, Flash Flood, and Ice Jam	1	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
KennettSquareB-5	The municipal FPA will work with Comcast Cable-Kennell Square Hubsite owner/operator to protect the facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA, EMC		High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Kennett Township												
KennettT-1	Acquisition/elevation of structure located at 611 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
KennettT-2	Acquisition/elevation of structure located at 903 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
KennettT-3	Acquisition/elevation of structure located at 909 Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
KennettT-4	Assess and determine the best action to prevent East Hillendale Rd from flooding	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Medium	Medium	SIP
KennettT-5	Assess and determine the best action to prevent flooding of Kaolin Rd from stream	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Medium	Medium	SIP
KennettT-6	Assess and determine the best action to prevent flooding of Marshall Bridge a Route 82 South	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.	PennDOT	High	High	FEMA HMGP, BRIC, FMA; PA DCED	Medium	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									FMP, Operating Budget			
KennettT-7	Assess and determine the best action to prevent flooding of the West Hillendale stream from Chandler Mill to Scarlet	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Medium	Medium	SIP
KennettT-8	Assess and determine the best action to prevent further erosion of Bucktoe Road stream banks and prevent flooding of the road	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
KennettT-9	Assess and determine the best action to prevent Rosedale Road stream from overflowing onto the road	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Medium	Medium	SIP
KennettT-10	Assess and determine the best action to prevent the stream on Center Mill Road from overflowing	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Medium	Medium	SIP
KennettT-11	Install gates to be closed during flood incidents and signaled at flood intersections within the township	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
KennettT-12	Install warning signs to be utilized during flood incidents at flood-prone bridges within the township	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC;	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
KennettT-13	The municipal FPA to work with the AT&T SBA Kennett Square facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	EMC, FPA	AT&T SBA Kennett Square facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
KennettT-14	The municipal FPA to work with the Kennett Square Borough Sewage Treatment Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA, EMC	Kennett Square Borough Sewage Treatment Plant facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
KennettT-15	Work with county to improve drainage on Bayard Road	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	Operating Budget	Short	Low	SIP
KennettT-16	Work with the county to improve drainage on Pemberton Road Bridge from Mill Road to Cedar Springs to prevent flooding	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	Operating Budget	Short	Low	SIP
KennettT-17	Work with the county to improve drainage on South Street from Scarlet to Chandler Mill	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	Operating Budget	Short	Low	SIP
London Britain Township												
LondonBritainT-1	Emergency alerting systems for London Britain Township	Existing	All Hazards	4	AGEM, Chester County		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
LondonBritainT-2	Install a snow fence during snow season to prevent snow drifting on South Bank Rd	Existing	Snow Storm	2	Twp. DPW		Medium	Low	Municipal Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LondonBritainT-3	Install a snow fence during snow season to prevent snow drifting on Strickersville Rd	Existing	Snow Storm	2	Twp. DPW		Medium	Low	Municipal Budget	Short	Medium	SIP
LondonBritainT-4	Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonBritainT-5	Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonBritainT-6	Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonBritainT-7	Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonBritainT-8	Install gates to be closed during flood incidents and signage at Yeatmans Station Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
London Grove Township												
LondonGroveT-1	Emergency alerting systems/public notification system for London Grove Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
LondonGroveT-2	Install alerting system/public notification system to profiteering/notification of	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and	Short	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.								Local Grants and Municipal Funds			
LondonGroveT-3	Install gates and signage within flood-prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters.	Existing	Flood, Flash Flood, and Ice Jam	2,3	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonGroveT-4	Protect West Grove Sewage Treatment Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA, EMC		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	Short	Medium	SIP
LondonGroveT-5	Reconfigure stream channel at Sullivan Rd & Clay Creek Rd	Existing	Flood, Flash Flood, and Ice Jam	3	London Grove DPW		Medium	High	Hazard Mitigation grants, Flood Mitigation grants	Long	Low	SIP
LondonGroveT-6	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp., DPW	DES	High	Medium	FEMA, PEMA	Long	Medium	SIP
LondonGroveT-7	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable until as opposed to three permanent generators providing additional costs savings.	Existing	Utility Interruption	2	Twp., DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LondonGroveT-8	The municipal FPA to work with the West Grove Wastewater Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA, EMC	DES	High	High	Operating Budget	Short	Medium	EAP
LondonGroveT-9	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources	Existing	Flood, Flash Flood, and Ice Jam	1	Twp., DPW		High	High	FEMA, PEMA, Municipal and Private Funding	Short	High	SIP
LondonGroveT-10	To remove an existing narrow culvert and replace with a structure to span the base flood elevations. Portions or all the structure removal and replacements could be completed utilizing Municipal Public Works.	Existing	Flood, Flash Flood, and Ice Jam	1	Twp., DPW		High	High	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Long	High	SIP
LondonGroveT-11	Widen bridge and bridge approaches at Indian Run Rd	Existing	Flood, Flash Flood, and Ice Jam	1	Twp., DPW		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
Londonderry Township												
LondonderryT-1	Work with PennDOT to clear the brush in roadway lines of sight at Rt 796 and Rt 41	Existing	Transportation Accidents	2	Twp.	PennDOT	High	Medium	Operating Budget; PA DEP	Short	Medium	SIP
LondonderryT-2	Work with PennDOT to construct a roundabout at the intersection of PA Route 41 and PA route 926	Existing	Transportation Accidents	1,2	Twp.	PennDOT	High	High	PennDOT, Londonderry Township	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LondonderryT-3	Emergency alerting systems/public notification system for Londonderry Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
LondonderryT-4	Improve and enhance culverts on Jackson Rd and Faggs Manor Rd	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.	PennDOT	Medium	Medium	State funding	Short	Medium	SIP
LondonderryT-5	Improve plans and communication in case of emergency.	Existing	Environmental Hazards Gas and Liquid Pipelines	1	ESNG	Londonderry Township, Cochranville Fire Co	Medium	Low	ESNG	Short	Medium	LPR
LondonderryT-6	Increase the height of the bridge at Whitehorse Rd near Creek Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
LondonderryT-7	Install a generator in the Township Building	Existing	Utility Interruption	2	Twp.		High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
LondonderryT-8	Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station	Existing	Snow Storm	2	Twp. DPW		Medium	Low	Municipal Budget	Short	Medium	SIP
LondonderryT-9	Purchase 2-way radios to assist in communication during emergency events in the township	Existing	All Hazards	2	Twp.	DES	High	Medium	County; SEPA RTF	Short	Medium	SIP
LondonderryT-10	Purchase and install a backup generator at the Municipal Building	Existing	Utility Interruption	2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LondonderryT-11	Work with PennDOT to reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	PennDOT	High	High	PennDOT, Operating Budget	Long	Medium	SIP
Lower Oxford Township												
LowerOxfordT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Octoraro Water Company and Pine Grove Covered Bridge	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Malvern Borough												
MalvernB-1	Elevation/Acquisition of structure located at 135 Powelton Ave	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
MalvernB-2	Elevation/Acquisition of structure located at 145 Powelton Ave	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
MalvernB-3	Elevation/Acquisition of structures 10 through 142 W First Ave	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Improvement Budget			
MalvernB-4	Elevation/Acquisition of structures 193 through 323 Paoli Pike	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
MalvernB-5	Elevation/Acquisition of structures 2 through 10 Remington Ln	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
MalvernB-6	Elevation/Acquisition of structures 217 through 545 S. Warren Ave	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
MalvernB-7	Increase culvert size at 313 S Warren Ave	Existing	Flood, Flash Flood, and Ice Jam	2	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
MalvernB-8	Work with management of Malvern Preparatory School to protect the buildings to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	Operating Budget	Short	Medium	SIP
Modena Borough												
ModenaB-1	Determine the specific vulnerability of the Modena Borough Building to dam failure and determine	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	appropriate mitigation measures.											
ModenaB-2	Protect Modena Ambulance EMS Station from vulnerabilities to dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
ModenaB-3	Protect Modena FC Fire Station from a potential dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
ModenaB-4	The Municipal FPA will work with the Mahoney-Modena owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	EAP
ModenaB-5	The Municipal FPA will work with the Sealed Air Corporation owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerably from dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	EAP
ModenaB-6	Work with the Mode Paper Mill owner to determine what flood protection measures can be taken to protect it from the vulnerabilities of dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Newlin Township												
NewlinT-1	Determine the specific vulnerability of the Newlin Township Building to dam failure and determine appropriate mitigation measures.	Existing	Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
NewlinT-2	Fix and pave road that has been destroyed on Laurel	Existing	Transportation Accidents	2	DES	Newlin Township	High	High	Operating Budget	Long	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Road including three driveways											
NewlinT-3	Protect the Embreeville Sewage Treatment from dam failure and protect it to the 0.2% annual chance flood event and from vulnerabilities to dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	Short	Medium	SIP
NewlinT-4	Replant Ash Trees that were lost to the Ash Borer and determine the best actions to prevent invasive species in the future	Existing	Invasive Species	2,3	Twp.		Medium	Medium	Operating budget	Short	Medium	NSP
NewlinT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Embreeville Historic District, House at Upper Laurel Iron Works, Marlborough Village Historic District, Spruce Groce School House, Worker's House at Lower Laurel Iron Works	Existing	Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
New Garden Township												
NewGardenT-1	Construct larger culvert at Cedar Springs Rd at Pemberton Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
NewGardenT-2	Construct larger culvert at Egypt Run Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCEM FMP; Capital Improvement Budget	Short	Low	SIP
NewGardenT-3	Emergency alerting systems for New Garden Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
NewGardenT-4	Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike	Existing	Utility Interruption	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
NewGardenT-5	Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike	Existing	Utility Interruption	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
NewGardenT-6	Purchase portable generator for traffic signal at Newark Rd and Rt 41	Existing	Utility Interruption	2	Twp./ DPW	PennDOT	High	High	FEMA HMGP, BRIC; Operating Budget, PennDOT	Short	Medium	SIP
NewGardenT-7	Purchase portable generator for traffic signal at Penn Green Rd and Rt 41	Existing	Utility Interruption	2	Twp./ DPW	PennDOT	High	High	FEMA HMGP, BRIC; Operating Budget, PennDOT	Short	Medium	SIP
NewGardenT-8	Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike	Existing	Utility Interruption	2	Twp./ DPW	PennDOT	High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Budget, PennDOT			
NewGardenT-9	Purchase portable generator for traffic signal at Southwood Rd and Rt 7	Existing	Utility Interruption	2	Twp./ DPW	PennDOT	High	High	FEMA HMGP, BRIC; Operating Budget, PennDOT	Short	Medium	SIP
NewGardenT-10	Work with To-jo Mushrooms Inc. management to protect the building to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	EMC, FPA	To-jo Mushrooms Inc. management	High	High	Operating Budget	Short	Medium	SIP
North Coventry Township												
NorthCoventryT-1	Protect the North Coventry Municipal Authority from dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
NorthCoventryT-2	The municipal FPA to work with the North Coventry Municipal Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	North Coventry Municipal Authority facility owner/operator	High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
NorthCoventryT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Schuylkill Navigation Company Canal and historic structure located on SR 7046	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Oxford Borough												
OxfordB-1	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8th Street.	Existing	Flood, Flash Flood, and Ice Jam	3	Boro.		Medium	High	Grants and/or general fund revenues	Short	Medium	NSP
Parkesburg Township												
ParkesburgB-1	The municipal FPA will work with the Hayes Heating and Cooling Bulk owner/operator to protect the facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	EMC, FPA	Hayes Heating and Cooling Bulk owner/operator	High	High	Operating Budget	Short	Medium	EAP
ParkesburgB-2	Work with power company to protect Parkesburg - N Church St Electrical Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	2	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
Penn Township												
PennT-1	Enhance stormwater management regulations	Existing	Flood, Flash Flood, and Ice Jam	1,2	FPA	DES	High	Low	Municipal Budget	Short	Medium	LPR
PennT-2	Work with power company to protect Penn - Neward Road Electrical Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP,	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
Pennsbury Township												
PennsburyT-1	Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	PennDOT	High	High	PennDOT, Operating Budget	Short	High	SIP
PennsburyT-2	Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	PennDOT	High	High	PennDOT, Operating Budget	Short	High	SIP
PennsburyT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Bissel/Hill Girt/Beverly Rural Historic District and Delaware Boundary Makers.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	Owners/operators	High	High	Operating Budget	Short	Medium	SIP
Phoenixville Borough												
PhoenixvilleB-1	Improve drainage at the intersection of Bridge and Church St.	Existing	Flood, Flash Flood, and Ice Jam	1	Boro.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
PhoenixvilleB-2	Protect the District Court 15-2-01 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
PhoenixvilleB-3	Protect the Phoenixville Boro PD to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
PhoenixvilleB-4	Protect the Phoenixville Water Treatment to the 0.2% annual chance flood event and from dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
PhoenixvilleB-5	The municipal FPA to work with the Phoenixville Water Plant facility owner/operator to protect the facility to at least the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
PhoenixvilleB-6	Work with the management of major businesses to protect the buildings from dam failure and to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
PhoenixvilleB-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Black Rock Bridge, Lobok, John, Property,	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Mansion House, and Phoenixville Canal Spur											
Pocopson Township												
PocopsonT-1	Assess and determine the best action to prevent flooding around Brandywine Creek on Northbrook Road, one lane historical bridge	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	Operating Budget	Short	Low	SIP
PocopsonT-2	Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding	Existing	Transportation Accidents, Flood, Flash Flood, and Ice Jam	1	Twp. DPW	Gilmore and Associates	High	High	2021 Pocopson Township budget	Short	High	SIP
PocopsonT-3	The municipal FPA to work with the Lenape Forged Products Corp facility owner/operator to protect the facility from the vulnerabilities of dam failure.	Existing	Dam Failure	1,2,4	FPA, EMC	Lenape Forged Products Corp facility owner/operator	High	High	Operating Budget	Short	Medium	EAP
PocopsonT-4	Work with power company to protect the Pocopson - Lenape Unionville Road Electrical Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
PocopsonT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pocopson	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Station, State Route 3027, and Wilkinson House											
Sadsbury Township												
SadsburyT-1	Assess and determine the best action to improve drainage and reduce flooding on Greenbelt Drive	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
SadsburyT-2	Install gates to be closed during flood incidents and signage on sections of Old Mill Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
Schuylkill Township												
SchuylkillT-1	Acquisition/Elevation of the structure located at 493 State Creek Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
SchuylkillT-2	Construct Larger Culvert at East Phillip Drive	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
SchuylkillT-3	Construct larger culvert at S Whitehorse Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
SchuylkillT-4	Determine specific vulnerability to dam failure	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	and determine appropriate mitigation measures for the Valley Forge Sewage Treatment Plant											
SchuylkillT-5	Plant bushes/other vegetation to stop drifting snow in known problem areas	Existing	Winter Storms	2	Twp. DPW		Medium	Low	Municipal Budget	Short	Medium	SIP
SchuylkillT-6	Protect Structure with Barrier at Creek Road Bridge	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	DES	Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
SchuylkillT-7	Retrofit critical public facilities with safe rooms	Existing	Terrorism	2	Twp.		Medium	High	FEMA, PEMA	Long	Medium	SIP
SchuylkillT-8	The municipal FPA to work with the Aqua Pickering Water Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
SchuylkillT-9	The municipal FPA to work with the Valley Forge Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
SchuylkillT-10	Work with power company to protect Schuylkill - Valley Forge Road to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
SchuylkillT-11	Work with YMCA management to protect the building to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
South Coatesville Borough												
SouthCoatesvilleB-1	Investigate stormwater management options and identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents throughout South Coatesville Borough	Existing	Flood, Flash Flood, and Ice Jam	2	Boro.	DES	Medium	Medium	FEMA HMGP, BRIC; Operating Budget	Long	Medium	SIP
SouthCoatesvilleB-2	Protect the Coatesville Sewer Authority from dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	DES, LEPC	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	Short	Medium	SIP
SouthCoatesvilleB-3	The municipal FPA will work with the Scrap Metal Services owner/operator to protect the facility to the 0.2% annual chance level.	Existing	Dam Failure	1,2,4	EMC, FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
South Coventry Township												
SouthCoventry-1	Construct larger culvert at Bealor Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.	DES	Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
SouthCoventry-2	Determine the best action to prevent downhill flooding on Coventryville Rd & Harmonyville Road, close to North Cov. Border	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
SouthCoventry-3	Install flood water collection boxes and piping on Schoolhouse Road and Porter's Mill Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	County	Short	High	SIP
SouthCoventry-4	Purchase and install a backup generator for the Woodridge Sewer Plant at 190 Ridgeview Drive	Existing	Utility Interruption	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
SouthCoventry-5	Work with power company to protect South Coventry - Porters Mill Road Electrical Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2, 4	FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
SouthCoventry-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Coventryville Historic District and Coventryville Historic District (1975)- HDA	Existing	Flood, Flash Flood, and Ice Jam	1,2, 4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Spring City Borough												
SpringCityB-1	Protect the Spring City Sewer Plan from the vulnerably to dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2, 4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	Short	Medium	SIP
SpringCityB-2	The municipal FPA will work with the Hydromotion owner/operator to protect the facility from the	Existing	Dam Failure	1,2, 4	FPA, EMC	DES, LEPC	High	High	Operating Budget		Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	vulnerabilities of dam failure											
SpringCityB-3	Work with management of major businesses to protect the buildings from the vulnerability to dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	Operating Budget	Short	Medium	SIP
SpringCityB-4	Work with the Textile Mill owner to determine what flood protection measures can be taken to protect the facility from the vulnerabilities from dam failure	Existing	Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Thornbury Township												
ThornburyT-1	Work with PennDOT to conduct an assessment of flood-prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	Low	PennDOT, Municipal Budget	Short	High	SIP
ThornburyT-2	Install gates to be closed during flood incidents and signage at Rt 926 and Creek Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
ThornburyT-3	Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
ThornburyT-4	Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
ThornburyT-5	Install gates to be closed during flood incidents and signage at Westtown-	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	High	FEMA HMGP, BRIC;	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Thornton Rd north of Railroad Bridge								Operating Budget			
ThornburyT-6	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge	Existing	Flood, Flash Flood, and Ice Jam	1,2	PennDOT	Thornbury Township	High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
ThornburyT-7	Work with power company to protect Thornbury - Westtown Road Electrical Substation to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2, 4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
Tredyffrin Township												
TredyffrinT-1	Clogged inverts throughout the township causing flooding	Existing	Flood, Flash Flood, and Ice Jam	1,2	DES, Twp.	PennDOT	Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Low	SIP
TredyffrinT-2	Improve drainage to reduce flooding on Hadwick Road and Upper Weedly Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.	DES	Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Low	SIP
TredyffrinT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cedar Hollow Industrial Track: Bridge, County Bridge No. 171, Great Valley Mill, Jerman, Thomas, Property, and	Existing	Flood, Flash Flood, and Ice Jam	1,2, 4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	historic structure on SR 7015											
TredyffrinT-4	Improve drainage to reduce flooding on Wills Lane, Woodcrest Drive, and Saunders Drive	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.	DES	Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Low	SIP
Upper Uwchlan Township												
UpperUwchlanT-1	Acquisition/elevation of the structure located at 2 Kiloran Wynd	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
UpperUwchlanT-2	Acquisition/elevation of the structure located at 80 Saint Andrews Ln	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
UpperUwchlanT-3	Protect Larkins Bridge with barrier	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-4	Protect structure with barrier on Dorothy Lane	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
UpperUwchlanT-5	Protect structure with barrier on Font Road	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-6	Protect structure with barrier on Lyndell Road	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-7	Protect structure with barrier on Moore Road and Turnstone Way	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-8	Protect structure with barrier on St Andrews Lane	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-9	Protect Windsor Schoolhouse with barrier	Existing	Flood, Flash Flood, and Ice Jam	2	EMC		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-10	Raise Fellowship Road roadway at Red Bone Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		High	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Improvement Budget			
UpperUwchlanT-11	Stormwater culvert and basin re-sizing on Greenridge Road	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
UpperUwchlanT-12	Stormwater culvert and basin re-sizing on Krauser Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
Valley Township												
ValleyT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from vulnerabilities to dam failure: County Bridge No. 101 and Scott Farm Property	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	FPA, EMC	PHMC	High	High	Operating Budget	Short	Medium	SIP
ValleyT-2	Assess and determine the best action to protect Wagontown Road near the West Branch of the Brandywine Creek, and implement the action.	Existing	Flood, Flash Flood, and Ice Jam; Hurricane and Tropical Storm; Utility Interruption	1, 2	EMC	FPA; Public Works; Chester County DES; Chester County Department of Community Development	High	\$2-3 million	Capital Improvement Program; CDBG; BRIC	Short	High	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ValleyT-3	Assess drainage into Sucker Run near South Park Avenue and PA-372 to identify the best action to prevent flooding during heavy rainfall events, and implement the action.	Existing	Flood, Flash Flood, and Ice Jam	2, 3	FPA	EMC, Public Works	High	High	Capital Improvement Program; CDBG; BRIC	Short	Medium	SIP
Wallace Township												
WallaceT-1	Protect Glenmoore FC Fire Station from a potential dam failure	Existing	Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
WallaceT-2	The municipal FPA to work with the Verizon Glenmoore ESS Bldg. facility owner/operator to protect the facility from the vulnerabilities to dam failure	Existing	Dam Failure	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
WallaceT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Glenmoore Historic District and Steels Bridge	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
Warwick Township												
WarwickT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	to the 0.2% annual chance flood level: Hockley Mill Farm, Knauer Patent Thematic District, North Warwick Historic & Archaeological District (HDA), North Warwick HDA, and historic structure located on SR 7015											
West Bradford Township												
WestBradfordT-1	Acquire and install back-up generator at Wastewater Treatment Plant	Existing	Utility Interruption	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
WestBradfordT-2	Improve drainage on Broad Run Road between Beacon Hill	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
WestBradfordT-3	Install 4 gates to be closed during flood incidents and signage at Downingtown Pike between Harmony Hill Rd and Skelp Level Rd	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
WestBradfordT-4	Protect the Broad Run Sewage Treatment Plant from dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2, 4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WestBradfordT-5	Work with the management of Ram-t Construction Specialist to protect the buildings from dam failure.	Existing	Dam Failure	1,2,4	EMC, FPA	Ram-t Construction management	High	High	Operating Budget	Short	Medium	SIP
WestBradfordT-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Derbydown Homestead, Northbrook Historic District, Pennsylvania Railroad: Morrisville Lien: Viaduct	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Brandywine Township												
WestBrandywineT-1	Work with the Grow, James, House property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Chester Borough												
WestChesterB-1	Obtain a backup generator for Goodwill Fire Company	Existing	Utility Interruption	2	Boro./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
WestChesterB-2	The municipal FPA to work with the National Foam facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA		High	High	Operating Budget	Short	Medium	EAP
West Fallowfield Township												



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WestFallowfieldT-1	Work with the Ross Fording Road Bridge property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Goshen Township												
WestGoshenT-1	Improve culvert at 103 Oak Lane	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WestGoshenT-2	Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
WestGoshenT-3	The municipal FPA to work with the A. Duie Plyle PB II Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
WestGoshenT-4	The municipal FPA to work with the A. Duie Plyle Bolmar Street Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
WestGoshenT-5	The municipal FPA to work with the A. Duie Plyle West Chester Truck Terminal facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WestGoshenT-6	The municipal FPA to work with the Wire and Cable Specialties facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
WestGoshenT-7	Work with the Greystone Hall property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Marlborough Township												
WestMarlborough T-1	Assess and determine the best actions to prevent flooding on bridges along Rt 82 from Unionville to Coatesville	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
WestMarlborough T-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: House at Springdell, Pennock, Martha House & Industrial Site, and Speakman No.1 Covered Bridge	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Nantmeal Township												
WestNantmealT-1	Work with the Isabella Furnace owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
West Nottingham Township												
WestNottinghamT-1	Install gates to be closed during flood incidents and signage at Fremont Road between Willow Road and King Pen Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
WestNottinghamT-2	Install gates to be closed during flood incidents and signage at Park Road between Veteran's Drive and Sand Hill Road	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
West Pikeland Township												
WestPikelandT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Anselma Mill District-HDA, Clinger-Moses Mill Complex, Lightfoot Mill, and Vitale House	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP
West Vincent Township												
WestVincentT-1	Backup Generators (2) Acquisition and Installation at Matthews Meadows Sewer Plant	Existing	Utility Interruption	2	Twp./ DPW		High	High	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
WestVincentT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Halls Covered Bridge, Tyson's Bridge, and	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	historic structure on Kimberton Road											
West Whiteland Township												
WestWhitelandT-1	Elevation/acquisition of structure located at 116 N. Locust Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-2	Elevation/acquisition of structure located at 117 N. Locust Lane	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-3	Elevation/acquisition of structure located at 117 Valley Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-4	Elevation/acquisition of structure located at 118 Valley Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-5	Elevation/acquisition of structure located at 120 Valley Road	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WestWhitelandT-6	Elevation/Acquisition of structure located at 510 Winding Way	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-7	Elevation/acquisition of structure located at 512 Winding Way	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-8	Elevation/acquisition of structure located at 513 Winding Way	Existing		2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
WestWhitelandT-9	Remove silt/clean Valley Creek bed	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		High	Medium	Operating Budget; PA DEP	Short	Medium	NSP
WestWhitelandT-10	The municipal FPA to work with the Verizon Exton ESS Bldg. facility owner/operator to protect the facility to at least the 0.2% chance flood level	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	DES, LEPC	High	High	Operating Budget	Short	Medium	EAP
WestWhitelandT-11	Work with power company to protect West Whiteland - S Whitford Road Electrical Substation to the 0.2% annual chance flood event.	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	Power Company	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
WestWhitelandT-12	Work with the property owners of the following facilities to determine what	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Colebrook Manor, Exton Hotel, Thomas, John Roberts, Tennant Farmstead, Turnpike Station House, Whitford Station House, and William's Deluxe Cabins											
Westtown Township												
WesttownT-1	Acquire/elevate roadways/properties along Chester Creek - Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive	Existing	Flood, Flash Flood, and Ice Jam	2	DES	EMC	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP	Long	Medium	SIP
WesttownT-2	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating invasive species risks.	Existing	Invasive Species	2,3	Twp.		Medium	Medium	FEMA HMGP, Westtown Township	Short	Medium	NSP
WesttownT-3	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP	Short	Medium	SIP
WesttownT-4	Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.	New	All Hazards	2,4	Twp.	DES	High	Low	Operating Budget	Short	High	EAP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WesttownT-5	Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.	New	All Hazards	2,4	Twp.	DES	High	Low	Operating Budget	Short	High	EAP
WesttownT-6	Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.	New	All Hazards	2,4	Twp.	DES	High	Low	Operating Budget	Short	High	EAP
WesttownT-7	Work with PennDOT to conduct an assessment on how to improve design of Route 352/Rt. 3 intersection	Existing	Transportation Accidents	1	Twp.	PennDOT	High	High	PennDOT, Municipal Budget	Long	Low	SIP
WesttownT-8	Work with PennDOT to conduct an assessment to improve the design of Route 202 at 926 intersection and High Street/202 merge	Existing	Transportation Accidents	1	Twp.	PennDOT	High	High	PennDOT, Municipal Budget	Long	Low	SIP
WesttownT-9	Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.	New	All Hazards	2,4	Twp.		High	Low	Operating Budget	Short	High	EAP
WesttownT-10	Protect critical infrastructures (Schools, daycare, apartment buildings, and nursing home) on Rt. 202 around Skiles Blvd from HAZMAT transportation accidents	Existing	Environment Hazards Hazardous Material Releases, Transportation Accidents	1	EMC	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	LPR
WesttownT-11	Protect the following properties from a potential pipeline incident: Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West	Existing	Environmental Hazard Gas and Liquid Pipelines	1	EMC	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	LPR



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Chester, PA 19382) . Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352											
WesttownT-12	Protect the Westtown Wastewater Treatment Plant from dam failure and to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jam, Dam Failure	1,2,4	EMC, FPA		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Short	Medium	SIP
WesttownT-13	Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.	New	All Hazards	2,4	Twp.		High	Low	Operating Budget	Short	High	EAP
WesttownT-14	Work with PennDOT to redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge	Existing	Transportation Accidents	1	Twp.	PennDOT	High	High	PennDOT, Municipal Budget	Long	Low	SIP
WesttownT-15	Work with PennDOT to redesign the intersection of SR 926 and Avonlea Circle and Tanguy Road to improve line of sight.	Existing	transportation Accidents	1	Twp.	PennDOT	High	High	PennDOT, Municipal Budget	Long	Low	SIP
WesttownT-16	Retrofit WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.	Existing	Flood, Flash Flood, and Ice Jam	2	EMC, FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP	Long	Medium	SIP
WesttownT-17	Work with the County Bridge No. 148 owner to determine what flood protection measures can be taken to protect it to the	Existing	Flood, Flash Flood, and Ice Jam	1,2,4	EMC, FPA	PHMC	High	High	Operating Budget	Short	Medium	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	0.2% annual chance flood level.											
Willistown Township												
Willistown T-1	Elevation/Acquisition of the structure located at 1 Eisenhower Dr	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
Willistown T-2	Elevation/Acquisition of the structure located at 116 Davis Rd	Existing	Flood, Flash Flood, and Ice Jam	2	FPA	DES	High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	Long	Medium	SIP
Willistown T-3	Emergency alerting systems for Willistown Township	Existing	All Hazards	4	Twp./ EMC		Medium	Low	FEMA, PEMA, Regional and Local Grants and Municipal Funds	Short	Low	SIP
Willistown T-4	Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd	Existing	Flood, Flash Flood, and Ice Jam	2	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
Willistown T-5	Increase drainage basin size at Rustmont Homeowners Association	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Willistown T-6	Increase drainage basin size behind Malvern Fire Company	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
Willistown T-7	Increase drainage basin size of the Family Life Basin	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
Willistown T-8	Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd	Existing	Flood, Flash Flood, and Ice Jam	1	Twp.		Medium	Medium	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
Willistown T-9	Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
Willistown T-10	Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	Existing	Flood, Flash Flood, and Ice Jam	1,2	Twp.		High	High	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
Willistown T-11	Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek	Existing	Flood, Flash Flood, and Ice Jam	1	DPW		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP



Initiative*	Mitigation Initiative	Applies to New and/or Existing Structures**	Hazard(s) Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Willistown T-12	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd	Existing	Flood, Flash Flood, and Ice Jam	1	DPW		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
Willistown T-13	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	Existing	Flood, Flash Flood, and Ice Jam	1	DPW		High	High	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP

Notes:

* The letters associated with the initiative number indicate the lead agency (i.e., County or municipality).

** Does this mitigation initiative reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

- Boro. = Borough
- BRIC = Building Resilient Infrastructure and Communities
- CCWRA = Chester County Water Resources Authority
- DES = Department of Emergency Services
- DPW = Department of Public Works
- EMC = Emergency Management Coordinator
- EMS = Emergency Medical Services
- FEMA = Federal Emergency Management Agency
- FMA = Flood Mitigation Assistance
- FMP = Flood Mitigation Program
- FPA = Floodplain Administrator
- HAZMAT = Hazardous Materials
- LEPC = Local Emergency Preparedness Committee
- PA DCED = Pennsylvania Department of Community and Economic Development
- PEMA = Pennsylvania Emergency Management Agency
- PennDOT = Pennsylvania Department of Transportation
- PHMC = Public Health Management Corporation
- Twp. = Township
- WWTP = Wastewater Treatment Plant

Costs:

These rough estimates should be used where actual project costs cannot reasonably be established at this time:

- Low = < \$10,000
- Medium = \$10,000 to \$100,000
- High = > \$100,000

- DOF = Depending on funding
- HMGP = Hazard Mitigation Grant Program

Timeline:

Short Term = 1 to 5 years. Long Term = 5 years or greater.



Note: Some of the identified mitigation initiatives in Table 6-4 are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in County or municipal priorities. Actions that have been carried over from the 2015 version of the HMP may have been reworded and given a new initiative designation to conform to current needs and procedures.

Mitigation Category:

- *Education and Awareness Programs (EAP) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*
- *Local Plans and Regulations (LPR) - Actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.*
- *Natural Systems Protection (NSP) - Actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Structure and Infrastructure Project (SIP) - Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*



6.4.2 Mitigation Strategy Prioritization and Implementation

Section 201.6(c) (3) (iii) of Title 44 of the *Code of Federal Regulations* (44 CFR) requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost-benefit review of the proposed projects and their associated costs. This allows the jurisdictions to select the most cost-effective actions for implementation first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks.

Mitigation benefits are defined as future damage and losses that would be eliminated and/or reduced by implementing the proposed mitigation project, and include physical damage to structures and infrastructure, loss of service or function, and emergency management costs. Particularly for physical (“shovel-in-the-ground”) mitigation projects, jurisdictions were encouraged to estimate project costs as well as to identify the anticipated benefits. Where exact project costs and potential benefits were not available, ranges were identified (high, medium, low) for each, allowing a qualitative evaluation of project cost-effectiveness.

PEMA developed a mitigation action evaluation and prioritization process to provide a consistent, uniform approach for counties and jurisdictions for use in considering, in a systematic way, the best mitigation strategies for their communities (PEMA 2020). Jurisdictions first evaluate feasibility of mitigation actions by using the following ten evaluation criteria:

- **Life Safety:** The Planning Team assesses to what extent a mitigation action will protect individuals from being injured or killed by a hazard.
- **Property Protection:** The Planning Team assesses to what extent the action will protect property, including homes, businesses, and critical infrastructure.
- **Technical:** It is important to determine whether the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. The Planning Team then determines whether the alternative action is a whole or partial solution, or not a solution at all.
- **Political:** Understanding current opinions of community and state political leadership regarding issues related to the environment, economic development, safety, and emergency management will provide valuable insight into the level of political support offered for mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability.
- **Legal:** Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, the Planning Team determines whether a jurisdiction has the legal authority at the state, tribal, or local level to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities. Jurisdictions should identify the unit of government undertaking the mitigation action and include an analysis of the inter-relationships between local, regional, state, and federal governments. Legal authority is likely to have a significant role later in the process when the state, tribe, or community determines the ways in which mitigation activities can best be carried out, and the extent to which mitigation policies and programs can be enforced.
- **Environmental:** Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities. In addition, many statutory considerations, such as the National Environmental Policy Act (NEPA), should be considered when using federal funds. When implementing mitigation actions, jurisdictions need to evaluate the potential negative consequences to environmental assets, such as threatened and endangered species, wetlands, and other protected natural resources.
- **Social:** The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects must be evaluated in terms of community acceptance. Likewise, the Planning



Team should determine if implementing a mitigation action will have a beneficial or negative effect on a particular segment of the population.

- **Administrative:** Under this part of the evaluation criteria, the Planning Team examines the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine whether the jurisdiction has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.
- **Local Champion:** Having an individual lead the implementation of a project, particularly a complex project, is essential for implementing it.
- **Other Community Objectives:** The Planning Team evaluates to what extent implementing the mitigation action supports other community objectives, such as increasing parks and recreation, quality of life, and economic development.

Table 6-5 shows the feasibility evaluation for each identified mitigation action. The feasibility or effectiveness of each action is assessed in relation to the above criteria as indicated with a “+” (highly effective or feasible), “N” (neutral or not applicable), or a “-” (ineffective or not feasible). All actions were deemed feasible.



Table 6-5. Evaluation of Mitigation Actions

Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ChesterC-1	As opportunities arise, elevate, or acquire properties within flood-prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-2	Coordinate utilization of privately-owned digital billboards for emergency usages	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-3	Create a website to assist landowners and municipalities to navigate FEMA resources	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-4	Develop a countywide Debris Management Plan	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-5	Develop a plan to stagger traffic and implement delays/early releases for schools, government, and private sector during a disaster	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-6	Develop an outreach and awareness program and provide to municipalities, where residents and potential homeowners could access to identify any risks they might have to address	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-7	Develop and implement a model natural conservation ordinance for municipal adoption	N	+	+	+	+	+	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-8	Educate county residents on the NFIP following flood events	N	+	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)
ChesterC-9	Educate the public on all the hazards they face	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-10	Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
ChesterC-11	Encourage municipalities to adopt an ordinance outlining the process to implement a snow emergency declaration	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-12	Encourage municipalities to require radon testing at the time sale of homes	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ChesterC-13	Encourage new development planning to include burying of utility cables	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-14	Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-15	Enhance the household hazard waste program to reduce post-event hazardous debris	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-16	Ensure that the county has a COOP/COG Plan and procedures in place for off-site hazmat releases that can affect the buildings.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-17	Ensure that the municipal EMAs have COOP/COG plans	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-18	Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-19	Improve storm drains throughout the county to handle snow melt	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-20	Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-21	Increase cell coverage and telecommunications bandwidth in areas with poor coverage	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-22	Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-23	Install back-up power sources for traffic signals (generator, battery, solar)	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-24	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-25	Investigate the interaction of public agencies and camera data from private companies/citizens	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ChesterC-26	Plan for replenishment fuel for generators	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-27	Plant bushes/other vegetation to stop drifting snow in known problem areas	+	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-28	Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-29	Provide education to the municipalities on flood gauges.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-30	Provide education to the municipalities on resident evacuation processes and need	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-31	Provide public education on traffic accident reduction	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-32	Provide public information on debris management	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-33	Purchase backup generators for critical infrastructure/key resources	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-34	Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-35	Retrofit critical public facilities with safe rooms	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-36	Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-37	Sustain tree management programs around power lines	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ChesterC-38	The county and all municipalities will work with their major businesses to ensure they have continuity plans in place.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ChesterC-39	The county and all municipalities with a dam will work with dam operators to ensure they are protected to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
ChesterC-40	The county and municipalities will work with the higher education facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-41	The county and municipalities will work with the intermediate care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-42	The county and municipalities will work with the long-term care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-43	The county and municipalities will work with the senior living facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-44	The county will assess their bridges to determine what measures can be taken to protect them to the 0.2% annual chance flood level.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-45	The county will work with all municipalities that have a child care facility exposed to any of the hazards to work with the child care facility operators to discuss hazards they face and ensure their emergency plans address those hazards	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-46	Update countywide Model Stormwater Ordinance	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-47	When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-48	Work with district courts to ensure they have plans in place for off-site hazmat releases that can affect the courts.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-49	Work with hazmat facilities to inform them of the hazards they face and ensure emergency plans are current.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-50	Work with hospitals to ensure they have plans in place for off-site hazmat releases that can affect hospitals.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-51	Work with schools and school districts to inform them of the hazards they face and ensure emergency plans are current.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ChesterC-52	Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-53	Work with the railroad industry to address safety concerns and aging rail infrastructure	+	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ChesterC-54	Work with the USPS on options for protecting the post offices from flooding and possible inundation from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ChesterC-55	Work with Verizon to protect the facilities from flood or dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ChesterC-56	Educate the public about resources available to combat the opioid abuse/addiction.	+	+	+	+	+	+	+	N	+	+	9 (+) 1 (N) 0 (-)
ChesterC-57	Improve telecommunications infrastructure, including accessibility of high-speed Internet connectivity, throughout the county	+	+	+	+	+	+	+	N	+	+	9 (+) 1 (N) 0 (-)
AtglenB-1	The municipal FPA will work with the Atglen Borough Sewer Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
AtglenB-2	Work with the property owner to determine what flood protection measures can be taken to protect the structure to the 0.2% annual chance flood level.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
AvondaleB-1	The municipal FPA will work with the Avondale Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
BirminghamT-1	Build an access road to Masters Way to Webb Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
BirminghamT-2	Work with PennDOT to reengineer intersection at Street Road (PA 926) bridge over Brandywine Creek	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
BirminghamT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Brinton's Mill, Lenape Bridge, and Painter, Joseph, Farm	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CalnT-1	Acquire/Elevate the building located on 135 Seltzer Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
CalnT-2	Caln Township has major businesses that are vulnerable to dam failure and will work with management to protect the buildings.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CalnT-3	Protect the Caln Radio Tower to the 0.2% annual chance flood level and from a potential dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CalnT-4	Work with Downingtown Middle School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CharlestownT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pennsylvania Railroad Bridge (No.205), Pickering Dam	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CoatesvilleC-1	Emergency Alert System	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
CoatesvilleC-2	Install gates to be closed during flood incidents and signage at 11th Avenue and railroad underpass	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CoatesvilleC-3	West End Fire Station Generator	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
CoatesvilleC-4	Protect ArcelorMital Emergency Services to the 0.2% annual chance flood level.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CoatesvilleC-5	Gibbons Run Culvert Flooding and Structural Stability	+	+	+	+	+	+	+	+	+	+	10 (+) 0 (N) 0 (-)
CoatesvilleC-6	The municipal FPA will work with the Martin-Brower facility owner/operator to protect the facility to the 0.2% annual chance flood level and dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CoatesvilleC-7	Upgrade City Hall Command Center	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
CoatesvilleC-8	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: High Bridge, Huston, Abram, House & Carriage House, Lukens Main Office Building	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
CoatesvilleC-9	Amtrak Keystone Corridor Underpass Flooding	+	+	+	+	+	N	+	N	+	+	8 (+) 2 (N) 0 (-)
CoatesvilleC-10	S. 5th Avenue Stormwater Improvements	+	+	+	+	+	+	+	+	+	+	10 (+) 0 (N) 0 (-)
CoatesvilleC-11	63 S. 5th Ave. Property Protection - protect the existing grocery store on the corner of Olive St. and S 5th Ave.	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
CoatesvilleC-12	Pre-Plan Emergency Access Routes	+	N	+	+	+	N	+	+	+	+	8 (+) 2 (N) 0 (-)
CoatesvilleC-13	Ash Park Stormwater Improvements - improve infiltration and mitigate floodwaters that pose a threat for travelers during/after storm events.	+	+	+	+	+	+	+	+	+	+	10 (+) 0 (N) 0 (-)
CoatesvilleC-14	Downtown Stormwater Improvements - upgrade Coatesville's existing stormwater infrastructure in the downtown business district	+	+	+	+	+	+	+	+	+	+	10 (+) 0 (N) 0 (-)
CoatesvilleC-15	Millview Basin - restore proper stormwater detention basin function with added water quality improvements	+	+	+	+	+	+	+	+	+	+	10 (+) 0 (N) 0 (-)
CoatesvilleC-16	Public Information Programs - develop education packages, classes, meetings, programs, etc. with the goal of improving public knowledge of potential hazards within the City and how these hazards are dealt with.	+	N	+	+	+	N	+	N	+	N	6 (+) 4 (N) 0 (-)
CoatesvilleC-17	Create a Capital Improvements Plan	N	+	+	+	+	N	+	+	+	+	8 (+) 2 (N) 0 (-)
CoatesvilleC-18	Provide backup power at the City's traffic signals, including developing a plan for implementation and refueling.	+	+	+	+	+	N	+	N	+	+	8 (+) 2 (N) 0 (-)
CoatesvilleC-19	Route 82 Slope Stability - ensure the stability of the slopes along the eastern side of Route 82 in order to maintain unimpeded direct access into and out of the City.	+	+	+	+	+	N	+	+	+	N	8 (+) 2 (N) 0 (-)
DowningtowntownB-1	Determine the specific vulnerability of the Downingtowntown Borough Building to dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-2	Downingtowntown Borough has major businesses that are vulnerable to dam failure and will work with management to protect the buildings	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
DowningtowntownB -3	Protect Alert FC Fire Station from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB -4	Protect Downingtowntown - Jefferson Ave Electrical Substation to the 0.2% annual chance flood level and from the vulnerability to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-5	Protect Downingtowntown Boro PD from potential dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-6	Protect Minquas Ambulance Fire Station from dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-7	Protect Minquas FC from potential dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-8	Protect the Downingtowntown Municipal Waste from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtowntownB-9	The municipal FPA will work with AT&T Mobility Downingtowntown - USID53712 facility owner/operator to protect the facility from its vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-10	The Municipal FPA will work with the Downingtowntown Municipal Water Authority owner/operator to the 0.2% annual chance flood level and from vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-11	The municipal FPA will work with the Inland Flexo, LLC facility owner/operator to protect the facility from its vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-12	The municipal FPA will work with the Johnson Matthey AGT facility owner/operator to protect the facility from vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-13	The municipal FPA will work with the Verizon Downingtowntown CO owner/operator to protect the facility from vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-14	The municipal FPA will work with the Victory Brewing Company, LLC owner/operator to protect the facility from vulnerability to dam failure.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DowningtowntownB-15	Work with Beaver Creek Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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DowningtownB-16	Work with Downingtown High School West to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-17	Work with East Ward Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-18	Work with Lori Petrie's Pre School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-19	Work with Regina Luminis Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-20	Work with SEPTA and Amtrak to protect the station from dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-21	Work with St. Joseph School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-22	Work with STEM Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-23	Work with Step by Step Children's House to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-24	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect the, to the 0.2% annual chance flood level and vulnerability to dam failure: Downingtown Log House, Hunt, Roger, and Mill Complex	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DowningtownB-25	Work with the United States Marine Recruiting Office to protect the structure from the vulnerabilities of dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-1	Acquisition/elevation of structure at 414 Cottage Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-2	Acquisition/elevation of structure located at 402 Cottage Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EastBradfordT-3	Acquisition/elevation of structure located at 406 Cottage Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-4	Acquisition/elevation of structure located at 418 Cottage Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-5	Acquisition/Elevation of structure located at 502 River Bed Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-6	Acquisition/Elevation of structure located at 530 River Bend Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-7	Acquisition/Elevation of structure located at 550 River Bend Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-8	Acquisition/Elevation of structure located at 558 River Bend Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBradfordT-9	Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Niels Street	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastBradfordT-10	Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-11	Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-12	Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-13	Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-14	Municipal FPA to work with the Aqua Ingrams Mill Plant facility owner/operator to protect the facility from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-15	Property protection of structure located at 1010 Valley Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EastBradfordT-16	Protect East Bradford Electrical Substation from vulnerability to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-17	Protect Good Fellowship Ambulance (Sub-Station) from the vulnerabilities from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-18	The municipal FPA to work with the PECO Bradford Substation facility owner/operator to protect the facility from vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBradfordT-19	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cope's Bridge, East Bradford Historic District- HDA, Gibson's Covered Bridge, Hance, Joseph, House & Barn, Hannum, Col. John House, Jefferis Ford Bridge, Paradise Valley Historic District, Strode's Mill, Strode's Mill Historic District, and Taylor-Cope Historic District	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastBrandywineT-1	Acquire/elevate structure at 745 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-2	Acquire/elevate structure at 755 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-3	Acquire/elevate structure at 765 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-4	Acquire/elevate structure at 775 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-5	Acquire/elevate structure at 785 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-6	Beaver Creek Dam Rehabilitation Project	+	+	+	+	+	+	+	+	+	N	9 (+) 1 (N) 0 (-)
EastBrandywineT-7	Increase size of culvert crossing at 2069 Bondsville Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastBrandywineT-8	Install a flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EastBrandywineT-9	Install generator connection at East Brandywine Baptist Church	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastBrandywineT-10	Install generator connection at Hopewell United Methodist Church	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastBrandywineT-11	Property protection of structure located at 1051 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-12	Property protection of structure located at 1061 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-13	Property protection of structure located at 1081 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastBrandywineT-14	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Bridge Mill Farm, Dowlin Farm, and Marshall's Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastCalnT-1	Determine the specific vulnerability to dam failure and determine appropriate mitigation measures for the Downingtown Sewer Authority	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastCalnT-2	The municipal FPA to work with the D.R.W.P.C.C facility owner/operator to protect the facility from vulnerabilities to flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastCoventryT-1	Acquisition/elevation of structure located at 285 Linfield Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
EastCoventryT-2	Install emergency alerting systems for East Coventry Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastCoventryT-3	Project East Coventry - Linfield Road Electrical Substation from the vulnerabilities of dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastCoventryT-4	The municipal FPA to work with Taylor Industries Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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EastCoventryT-5	Work with the property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastFallowfieldT-1	Improve drainage to reduce flooding along Mortonville Road including intersection of Mortonville Road and Sawmill Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastFallowfieldT-2	Improve drainage to reduce flooding on Timacula Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastFallowfieldT-3	Protect East Fallowfield - Spring Dell Road Electrical Substation to the 0.2% annual chance flood event	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastFallowfieldT-4	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Strasburg Rd Bridge, Speakman No.2, and the Gorden Farm	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastGoshenT-1	Work with the Goodwin Acres owner to determine what protection measures can be taken to protect them from vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastMarlboroughT-1	Emergency alerting systems for East Marlborough Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastPikelandT-1	Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastPikelandT-2	Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastPikelandT-3	Plant bushes/other vegetation to stop drifting snow in known problem areas	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EastPikelandT-4	Purchase temporary mobile camera to set up for events and use to monitor safety and security	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastPikelandT-5	Retrofit critical public facilities with safe rooms	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastPikelandT-6	The municipal FPA to work with the Cromby Generating Station facility owner/operator to protect the facility to at least the 0.2% chance flood level and from vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EastPikelandT-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and vulnerabilities to dam failure: Bernard Property, Hare's Hill Road Bridge, Hartman, Peter, Residence, Kimberton Historic District, and Rapp's Covered Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastPikelandT-8	Work with the railroad industry to address safety concerns and aging rail infrastructure	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
EastVincentT-1	Protect the Shady Lane Water Treatment Plant from dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastVincentT-2	The municipal FPA to work with the Columbia Gas Transmission/Birdsboro Heater facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities of potential dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastVincentT-3	The municipal FPA to work with the Oehlert Bros., Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastVincentT-4	The municipal FPA to work with the Shady Lane Plant-Royersford facility owner/operator to protect the facility from the vulnerabilities of dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastVincentT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Kennedy Covered Bridge and Parker's Ford	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastWhitelandT-1	Increase stormwater pipe size at Hillbrook Circle	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastWhitelandT-2	Install a generator at the Meadowview pump station	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastWhitelandT-3	Install a generator at the pump station on Flat Road	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
EastWhitelandT-4	Install gates to be closed during flood incidents and signage at Church Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastWhitelandT-5	Install gates to be closed during flood incidents and signage at Old Morehall Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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EastWhitelandT-6	Work with management of major businesses to protect the buildings to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EastWhitelandT-7	Work with the Spring Mill Complex owner to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood event.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EasttownT-1	Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
EasttownT-2	Work with Sugartown Road Bridge owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ElkT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Glen Hope Covered Bridge, Rudolph & Arthur Covered Bridge, and Stephens, Linton Covered Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
FranklinT-1	Clear out blocked inlets at 896 between Goodhope Road and Gypsy Hill	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
FranklinT-2	Divert water on 512 Chesterville Road during heavy rain events	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
FranklinT-3	Improve drainage on North Clay Creek and Churchill Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
FranklinT-4	Improve drainage to reduce flooding at Green Bridge on Strickersville Road and Appleton Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
HoneyBrookB-1	Work with PennDOT to improve US-322 corridors to mitigate traffic accidents	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
HoneyBrookT-1	The municipal FPA to work with the Honey Brook Borough Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettSquareB-1	Improve drainage on East South Street between S Walnut and Broad Street to prevent flooding	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



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KennettSquareB-2	Improve drainage on South Street at Lafayette and Grant Way	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettSquareB-3	Improve drainage on Walnut Street between Birch and East South St	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettSquareB-4	Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St, west of Union St	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettSquareB-5	The municipal FPA will work with Comcast Cable-Kennell Square Hubsite owner/operator to protect the facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-1	Acquisition/elevation of structure located at 611 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
KennettT-2	Acquisition/elevation of structure located at 903 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
KennettT-3	Acquisition/elevation of structure located at 909 Creek Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
KennettT-4	Assess and determine the best action to prevent East Hillendale Rd from flooding	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-5	Assess and determine the best action to prevent flooding of Kaolin Rd from stream	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-6	Assess and determine the best action to prevent flooding of Marshall Bridge a Route 82 South	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-7	Assess and determine the best action to prevent flooding of the West Hillendale stream from Chandler Mill to Scarlet	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-8	Assess and determine the best action to prevent further erosion of Bucktoe Road stream banks and prevent flooding of the road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettT-9	Assess and determine the best action to prevent Rosedale Road stream from overflowing onto the road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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KennettT-10	Assess and determine the best action to prevent the stream on Center Mill Road from overflowing	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-11	Install gates to be closed during flood incidents and signaled at flood intersections within the township	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-12	Install warning signs to be utilized during flood incidents at flood-prone bridges within the township	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-13	The municipal FPA to work with the AT&T SBA Kennett Square facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-14	The municipal FPA to work with the Kennett Square Borough Sewage Treatment Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
KennettT-15	Work with county to improve drainage on Bayard Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettT-16	Work with the county to improve drainage on Pemberton Road Bridge from Mill Road to Cedar Springs to prevent flooding	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
KennettT-17	Work with the county to improve drainage on South Street from Scarlet to Chandler Mill	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonBritainT-1	Emergency alerting systems for London Britain Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonBritainT-2	Install a snow fence during snow season to prevent snow drifting on South Bank Rd	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonBritainT-3	Install a snow fence during snow season to prevent snow drifting on Strickersville Rd	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonBritainT-4	Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonBritainT-5	Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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LondonBritainT-6	Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonBritainT-7	Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonBritainT-8	Install gates to be closed during flood incidents and signage at Yeatmans Station Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonGroveT-1	Emergency alerting systems/public notification system for London Grove Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonGroveT-2	Install alerting system/public notification system to profiteering/notification of potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.	N	+	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)
LondonGroveT-3	Install gates and signage within flood-prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters.	+	+	+	+	+	N	+	+	+	N	8 (+) 2 (N) 0 (-)
LondonGroveT-4	Protect West Grove Sewage Treatment Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonGroveT-5	Reconfigure stream channel at Sullivan Rd & Clay Creek Rd	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
LondonGroveT-6	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.	+	N	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)
LondonGroveT-7	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable until as opposed to three permanent generators providing additional costs savings.	+	+	+	+	+	N	+	N	+	+	8 (+) 2 (N) 0 (-)
LondonGroveT-8	The municipal FPA to work with the West Grove Wastewater Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonGroveT-9	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources	N	+	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)
LondonGroveT-10	To remove an existing narrow culvert and replace with a structure to span the base flood elevations. Portions or all the structure removal and replacements could be completed utilizing Municipal Public Works.	N	+	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)



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LondonGroveT-11	Widen bridge and bridge approaches at Indian Run Rd	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
LowerOxfordT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Octoraro Water Company and Pine Grove Covered Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LondonderryT-1	Work with PennDOT to clear the brush in roadway lines of sight at Rt 796 and Rt 41	N	+	+	+	+	+	+	N	N	N	6 (+) 4 (N) 0 (-)
LondonderryT-2	Work with PennDOT to construct a roundabout at the intersection of PA Route 41 and PA route 926	+	+	+	+	+	N	+	+	+	N	8 (+) 2 (N) 0 (-)
LondonderryT-3	Emergency alerting systems/public notification system for Londonderry Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonderryT-4	Improve and enhance culverts on Jackson Rd and Faggs Manor Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonderryT-5	Improve plans and communication in case of emergency.	+	+	+	+	+	N	+	+	+	N	8 (+) 2 (N) 0 (-)
LondonderryT-6	Increase the height of the bridge at Whitehorse Rd near Creek Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonderryT-7	Install a generator in the Township Building	+	+	+	+	+	N	+	N	+	+	8 (+) 2 (N) 0 (-)
LondonderryT-8	Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LondonderryT-9	Purchase 2-way radios to assist in communication during emergency events in the township	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
LondonderryT-10	Purchase and install a backup generator at the Municipal Building	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)



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LondonderryT-11	Work with PennDOT to reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd	+	+	+	+	+	N	+	+	N	+	8(+) 2 (N) 0 (-)
MalvernB-1	Elevation/Acquisition of structure located at 135 Powelton Ave	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-2	Elevation/Acquisition of structure located at 145 Powelton Ave	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-3	Elevation/Acquisition of structures 10 through 142 W First Ave	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-4	Elevation/Acquisition of structures 193 through 323 Paoli Pike	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-5	Elevation/Acquisition of structures 2 through 10 Remington Ln	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-6	Elevation/Acquisition of structures 217 through 545 S. Warren Ave	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-7	Increase culvert size at 313 S Warren Ave	N	+	+	+	+	N	+	+	N	N	6(+) 4 (N) 0 (-)
MalvernB-8	Work with management of Malvern Preparatory School to protect the buildings to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ModenaB-1	Determine the specific vulnerability of the Modena Borough Building to dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ModenaB-2	Protect Modena Ambulance EMS Station from vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ModenaB-3	Protect Modena FC Fire Station from a potential dam failure.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ModenaB-4	The Municipal FPA will work with the Mahoney-Modena owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)



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ModenaB-5	The Municipal FPA will work with the Sealed Air Corporation owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerability from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ModenaB-6	Work with the Mode Paper Mill owner to determine what flood protection measures can be taken to protect it from the vulnerabilities of dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NewlinT-1	Determine the specific vulnerability of the Newlin Township Building to dam failure and determine appropriate mitigation measures.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NewlinT-2	Fix and pave road that has been destroyed on Laurel Road including three driveways	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
NewlinT-3	Protect the Embreeville Sewage Treatment from dam failure and protect it to the 0.2% annual chance flood event and from vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NewlinT-4	Replant Ash Trees that were lost to the Ash Borer and determine the best actions to prevent invasive species in the future	+	+	+	+	+	+	+	N	N	N	7 (+) 3 (N) 0 (-)
NewlinT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Embreeville Historic District, House at Upper Laurel Iron Works, Marlborough Village Historic District, Spruce Groce School House, Worker's House at Lower Laurel Iron Works	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NewGardenT-1	Construct larger culvert at Cedar Springs Rd at Pemberton Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
NewGardenT-2	Construct larger culvert at Egypt Run Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
NewGardenT-3	Emergency alerting systems for New Garden Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
NewGardenT-4	Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
NewGardenT-5	Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)



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NewGardenT-6	Purchase portable generator for traffic signal at Newark Rd and Rt 41	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
NewGardenT-7	Purchase portable generator for traffic signal at Penn Green Rd and Rt 41	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
NewGardenT-8	Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
NewGardenT-9	Purchase portable generator for traffic signal at Southwood Rd and Rt 7	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
NewGardenT-10	Work with To-jo Mushrooms Inc. management to protect the building to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NorthCoventryT-1	Protect the North Coventry Municipal Authority from dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NorthCoventryT-2	The municipal FPA to work with the North Coventry Municipal Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
NorthCoventryT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Schuylkill Navigation Company Canal and historic structure located on SR 7046	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
OxfordB-1	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8th Street.	N	N	+	+	+	+	+	+	+	N	7 (+) 3 (N) 0 (-)
ParkesburgB-1	The municipal FPA will work with the Hayes Heating and Cooling Bulk owner/operator to protect the facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParkesburgB-2	Work with power company to protect Parkesburg - N Church St Electrical Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennT-1	Enhance stormwater management regulations	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
PennT-2	Work with power company to protect Penn - Neward Road Electrical Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennsburyT-1	Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennsburyT-2	Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennsburyT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Bissel/Hill Girt/Beverly Rural Historic District and Delaware Boundary Makers.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-1	Improve drainage at the intersection of Bridge and Church St.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
PhoenixvilleB-2	Protect the District Court 15-2-01 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-3	Protect the Phoenixville Boro PD to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-4	Protect the Phoenixville Water Treatment to the 0.2% annual chance flood event and from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-5	The municipal FPA to work with the Phoenixville Water Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-6	Work with the management of major businesses to protect the buildings from dam failure and to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PhoenixvilleB-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Black Rock Bridge, Lobok, John, Property, Mansion House, and Phoenixville Canal Spur	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PocopsonT-1	Assess and determine the best action to prevent flooding around Brandywine Creek on Northbrook Road, one lane historical bridge	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
PocopsonT-2	Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding	+	+	+	+	+	N	+	N	+	N	7 (+) 3 (N) 0 (-)
PocopsonT-3	The municipal FPA to work with the Lenape Forged Products Corp facility owner/operator to protect the facility from the vulnerabilities of dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PocopsonT-4	Work with power company to protect the Pocopson - Lenape Unionville Road Electrical Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PocopsonT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pocopson Station, State Route 3027, and Wilkinson House	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SadsburyT-1	Assess and determine the best action to improve drainage and reduce flooding on Greenbelt Drive	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SadsburyT-2	Install gates to be closed during flood incidents and signage on sections of Old Mill Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-1	Acquisition/Elevation of the structure located at 493 State Creek Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SchuylkillT-2	Construct Larger Culvert at East Phillip Drive	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SchuylkillT-3	Construct larger culvert at S Whitehorse Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SchuylkillT-4	Determine specific vulnerability to dam failure and determine appropriate mitigation measures for the Valley Forge Sewage Treatment Plant	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-5	Plant bushes/other vegetation to stop drifting snow in known problem areas	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SchuylkillT-6	Protect Structure with Barrier at Creek Road Bridge	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
SchuylkillT-7	Retrofit critical public facilities with safe rooms	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-8	The municipal FPA to work with the Aqua Pickering Water Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-9	The municipal FPA to work with the Valley Forge Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-10	Work with power company to protect Schuylkill - Valley Forge Road to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SchuylkillT-11	Work with YMCA management to protect the building to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SouthCoatesvilleB-1	Investigate stormwater management options and identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents throughout South Coatesville Borough	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
SouthCoatesvilleB-2	Protect the Coatesville Sewer Authority from dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SouthCoatesvilleB-3	The municipal FPA will work with the Scrap Metal Services owner/operator to protect the facility to the 0.2% annual chance level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SouthCoventry-1	Construct larger culvert at Bealor Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SouthCoventry-2	Determine the best action to prevent downhill flooding on Coventryville Rd & Harmonyville Road, close to North Cov. Border	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SouthCoventry-3	Install flood water collection boxes and piping on Schoolhouse Road and Porter's Mill Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SouthCoventry-4	Purchase and install a backup generator for the Woodridge Sewer Plant at 190 Ridgeview Drive	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
SouthCoventry-5	Work with power company to protect South Coventry - Porters Mill Road Electrical Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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SouthCoventry-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Coventryville Historic District and Coventryville Historic District (1975)-HDA	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
SpringCityB-1	Protect the Spring City Sewer Plan from the vulnerably to dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
SpringCityB-2	The municipal FPA will work with the Hydromotion owner/operator to protect the facility from the vulnerabilities of dam failure	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
SpringCityB-3	Work with management of major businesses to protect the buildings from the vulnerably to dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
SpringCityB-4	Work with the Textile Mill owner to determine what flood protection measures can be taken to protect the facility from the vulnerabilities from dam failure	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-1	Work with PennDOT to conduct an assessment of flood-prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-2	Install gates to be closed during flood incidents and signage at Rt 926 and Creek Road	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-3	Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-4	Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-5	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd north of Railroad Bridge	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-6	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)
ThornburyT-7	Work with power company to protect Thornbury - Westtown Road Electrical Substation to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	+	+	+	+	+	N	+	+	N	N	7(+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
TredyffrinT-1	Clogged inverts throughout the township causing flooding	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
TredyffrinT-2	Improve drainage to reduce flooding on Hadwick Road and Upper Weedly Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
TredyffrinT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cedar Hollow Industrial Track: Bridge, County Bridge No. 171, Great Valley Mill, Jerman, Thomas, Property, and historic structure on SR 7015	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
TredyffrinT-4	Improve drainage to reduce flooding on Wills Lane, Woodcrest Drive, and Saunders Drive	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-1	Acquisition/elevation of the structure located at 2 Kiloran Wynd	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
UpperUwchlanT-2	Acquisition/elevation of the structure located at 80 Saint Andrews Ln	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
UpperUwchlanT-3	Protect Larkins Bridge with barrier	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-4	Protect structure with barrier on Dorothy Lane	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-5	Protect structure with barrier on Font Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-6	Protect structure with barrier on Lyndell Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-7	Protect structure with barrier on Moore Road and Turnstone Way	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-8	Protect structure with barrier on St Andrews Lane	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
UpperUwchlanT-9	Protect Windsor Schoolhouse with barrier	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-10	Raise Fellowship Road roadway at Red Bone Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-11	Stormwater culvert and basin re-sizing on Greenridge Road	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
UpperUwchlanT-12	Stormwater culvert and basin re-sizing on Krauser Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ValleyT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from vulnerabilities to dam failure: County Bridge No. 101 and Scott Farm Property	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ValleyT-2	Assess and determine the best action to protect Wagontown Road near the West Branch of the Brandywine Creek, and implement the action.	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
ValleyT-3	Assess drainage into Sucker Run near South Park Avenue and PA-372 to identify the best action to prevent flooding during heavy rainfall events, and implement the action.	N	+	+	+	+	N	+	+	N	N	6 (+) 3 (N) 0 (-)
WallaceT-1	Protect Glenmoore FC Fire Station from a potential dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WallaceT-2	The municipal FPA to work with the Verizon Glenmoore ESS Bldg. facility owner/operator to protect the facility from the vulnerabilities to dam failure	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WallaceT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Glenmoore Historic District and Steels Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarwickT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Hockley Mill Farm, Knauer Patent Thematic District, North Warwick Historic & Archaeological District (HDA), North Warwick HDA, and historic structure located on SR 7015	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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WestBradfordT-1	Acquire and install back-up generator at Wastewater Treatment Plant	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
WestBradfordT-2	Improve drainage on Broad Run Road between Beacon Hill	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WestBradfordT-3	Install 4 gates to be closed during flood incidents and signage at Downingtown Pike between Harmony Hill Rd and Skelp Level Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestBradfordT-4	Protect the Broad Run Sewage Treatment Plant from dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestBradfordT-5	Work with the management of Ram-t Construction Specialist to protect the buildings from dam failure.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestBradfordT-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Derbydown Homestead, Northbrook Historic District, Pennsylvania Railroad: Morrisville Lien: Viaduct	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestBrandywineT-1	Work with the Grow, James, House property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestChesterB-1	Obtain a backup generator for Goodwill Fire Company	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
WestChesterB-2	The municipal FPA to work with the National Foam facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestFallowfieldT-1	Work with the Ross Fording Road Bridge property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestGoshenT-1	Improve culvert at 103 Oak Lane	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WestGoshenT-2	Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



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WestGoshenT-3	The municipal FPA to work with the A. Duie Pyle PB II Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestGoshenT-4	The municipal FPA to work with the A. Duie Pyle Bolmar Street Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestGoshenT-5	The municipal FPA to work with the A. Duie Pyle West Chester Truck Terminal facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestGoshenT-6	The municipal FPA to work with the Wire and Cable Specialties facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestGoshenT-7	Work with the Greystone Hall property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestMarlboroughT-1	Assess and determine the best actions to prevent flooding on bridges along Rt 82 from Unionville to Coatesville	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WestMarlboroughT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: House at Springdell, Pennock, Martha House & Industrial Site, and Speakman No.1 Covered Bridge	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestNantmealT-1	Work with the Isabella Furnace owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestNottinghamT-1	Install gates to be closed during flood incidents and signage at Fremont Road between Willow Road and King Pen Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestNottinghamT-2	Install gates to be closed during flood incidents and signage at Park Road between Veteran's Drive and Sand Hill Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestPikelandT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Anselma Mill District-HDA, Clinger-Moses Mill Complex, Lightfoot Mill, and Vitale House	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestVincentT-1	Backup Generators (2) Acquisition and Installation at Matthews Meadows Sewer Plant	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)



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WestVincentT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Halls Covered Bridge, Tyson's Bridge, and historic structure on Kimberton Road	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestWhitelandT-1	Elevation/acquisition of structure located at 116 N. Locust Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-2	Elevation/acquisition of structure located at 117 N. Locust Lane	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-3	Elevation/acquisition of structure located at 117 Valley Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-4	Elevation/acquisition of structure located at 118 Valley Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-5	Elevation/acquisition of structure located at 120 Valley Road	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-6	Elevation/Acquisition of structure located at 510 Winding Way	N	+	+	+	N	N	+	+	N	+	6 (+) 4(N) 0 (-)
WestWhitelandT-7	Elevation/acquisition of structure located at 512 Winding Way	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-8	Elevation/acquisition of structure located at 513 Winding Way	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WestWhitelandT-9	Remove silt/clean Valley Creek bed	N	+	+	+	+	+	+	N	N	N	6 (+) 4 (N) 0 (-)
WestWhitelandT-10	The municipal FPA to work with the Verizon Exton ESS Bldg. facility owner/operator to protect the facility to at least the 0.2% chance flood level	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WestWhitelandT-11	Work with power company to protect West Whiteland - S Whitford Road Electrical Substation to the 0.2% annual chance flood event.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
WestWhitelandT-12	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Colebrook Manor, Exton Hotel, Thomas, John Roberts, Tennant Farmstead, Turnpike Station House, Whitford Station House, and William's Deluxe Cabins	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WesttownT-1	Acquire/elevate roadways/properties along Chester Creek - Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WesttownT-2	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating invasive species risks.	+	+	+	+	+	+	+	N	+	N	8 (+) 2 (N) 0 (-)
WesttownT-3	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)	+	+	+	+	+	N	+	N	+	+	8 (+) 2 (N) 0 (-)
WesttownT-4	Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
WesttownT-5	Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
WesttownT-6	Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
WesttownT-7	Work with PennDOT to conduct an assessment on how to improve design of Route 352/Rt. 3 intersection	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
WesttownT-8	Work with PennDOT to conduct an assessment to improve the design of Route 202 at 926 intersection and High Street/202 merge	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
WesttownT-9	Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
WesttownT-10	Protect critical infrastructures (Schools, daycare, apartment buildings, and nursing home) on Rt. 202 around Skiles Blvd from HAZMAT transportation accidents	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WesttownT-11	Protect the following properties from a potential pipeline incident: Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West Chester, PA 19382) . Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
WesttownT-12	Protect the Westtown Wastewater Treatment Plant from dam failure and to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WesttownT-13	Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
WesttownT-14	Work with PennDOT to redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
WesttownT-15	Work with PennDOT to redesign the intersection of SR 926 and Avonlea Circle and Tanguy Road to improve line of sight.	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
WesttownT-16	Retrofit WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
WesttownT-17	Work with the County Bridge No. 148 owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Willistown T-1	Elevation/Acquisition of the structure located at 1 Eisenhower Dr	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
Willistown T-2	Elevation/Acquisition of the structure located at 116 Davis Rd	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
Willistown T-3	Emergency alerting systems for Willistown Township	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
Willistown T-4	Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
Willistown T-5	Increase drainage basin size at Rustmont Homeowners Association	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
Willistown T-6	Increase drainage basin size behind Malvern Fire Company	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
Willistown T-7	Increase drainage basin size of the Family Life Basin	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
Willistown T-8	Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
Willistown T-9	Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Willistown T-10	Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Willistown T-11	Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
Willistown T-12	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
Willistown T-13	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)



6.4.3 Prioritization of Mitigation Actions

Actions that are deemed feasible (i.e., receive a positive evaluation score) were then compared and prioritized using the set of criteria outlined below (PEMA 2020).

- Effectiveness (20 percent of score) – The extent to which an action reduces the vulnerability of people and property.
- Efficiency (30 percent of score) – The extent to which time, effort, and cost is well used as a means of reducing vulnerability. This criterion assesses the benefits of an action versus the cost of the action’s implementation.
- Multi-Hazard Mitigation (20 percent of score) – The action reduces vulnerability for more than one hazard.
- Addresses High-Risk Hazard (15 percent of score) – The action reduces vulnerability for people and property from a hazard(s) identified as high-risk.
- Addresses Critical Communications/Critical Infrastructure (15 percent of score) – The action pertains to the maintenance of critical functions and structures, such as transportation, supply chain management, data circuits, etc.

Scores in each criterion range from 0 to 3. The action’s priority is determined by using a formula based on the criteria values and weights. Priority values also range from 0 to 3. An action’s priority is then determined using the following scale (PEMA 2020):

- Low priority = 0 – 1.8
- Medium priority = 1.9 – 2.4
- High priority = 2.5 – 3

Table 6-6 shows the prioritization scores for the identified, feasible mitigation actions. Municipal officials reviewed and updated the prioritization values based on local needs.



Table 6-6. Prioritization Scoring of Mitigation Actions

Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ChesterC-1	As opportunities arise, elevate, or acquire properties within flood-prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	3	2	1	3	3	2.3
ChesterC-2	Coordinate utilization of privately-owned digital billboards for emergency usages	2	2	1	3	3	2.1
ChesterC-3	Create a website to assist landowners and municipalities to navigate FEMA resources	2	2	1	2	3	2.0
ChesterC-4	Develop a countywide Debris Management Plan	2	2	1	2	0	1.5
ChesterC-5	Develop a plan to stagger traffic and implement delays/early releases for schools, government, and private sector during a disaster	3	3	1	2	3	2.5
ChesterC-6	Develop an outreach and awareness program and provide to municipalities, where residents and potential homeowners could access to identify any risks they might have to address	3	2	2	1	1	1.9
ChesterC-7	Develop and implement a model natural conservation ordinance for municipal adoption	3	2	1	3	3	2.3
ChesterC-8	Educate county residents on the NFIP following flood events	3	2	1	3	3	2.3
ChesterC-9	Educate the public on all the hazards they face	3	2	2	1	1	1.9
ChesterC-10	Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	1	1	1	2	2	1.3
ChesterC-11	Encourage municipalities to adopt an ordinance outlining the process to implement a snow emergency declaration	3	2	2	1	1	1.9
ChesterC-12	Encourage municipalities to require radon testing at the time sale of homes	3	2	2	1	1	1.9
ChesterC-13	Encourage new development planning to include burying of utility cables	2	2	1	3	3	2.1
ChesterC-14	Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	3	2	1	3	3	2.3
ChesterC-15	Enhance the household hazard waste program to reduce post-event hazardous debris	2	2	1	2	0	1.5
ChesterC-16	Ensure that the county has a COOP/COG Plan and procedures in place for off-site hazmat releases that can affect the buildings.	2	2	1	2	0	1.5
ChesterC-17	Ensure that the municipal EMAs have COOP/COG plans	2	2	1	2	0	1.5
ChesterC-18	Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents	3	2	2	1	1	1.9
ChesterC-19	Improve storm drains throughout the county to handle snow melt	3	2	1	3	3	2.3
ChesterC-20	Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	3	2	1	3	3	2.3
ChesterC-21	Increase cell coverage and telecommunications bandwidth in areas with poor coverage	2	2	2	2	3	2.2
ChesterC-22	Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	2	2	1	2	0	1.5
ChesterC-23	Install back-up power sources for traffic signals (generator, battery, solar)	2	2	1	3	3	2.1
ChesterC-24	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	3	2	1	3	3	2.3
ChesterC-25	Investigate the interaction of public agencies and camera data from private companies/citizens	1	2	1	1	2	1.5



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ChesterC-26	Plan for replenishment fuel for generators	2	2	1	3	3	2.1
ChesterC-27	Plant bushes/other vegetation to stop drifting snow in known problem areas	3	2	2	1	1	1.9
ChesterC-28	Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.	3	2	1	3	3	2.3
ChesterC-29	Provide education to the municipalities on flood gauges.	3	2	1	3	3	2.3
ChesterC-30	Provide education to the municipalities on resident evacuation processes and need	3	2	2	1	1	1.9
ChesterC-31	Provide public education on traffic accident reduction	3	3	1	2	3	2.5
ChesterC-32	Provide public information on debris management	2	2	1	2	0	1.5
ChesterC-33	Purchase backup generators for critical infrastructure/key resources	2	2	1	3	3	2.1
ChesterC-34	Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	3	2	1	3	3	2.3
ChesterC-35	Retrofit critical public facilities with safe rooms	3	3	1	2	3	2.5
ChesterC-36	Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	3	2	1	3	3	2.3
ChesterC-37	Sustain tree management programs around power lines	2	2	1	3	3	2.1
ChesterC-38	The county and all municipalities will work with their major businesses to ensure they have continuity plans in place.	2	2	1	2	0	1.5
ChesterC-39	The county and all municipalities with a dam will work with dam operators to ensure they are protected to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
ChesterC-40	The county and municipalities will work with the higher education facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	3	3	1	3	3	2.6
ChesterC-41	The county and municipalities will work with the intermediate care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	3	3	1	3	3	2.6
ChesterC-42	The county and municipalities will work with the long-term care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	3	3	1	3	3	2.6
ChesterC-43	The county and municipalities will work with the senior living facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	3	3	1	3	3	2.6
ChesterC-44	The county will assess their bridges to determine what measures can be taken to protect them to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
ChesterC-45	The county will work with all municipalities that have a child care facility exposed to any of the hazards to work with the child care facility operators to discuss hazards they face and ensure their emergency plans address those hazards	3	3	1	3	3	2.6
ChesterC-46	Update countywide Model Stormwater Ordinance	2	2	1	2	0	1.5
ChesterC-47	When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	3	2	1	3	3	2.3
ChesterC-48	Work with district courts to ensure they have plans in place for off-site hazmat releases that can affect the courts.	3	2	1	3	3	2.3



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ChesterC-49	Work with hazmat facilities to inform them of the hazards they face and ensure emergency plans are current.	3	2	1	3	3	2.3
ChesterC-50	Work with hospitals to ensure they have plans in place for off-site hazmat releases that can affect hospitals.	3	2	1	3	3	2.3
ChesterC-51	Work with schools and school districts to inform them of the hazards they face and ensure emergency plans are current.	3	3	1	3	3	2.6
ChesterC-52	Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	3	2	1	3	3	2.3
ChesterC-53	Work with the railroad industry to address safety concerns and aging rail infrastructure	2	2	1	2	0	1.5
ChesterC-54	Work with the USPS on options for protecting the post offices from flooding and possible inundation from dam failure.	3	3	1	3	3	2.6
ChesterC-55	Work with Verizon to protect the facilities from flood or dam failure.	3	2	1	3	3	2.3
ChesterC-56	Educate the public about resources available to combat the opioid abuse/addiction.	2	2	2	3	3	2.3
ChesterC-57	Improve telecommunications infrastructure, including accessibility of high-speed Internet connectivity, throughout the county	2	3	2	3	3	2.6
AtglenB-1	The municipal FPA will work with the Atglen Borough Sewer Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	2	1	3	3	2.3
AtglenB-2	Work with the property owner to determine what flood protection measures can be taken to protect the structure to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
AvondaleB-1	The municipal FPA will work with the Avondale Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	2	1	3	3	2.3
BirminghamT-1	Build an access road to Masters Way to Webb Rd	2	2	1	3	1	1.8
BirminghamT-2	Work with PennDOT to reengineer intersection at Street Road (PA 926) bridge over Brandywine Creek	2	2	1	3	1	1.8
BirminghamT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Brinton's Mill, Lenape Bridge, and Painter, Joseph, Farm	3	2	1	3	3	2.3
CalnT-1	Acquire/Elevate the building located on 135 Seltzer Road	2	2	1	3	1	1.8
CalnT-2	Caln Township has major businesses that are vulnerable to dam failure and will work with management to protect the buildings.	3	3	1	3	3	2.6
CalnT-3	Protect the Caln Radio Tower to the 0.2% annual chance flood level and from a potential dam failure.	3	2	1	3	3	2.3
CalnT-4	Work with Downingtown Middle School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	3	2	1	3	3	2.3
CharlestownT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pennsylvania Railroad Bridge (No.205), Pickering Dam	3	2	1	3	3	2.3
CoatesvilleC-1	Emergency Alert System	3	2	3	3	2	2.6
CoatesvilleC-2	Install gates to be closed during flood incidents and signage at 11th Avenue and railroad underpass	2	2	0	2	0	1.3
CoatesvilleC-3	West End Fire Station Generator	3	2	3	3	3	2.7
CoatesvilleC-4	Protect ArcelorMital Emergency Services to the 0.2% annual chance flood level.	3	2	1	3	3	2.3



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
CoatesvilleC-5	Gibbons Run Culvert Flooding and Structural Stability	3	2	2	3	3	2.5
CoatesvilleC-6	The municipal FPA will work with the Martin-Brower facility owner/operator to protect the facility to the 0.2% annual chance flood level and dam failure.	3	2	1	3	3	2.3
CoatesvilleC-7	Upgrade City Hall Command Center	3	2	3	3	3	2.7
CoatesvilleC-8	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: High Bridge, Huston, Abram, House & Carriage House, Lukens Main Office Building	3	2	1	3	3	2.3
CoatesvilleC-9	Amtrak Keystone Corridor Underpass Flooding	3	3	2	3	3	2.8
CoatesvilleC-10	S. 5th Avenue Stormwater Improvements	3	3	2	3	2	2.7
CoatesvilleC-11	63 S. 5th Ave. Property Protection - protect the existing grocery store on the corner of Olive St. and S 5th Ave.	3	2	2	3	3	2.5
CoatesvilleC-12	Pre-Plan Emergency Access Routes	2	3	3	3	2	2.7
CoatesvilleC-13	Ash Park Stormwater Improvements - improve infiltration and mitigate floodwaters that pose a threat for travelers during/after storm events.	3	3	2	3	2	2.7
CoatesvilleC-14	Downtown Stormwater Improvements - upgrade Coatesville's existing stormwater infrastructure in the downtown business district	3	3	2	3	3	2.8
CoatesvilleC-15	Millview Basin - restore proper stormwater detention basin function with added water quality improvements	3	3	2	3	2	2.7
CoatesvilleC-16	Public Information Programs - develop education packages, classes, meetings, programs, etc. with the goal of improving public knowledge of potential hazards within the City and how these hazards are dealt with.	2	2	3	3	1	2.2
CoatesvilleC-17	Create a Capital Improvements Plan	2	2	3	3	3	2.5
CoatesvilleC-18	Provide backup power at the City's traffic signals, including developing a plan for implementation and refueling.	2	2	2	3	3	2.3
CoatesvilleC-19	Route 82 Slope Stability - ensure the stability of the slopes along the eastern side of Route 82 in order to maintain unimpeded direct access into and out of the City.	3	2	2	3	3	2.5
DowningtwnB-1	Determine the specific vulnerability of the Downingtown Borough Building to dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
DowningtwnB -2	Downingtwn Borough has major businesses that are vulnerable to dam failure and will work with management to protect the buildings	3	3	1	3	3	2.6
DowningtwnB -3	Protect Alert FC Fire Station from dam failure.	3	3	1	3	3	2.6
DowningtwnB -4	Protect Downingtown - Jefferson Ave Electrical Substation to the 0.2% annual chance flood level and from the vulnerability to dam failure.	3	3	1	3	3	2.6
DowningtwnB-5	Protect Downingtown Boro PD from potential dam failure.	3	3	1	3	3	2.6
DowningtwnB-6	Protect Minquas Ambulance Fire Station from dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
DowningtwnB-7	Protect Minquas FC from potential dam failure.	3	3	1	3	3	2.6
DowningtwnB-8	Protect the Downingtown Municipal Waste from dam failure.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
DowningtowntownB-9	The municipal FPA will work with AT&T Mobility Downingtowntown - USID53712 facility owner/operator to protect the facility from its vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-10	The Municipal FPA will work with the Downingtowntown Municipal Water Authority owner/operator to the 0.2% annual chance flood level and from vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-11	The municipal FPA will work with the Inland Flexo, LLC facility owner/operator to protect the facility from its vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-12	The municipal FPA will work with the Johnson Matthey AGT facility owner/operator to protect the facility from vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-13	The municipal FPA will work with the Verizon Downingtowntown CO owner/operator to protect the facility from vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-14	The municipal FPA will work with the Victory Brewing Company, LLC owner/operator to protect the facility from vulnerability to dam failure.	3	2	1	3	3	2.3
DowningtowntownB-15	Work with Beaver Creek Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
DowningtowntownB-16	Work with Downingtowntown High School West to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-17	Work with East Ward Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-18	Work with Lori Petrie's Pre School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-19	Work with Regina Luminis Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-20	Work with SEPTA and Amtrak to protect the station from dam failure	3	3	1	3	3	2.6
DowningtowntownB-21	Work with St. Joseph School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
DowningtowntownB-22	Work with STEM Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-23	Work with Step by Step Children's House to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	3	3	1	3	3	2.6
DowningtowntownB-24	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect the, to the 0.2% annual chance flood level and vulnerability to dam failure: Downingtowntown Log House, Hunt, Roger, and Mill Complex	3	3	1	3	3	2.6
DowningtowntownB-25	Work with the United States Marine Recruiting Office to protect the structure from the vulnerabilities of dam failure.	3	3	1	3	3	2.6
EastBradfordT-1	Acquisition/elevation of structure at 414 Cottage Lane	2	3	1	3	0	2.0
EastBradfordT-2	Acquisition/elevation of structure located at 402 Cottage Lane	2	3	1	3	0	2.0
EastBradfordT-3	Acquisition/elevation of structure located at 406 Cottage Lane	2	3	1	3	0	2.0
EastBradfordT-4	Acquisition/elevation of structure located at 418 Cottage Lane	2	3	1	3	0	2.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EastBradfordT-5	Acquisition/Elevation of structure located at 502 River Bed Lane	2	3	1	3	0	2.0
EastBradfordT-6	Acquisition/Elevation of structure located at 530 River Bend Lane	2	3	1	3	0	2.0
EastBradfordT-7	Acquisition/Elevation of structure located at 550 River Bend Lane	2	3	1	3	0	2.0
EastBradfordT-8	Acquisition/Elevation of structure located at 558 River Bend Lane	2	3	1	3	0	2.0
EastBradfordT-9	Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Nields Street	2	2	1	3	3	2.1
EastBradfordT-10	Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road	2	2	0	2	0	1.3
EastBradfordT-11	Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road	2	2	0	2	0	1.3
EastBradfordT-12	Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way	2	2	0	2	0	1.3
EastBradfordT-13	Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road	2	2	0	2	0	1.3
EastBradfordT-14	Municipal FPA to work with the Aqua Ingrams Mill Plant facility owner/operator to protect the facility from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
EastBradfordT-15	Property protection of structure located at 1010 Valley Creek Road	2	3	1	3	0	2.0
EastBradfordT-16	Protect East Bradford Electrical Substation from vulnerability to dam failure.	3	3	1	3	3	2.6
EastBradfordT-17	Protect Good Fellowship Ambulance (Sub-Station) from the vulnerabilities from dam failure.	3	3	1	3	3	2.6
EastBradfordT-18	The municipal FPA to work with the PECO Bradford Substation facility owner/operator to protect the facility from vulnerabilities to dam failure.	3	3	1	3	3	2.6
EastBradfordT-19	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cope's Bridge, East Bradford Historic District- HDA, Gibson's Covered Bridge, Hance, Joseph, House & Barn, Hannum, Col. John House, Jefferis Ford Bridge, Paradise Valley Historic District, Strode's Mill, Strode's Mill Historic District, and Taylor-Cope Historic District	3	3	1	3	3	2.6
EastBrandywineT-1	Acquire/elevate structure at 745 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-2	Acquire/elevate structure at 755 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-3	Acquire/elevate structure at 765 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-4	Acquire/elevate structure at 775 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-5	Acquire/elevate structure at 785 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-6	Beaver Creek Dam Rehabilitation Project	3	3	1	3	3	2.6
EastBrandywineT-7	Increase size of culvert crossing at 2069 Bondsville Road	2	2	1	3	1	1.8
EastBrandywineT-8	Install a flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road	2	2	0	2	0	1.3
EastBrandywineT-9	Install generator connection at East Brandywine Baptist Church	2	2	1	3	3	2.1
EastBrandywineT-10	Install generator connection at Hopewell United Methodist Church	2	2	1	3	3	2.1



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EastBrandywineT-11	Property protection of structure located at 1051 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-12	Property protection of structure located at 1061 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-13	Property protection of structure located at 1081 Creek Road	2	3	1	3	0	2.0
EastBrandywineT-14	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Bridge Mill Farm, Dowlin Farm, and Marshall's Bridge	3	3	1	3	3	2.6
EastCalnT-1	Determine the specific vulnerability to dam failure and determine appropriate mitigation measures for the Downingtown Sewer Authority	3	3	1	3	3	2.6
EastCalnT-2	The municipal FPA to work with the D.R.W.P.C.C facility owner/operator to protect the facility from vulnerabilities to flooding.	3	3	1	3	3	2.6
EastCoventryT-1	Acquisition/elevation of structure located at 285 Linfield Road	2	3	1	3	0	2.0
EastCoventryT-2	Install emergency alerting systems for East Coventry Township	1	1	1	1	1	1.0
EastCoventryT-3	Project East Coventry - Linfield Road Electrical Substation from the vulnerabilities of dam failure.	3	3	1	3	3	2.6
EastCoventryT-4	The municipal FPA to work with Taylor Industries Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	3	3	1	3	3	2.6
EastCoventryT-5	Work with the property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
EastFallowfieldT-1	Improve drainage to reduce flooding along Mortonville Road including intersection of Mortonville Road and Sawmill Road	2	2	1	3	1	1.8
EastFallowfieldT-2	Improve drainage to reduce flooding on Timacula Road	2	2	1	3	1	1.8
EastFallowfieldT-3	Protect East Fallowfield - Spring Dell Road Electrical Substation to the 0.2% annual chance flood event	3	3	1	3	3	2.6
EastFallowfieldT-4	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Strasburg Rd Bridge, Speakman No.2, and the Gorden Farm	3	3	1	3	3	2.6
EastGoshenT-1	Work with the Goodwin Acres owner to determine what protection measures can be taken to protect them from vulnerabilities to dam failure.	3	3	1	3	3	2.6
EastMarlboroughT-1	Emergency alerting systems for East Marlborough Township	1	1	1	1	1	1.0
EastPikelandT-1	Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	2	2	1	3	3	2.1
EastPikelandT-2	Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	2	2	1	1	0	1.4
EastPikelandT-3	Plant bushes/other vegetation to stop drifting snow in known problem areas	1	1	1	1	1	1.0
EastPikelandT-4	Purchase temporary mobile camera to set up for events and use to monitor safety and security	1	1	1	0	0	0.7
EastPikelandT-5	Retrofit critical public facilities with safe rooms	3	3	1	2	3	2.5
EastPikelandT-6	The municipal FPA to work with the Cromby Generating Station facility owner/operator to protect the facility to at least the 0.2% chance flood level and from vulnerabilities to dam failure.	3	3	1	3	3	2.6
EastPikelandT-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and vulnerabilities to dam failure:	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	Bernard Property, Hare's Hill Road Bridge, Hartman, Peter, Residence, Kimberton Historic District, and Rapp's Covered Bridge						
EastPikelandT-8	Work with the railroad industry to address safety concerns and aging rail infrastructure	2	2	1	2	0	1.5
EastVincentT-1	Protect the Shady Lane Water Treatment Plant from dam failure	3	3	1	3	3	2.6
EastVincentT-2	The municipal FPA to work with the Columbia Gas Transmission/Birdsboro Heater facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities of potential dam failure.	3	3	1	3	3	2.6
EastVincentT-3	The municipal FPA to work with the Oehlert Bros., Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
EastVincentT-4	The municipal FPA to work with the Shady Lane Plant-Royersford facility owner/operator to protect the facility from the vulnerabilities of dam failure	3	3	1	3	3	2.6
EastVincentT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Kennedy Covered Bridge and Parker's Ford	3	3	1	3	3	2.6
EastWhitelandT-1	Increase stormwater pipe size at Hillbrook Circle	3	3	1	3	1	2.3
EastWhitelandT-2	Install a generator at the Meadowview pump station	2	2	1	3	3	2.1
EastWhitelandT-3	Install a generator at the pump station on Flat Road	2	2	1	3	3	2.1
EastWhitelandT-4	Install gates to be closed during flood incidents and signage at Church Road	2	2	0	2	0	1.3
EastWhitelandT-5	Install gates to be closed during flood incidents and signage at Old Morehall Road	2	2	0	2	0	1.3
EastWhitelandT-6	Work with management of major businesses to protect the buildings to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EastWhitelandT-7	Work with the Spring Mill Complex owner to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood event.	3	3	1	3	3	2.6
EasttownT-1	Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed	2	2	1	3	1	1.8
EasttownT-2	Work with Sugartown Road Bridge owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level	3	3	1	3	3	2.6
ElkT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Glen Hope Covered Bridge, Rudolph & Arthur Covered Bridge, and Stephens, Linton Covered Bridge	3	3	1	3	3	2.6
FranklinT-1	Clear out blocked inlets at 896 between Goodhope Road and Gypsey Hill	2	2	1	3	1	1.8
FranklinT-2	Divert water on 512 Chesterville Road during heavy rain events	2	2	1	3	1	1.8
FranklinT-3	Improve drainage on North Clay Creek and Churchill Road	2	2	1	3	1	1.8
FranklinT-4	Improve drainage to reduce flooding at Green Bridge on Strickersville Road and Appleton Road	2	2	1	3	1	1.8
HoneyBrookB-1	Work with PennDOT to improve US-322 corridors to mitigate traffic accidents	3	3	1	2	3	2.5
HoneyBrookT-1	The municipal FPA to work with the Honey Brook Borough Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level.	3	3	1	3	3	2.6
KennettSquareB-1	Improve drainage on East South Street between S Walnut and Broad Street to prevent flooding	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
KennettSquareB-2	Improve drainage on South Street at Lafayette and Grant Way	2	2	1	3	1	1.8
KennettSquareB-3	Improve drainage on Walnut Street between Birch and East South St	2	2	1	3	1	1.8
KennettSquareB-4	Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St, west of Union St	2	2	1	3	1	1.8
KennettSquareB-5	The municipal FPA will work with Comcast Cable-Kennell Square Hubsite owner/operator to protect the facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
KennettT-1	Acquisition/elevation of structure located at 611 Creek Road	2	3	1	3	0	2.0
KennettT-2	Acquisition/elevation of structure located at 903 Creek Road	2	3	1	3	0	2.0
KennettT-3	Acquisition/elevation of structure located at 909 Creek Road	2	3	1	3	0	2.0
KennettT-4	Assess and determine the best action to prevent East Hillendale Rd from flooding	3	3	1	3	3	1.8
KennettT-5	Assess and determine the best action to prevent flooding of Kaolin Rd from stream	3	3	1	3	3	1.8
KennettT-6	Assess and determine the best action to prevent flooding of Marshall Bridge a Route 82 South	3	3	1	3	3	1.8
KennettT-7	Assess and determine the best action to prevent flooding of the West Hillendale stream from Chandler Mill to Scarlet	3	3	1	3	3	1.8
KennettT-8	Assess and determine the best action to prevent further erosion of Bucktoe Road stream banks and prevent flooding of the road	2	2	1	3	1	1.8
KennettT-9	Assess and determine the best action to prevent Rosedale Road stream from overflowing onto the road	3	3	1	3	3	1.8
KennettT-10	Assess and determine the best action to prevent the stream on Center Mill Road from overflowing	3	3	1	3	3	1.8
KennettT-11	Install gates to be closed during flood incidents and signaled at flood intersections within the township	2	2	0	2	0	1.3
KennettT-12	Install warning signs to be utilized during flood incidents at flood-prone bridges within the township	2	2	0	2	0	1.3
KennettT-13	The municipal FPA to work with the AT&T SBA Kennett Square facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
KennettT-14	The municipal FPA to work with the Kennett Square Borough Sewage Treatment Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
KennettT-15	Work with county to improve drainage on Bayard Road	2	2	1	3	1	1.8
KennettT-16	Work with the county to improve drainage on Pemberton Road Bridge from Mill Road to Cedar Springs to prevent flooding	2	2	1	3	1	1.8
KennettT-17	Work with the county to improve drainage on South Street from Scarlet to Chandler Mill	2	2	1	3	1	1.8
LondonBritainT-1	Emergency alerting systems for London Britain Township	1	1	1	1	1	1.0
LondonBritainT-2	Install a snow fence during snow season to prevent snow drifting on South Bank Rd	1	1	1	1	1	1.0
LondonBritainT-3	Install a snow fence during snow season to prevent snow drifting on Strickersville Rd	1	1	1	1	1	1.0
LondonBritainT-4	Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd	2	2	0	2	0	1.3
LondonBritainT-5	Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd	2	2	0	2	0	1.3
LondonBritainT-6	Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd	2	2	0	2	0	1.3
LondonBritainT-7	Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd	2	2	0	2	0	1.3
LondonBritainT-8	Install gates to be closed during flood incidents and signage at Yeatmans Station Rd	2	2	0	2	0	1.3



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LondonGroveT-1	Emergency alerting systems/public notification system for London Grove Township	1	1	1	1	1	1.0
LondonGroveT-2	Install alerting system/public notification system to profiteering/notification of potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.	1	1	1	1	1	1.0
LondonGroveT-3	Install gates and signage within flood-prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters.	2	2	0	2	0	1.3
LondonGroveT-4	Protect West Grove Sewage Treatment Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LondonGroveT-5	Reconfigure stream channel at Sullivan Rd & Clay Creek Rd	2	2	1	2	0	1.5
LondonGroveT-6	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.	3	3	0	2	2	2.1
LondonGroveT-7	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable until as opposed to three permanent generators providing additional costs savings.	2	2	1	3	3	2.1
LondonGroveT-8	The municipal FPA to work with the West Grove Wastewater Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
LondonGroveT-9	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources	2	2	1	3	1	1.8
LondonGroveT-10	To remove an existing narrow culvert and replace with a structure to span the base flood elevations. Portions or all of the structure removal and replacements could be completed utilizing Municipal Public Works.	2	2	1	3	1	1.8
LondonGroveT-11	Widen bridge and bridge approaches at Indian Run Rd	2	2	1	3	1	1.8
LowerOxfordT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Octoraro Water Company and Pine Grove Covered Bridge	3	3	1	3	3	2.6
LondonderryT-1	Work with PennDOT to clear the brush in roadway lines of sight at Rt 796 and Rt 41	2	2	1	3	1	1.8
LondonderryT-2	Work with PennDOT to construct a roundabout at the intersection of PA Route 41 and PA route 926	2	2	1	2	1	1.7
LondonderryT-3	Emergency alerting systems/public notification system for Londonderry Township	1	1	1	1	1	1.0
LondonderryT-4	Improve and enhance culverts on Jackson Rd and Faggs Manor Rd	2	2	1	3	1	1.8
LondonderryT-5	Improve plans and communication in case of emergency.	2	2	1	2	0	1.5
LondonderryT-6	Increase the height of the bridge at Whitehorse Rd near Creek Rd	2	2	1	3	1	1.8
LondonderryT-7	Install a generator in the Township Building	2	2	1	3	3	2.1
LondonderryT-8	Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station	1	1	1	1	1	1.0
LondonderryT-9	Purchase 2-way radios to assist in communication during emergency events in the township	2	2	1	2	1	1.7
LondonderryT-10	Purchase and install a backup generator at the Municipal Building	2	2	1	3	3	2.1
LondonderryT-11	Work with PennDOT to reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd	3	3	1	2	3	2.5
MalvernB-1	Elevation/Acquisition of structure located at 135 Powelton Ave	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
MalvernB-2	Elevation/Acquisition of structure located at 145 Powelton Ave	2	2	1	3	1	1.8
MalvernB-3	Elevation/Acquisition of structures 10 through 142 W First Ave	2	2	1	3	1	1.8
MalvernB-4	Elevation/Acquisition of structures 193 through 323 Paoli Pike	2	2	1	3	1	1.8
MalvernB-5	Elevation/Acquisition of structures 2 through 10 Remington Ln	2	2	1	3	1	1.8
MalvernB-6	Elevation/Acquisition of structures 217 through 545 S. Warren Ave	2	2	1	3	1	1.8
MalvernB-7	Increase culvert size at 313 S Warren Ave	2	2	1	3	1	1.8
MalvernB-8	Work with management of Malvern Preparatory School to protect the buildings to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ModenaB-1	Determine the specific vulnerability of the Modena Borough Building to dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
ModenaB-2	Protect Modena Ambulance EMS Station from vulnerabilities to dam failure.	3	3	1	3	3	2.6
ModenaB-3	Protect Modena FC Fire Station from a potential dam failure.	3	3	1	3	3	2.6
ModenaB-4	The Municipal FPA will work with the Mahoney-Modena owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
ModenaB-5	The Municipal FPA will work with the Sealed Air Corporation owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerability from dam failure.	3	3	1	3	3	2.6
ModenaB-6	Work with the Mode Paper Mill owner to determine what flood protection measures can be taken to protect it from the vulnerabilities of dam failure.	3	3	1	3	3	2.6
NewlinT-1	Determine the specific vulnerability of the Newlin Township Building to dam failure and determine appropriate mitigation measures.	3	3	1	3	3	2.6
NewlinT-2	Fix and pave road that has been destroyed on Laurel Road including three driveways	3	3	1	2	3	2.5
NewlinT-3	Protect the Embreeville Sewage Treatment from dam failure and protect it to the 0.2% annual chance flood event and from vulnerabilities to dam failure.	3	3	1	3	3	2.6
NewlinT-4	Replant Ash Trees that were lost to the Ash Borer and determine the best actions to prevent invasive species in the future	2	3	1	1	3	2.1
NewlinT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Embreeville Historic District, House at Upper Laurel Iron Works, Marlborough Village Historic District, Spruce Groce School House, Worker's House at Lower Laurel Iron Works	3	3	1	3	3	2.6
NewGardenT-1	Construct larger culvert at Cedar Springs Rd at Pemberton Rd	2	2	1	3	1	1.8
NewGardenT-2	Construct larger culvert at Egypt Run Road	2	2	1	3	1	1.8
NewGardenT-3	Emergency alerting systems for New Garden Township	1	1	1	1	1	1.0
NewGardenT-4	Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike	2	2	1	3	3	2.1
NewGardenT-5	Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike	2	2	1	3	3	2.1
NewGardenT-6	Purchase portable generator for traffic signal at Newark Rd and Rt 41	2	2	1	3	3	2.1
NewGardenT-7	Purchase portable generator for traffic signal at Penn Green Rd and Rt 41	2	2	1	3	3	2.1
NewGardenT-8	Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike	2	2	1	3	3	2.1



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
NewGardenT-9	Purchase portable generator for traffic signal at Southwood Rd and Rt 7	2	2	1	3	3	2.1
NewGardenT-10	Work with To-jo Mushrooms Inc. management to protect the building to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
NorthCoventryT-1	Protect the North Coventry Municipal Authority from dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
NorthCoventryT-2	The municipal FPA to work with the North Coventry Municipal Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	3	3	1	3	3	2.6
NorthCoventryT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Schuylkill Navigation Company Canal and historic structure located on SR 7046	3	3	1	3	3	2.6
OxfordB-1	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8th Street.	1	1	1	1	1	1.0
ParkesburgB-1	The municipal FPA will work with the Hayes Heating and Cooling Bulk owner/operator to protect the facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParkesburgB-2	Work with power company to protect Parkesburg - N Church St Electrical Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennT-1	Enhance stormwater management regulations	1	1	1	2	2	1.3
PennT-2	Work with power company to protect Penn - Neward Road Electrical Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennsburyT-1	Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd	2	2	0	2	0	1.3
PennsburyT-2	Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek	2	2	0	2	0	1.3
PennsburyT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Bissel/Hill Girt/Beverly Rural Historic District and Delaware Boundary Makers.	3	3	1	3	3	2.6
PhoenixvilleB-1	Improve drainage at the intersection of Bridge and Church St.	2	2	1	3	1	1.8
PhoenixvilleB-2	Protect the District Court 15-2-01 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PhoenixvilleB-3	Protect the Phoenixville Boro PD to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PhoenixvilleB-4	Protect the Phoenixville Water Treatment to the 0.2% annual chance flood event and from dam failure.	3	3	1	3	3	2.6
PhoenixvilleB-5	The municipal FPA to work with the Phoenixville Water Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
PhoenixvilleB-6	Work with the management of major businesses to protect the buildings from dam failure and to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
PhoenixvilleB-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Black Rock Bridge, Lobok, John, Property, Mansion House, and Phoenixville Canal Spur	3	3	1	3	3	2.6
PocopsonT-1	Assess and determine the best action to prevent flooding around Brandywine Creek on Northbrook Road, one lane historical bridge	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
PocopsonT-2	Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding	2	2	1	2	0	1.5
PocopsonT-3	The municipal FPA to work with the Lenape Forged Products Corp facility owner/operator to protect the facility from the vulnerabilities of dam failure.	3	3	0	3	3	2.4
PocopsonT-4	Work with power company to protect the Pocopson - Lenape Unionville Road Electrical Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PocopsonT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pocopson Station, State Route 3027, and Wilkinson House	3	3	1	3	3	2.6
SadsburyT-1	Assess and determine the best action to improve drainage and reduce flooding on Greenbelt Drive	2	2	1	3	1	1.8
SadsburyT-2	Install gates to be closed during flood incidents and signage on sections of Old Mill Road	2	2	0	2	0	1.3
SchuylkillT-1	Acquisition/Elevation of the structure located at 493 State Creek Road	2	2	1	3	1	1.8
SchuylkillT-2	Construct Larger Culvert at East Phillip Drive	2	2	1	3	1	1.8
SchuylkillT-3	Construct larger culvert at S Whitehorse Road	2	2	1	3	1	1.8
SchuylkillT-4	Determine specific vulnerability to dam failure and determine appropriate mitigation measures for the Valley Forge Sewage Treatment Plant	3	3	1	3	3	2.6
SchuylkillT-5	Plant bushes/other vegetation to stop drifting snow in known problem areas	1	1	1	1	1	1.0
SchuylkillT-6	Protect Structure with Barrier at Creek Road Bridge	2	2	1	3	1	1.8
SchuylkillT-7	Retrofit critical public facilities with safe rooms	3	3	1	2	3	2.5
SchuylkillT-8	The municipal FPA to work with the Aqua Pickering Water Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
SchuylkillT-9	The municipal FPA to work with the Valley Forge Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
SchuylkillT-10	Work with power company to protect Schuylkill - Valley Forge Road to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SchuylkillT-11	Work with YMCA management to protect the building to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SouthCoatesvilleB-1	Investigate stormwater management options and identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents throughout South Coatesville Borough	2	2	1	3	1	1.8
SouthCoatesvilleB-2	Protect the Coatesville Sewer Authority from dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SouthCoatesvilleB-3	The municipal FPA will work with the Scrap Metal Services owner/operator to protect the facility to the 0.2% annual chance level.	3	3	1	3	3	2.6
SouthCoventry-1	Construct larger culvert at Bealor Road	2	2	1	3	1	1.8
SouthCoventry-2	Determine the best action to prevent downhill flooding on Coventryville Rd & Harmonyville Road, close to North Cov. Border	2	2	1	3	1	1.8
SouthCoventry-3	Install flood water collection boxes and piping on Schoolhouse Road and Porter's Mill Road	2	2	0	2	0	1.3
SouthCoventry-4	Purchase and install a backup generator for the Woodridge Sewer Plant at 190 Ridgeview Drive	2	2	1	3	3	2.1



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
SouthCoventry-5	Work with power company to protect South Coventry - Porters Mill Road Electrical Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SouthCoventry-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Coventryville Historic District and Coventryville Historic District (1975)- HDA	3	3	1	3	3	2.6
SpringCityB-1	Protect the Spring City Sewer Plan from the vulnerably to dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SpringCityB-2	The municipal FPA will work with the Hydromotion owner/operator to protect the facility from the vulnerabilities of dam failure	3	3	1	3	3	2.6
SpringCityB-3	Work with management of major businesses to protect the buildings from the vulnerably to dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SpringCityB-4	Work with the Textile Mill owner to determine what flood protection measures can be taken to protect the facility from the vulnerabilities from dam failure	3	3	1	3	3	2.6
ThornburyT-1	Work with PennDOT to conduct an assessment of flood-prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd	1	1	0	2	0	0.8
ThornburyT-2	Install gates to be closed during flood incidents and signage at Rt 926 and Creek Road	2	2	0	2	0	1.3
ThornburyT-3	Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd	2	2	0	2	0	1.3
ThornburyT-4	Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd	2	2	0	2	0	1.3
ThornburyT-5	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd north of Railroad Bridge	2	2	0	2	0	1.3
ThornburyT-6	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge	2	2	0	2	0	1.3
ThornburyT-7	Work with power company to protect Thornbury - Westtown Road Electrical Substation to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	3	3	1	3	3	2.6
TredyffrinT-1	Clogged inverts throughout the township causing flooding	2	2	1	3	1	1.8
TredyffrinT-2	Improve drainage to reduce flooding on Hadwick Road and Upper Weedly Road	2	2	1	3	1	1.8
TredyffrinT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cedar Hollow Industrial Track: Bridge, County Bridge No. 171, Great Valley Mill, Jerman, Thomas, Property, and historic structure on SR 7015	3	3	1	3	3	2.6
TredyffrinT-4	Improve drainage to reduce flooding on Wills Lane, Woodcrest Drive, and Saunders Drive	2	2	1	3	1	1.8
UpperUwchlanT-1	Acquisition/elevation of the structure located at 2 Kiloran Wynd	2	3	1	3	0	2.0
UpperUwchlanT-2	Acquisition/elevation of the structure located at 80 Saint Andrews Ln	2	3	1	3	0	2.0
UpperUwchlanT-3	Protect Larkins Bridge with barrier	2	2	1	3	1	1.8
UpperUwchlanT-4	Protect structure with barrier on Dorothy Lane	2	2	1	3	1	1.8
UpperUwchlanT-5	Protect structure with barrier on Font Road	2	2	1	3	1	1.8
UpperUwchlanT-6	Protect structure with barrier on Lyndell Road	2	2	1	3	1	1.8
UpperUwchlanT-7	Protect structure with barrier on Moore Road and Turnstone Way	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
UpperUwchlanT-8	Protect structure with barrier on St Andrews Lane	2	2	1	3	1	1.8
UpperUwchlanT-9	Protect Windsor Schoolhouse with barrier	2	2	1	3	1	1.8
UpperUwchlanT-10	Raise Fellowship Road roadway at Red Bone Road	2	2	1	3	1	1.8
UpperUwchlanT-11	Stormwater culvert and basin re-sizing on Greenridge Road	2	2	1	3	1	1.8
UpperUwchlanT-12	Stormwater culvert and basin re-sizing on Krauser Rd	2	2	1	3	1	1.8
ValleyT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from vulnerabilities to dam failure: County Bridge No. 101 and Scott Farm Property	3	3	1	3	3	2.6
ValleyT-2	Assess and determine the best action to protect Wagontown Road near the West Branch of the Brandywine Creek, and implement the action.	3	2	3	3	3	2.7
ValleyT-3	Assess drainage into Sucker Run near South Park Avenue and PA-372 to identify the best action to prevent flooding during heavy rainfall events, and implement the action.	2	2	1	3	2	2.0
WallaceT-1	Protect Glenmoore FC Fire Station from a potential dam failure	3	3	1	3	3	2.6
WallaceT-2	The municipal FPA to work with the Verizon Glenmoore ESS Bldg. facility owner/operator to protect the facility from the vulnerabilities to dam failure	3	3	1	3	3	2.6
WallaceT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Glenmoore Historic District and Steels Bridge	3	3	1	3	3	2.6
WarwickT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Hockley Mill Farm, Knauer Patent Thematic District, North Warwick Historic & Archaeological District (HDA), North Warwick HDA, and historic structure located on SR 7015	3	3	1	3	3	2.6
WestBradfordT-1	Acquire and install back-up generator at Wastewater Treatment Plant	2	2	1	3	3	2.1
WestBradfordT-2	Improve drainage on Broad Run Road between Beacon Hill	2	2	1	3	1	1.8
WestBradfordT-3	Install 4 gates to be closed during flood incidents and signage at Downingtown Pike between Harmony Hill Rd and Skelp Level Rd	2	2	0	2	0	1.3
WestBradfordT-4	Protect the Broad Run Sewage Treatment Plant from dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WestBradfordT-5	Work with the management of Ram-t Construction Specialist to protect the buildings from dam failure.	3	3	1	3	3	2.6
WestBradfordT-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Derbydown Homestead, Northbrook Historic District, Pennsylvania Railroad: Morrisville Lien: Viaduct	3	3	1	3	3	2.6
WestBrandywineT-1	Work with the Grow, James, House property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WestChesterB-1	Obtain a backup generator for Goodwill Fire Company	2	2	1	3	3	2.1
WestChesterB-2	The municipal FPA to work with the National Foam facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6





Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WestFallowfieldT-1	Work with the Ross Fording Road Bridge property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WestGoshenT-1	Improve culvert at 103 Oak Lane	2	2	1	3	1	1.8
WestGoshenT-2	Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery	2	2	0	2	0	1.3
WestGoshenT-3	The municipal FPA to work with the A. Duie Pyle PB II Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
WestGoshenT-4	The municipal FPA to work with the A. Duie Pyle Bolmar Street Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
WestGoshenT-5	The municipal FPA to work with the A. Duie Pyle West Chester Truck Terminal facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
WestGoshenT-6	The municipal FPA to work with the Wire and Cable Specialties facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
WestGoshenT-7	Work with the Greystone Hall property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WestMarlboroughT-1	Assess and determine the best actions to prevent flooding on bridges along Rt 82 from Unionville to Coatesville	2	2	1	3	1	1.8
WestMarlboroughT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: House at Springdell, Pennock, Martha House & Industrial Site, and Speakman No.1 Covered Bridge	3	3	1	3	3	2.6
WestNantmealT-1	Work with the Isabella Furnace owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WestNottinghamT-1	Install gates to be closed during flood incidents and signage at Fremont Road between Willow Road and King Pen Road	2	2	0	2	0	1.3
WestNottinghamT-2	Install gates to be closed during flood incidents and signage at Park Road between Veteran's Drive and Sand Hill Road	2	2	0	2	0	1.3
WestPikelandT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Anselma Mill District-HDA, Clinger-Moses Mill Complex, Lightfoot Mill, and Vitale House	3	3	1	3	3	2.6
WestVincentT-1	Backup Generators (2) Acquisition and Installation at Matthews Meadows Sewer Plant	2	2	1	3	3	2.1
WestVincentT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Halls Covered Bridge, Tyson's Bridge, and historic structure on Kimberton Road	3	3	1	3	3	2.6
WestWhitelandT-1	Elevation/acquisition of structure located at 116 N. Locust Lane	2	3	1	3	0	2.0
WestWhitelandT-2	Elevation/acquisition of structure located at 117 N. Locust Lane	2	3	1	3	0	2.0
WestWhitelandT-3	Elevation/acquisition of structure located at 117 Valley Road	2	3	1	3	0	2.0
WestWhitelandT-4	Elevation/acquisition of structure located at 118 Valley Road	2	3	1	3	0	2.0
WestWhitelandT-5	Elevation/acquisition of structure located at 120 Valley Road	2	3	1	3	0	2.0
WestWhitelandT-6	Elevation/Acquisition of structure located at 510 Winding Way	2	3	1	3	0	2.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WestWhitelandT-7	Elevation/acquisition of structure located at 512 Winding Way	2	3	1	3	0	2.0
WestWhitelandT-8	Elevation/acquisition of structure located at 513 Winding Way	2	3	1	3	0	2.0
WestWhitelandT-9	Remove silt/clean Valley Creek bed	2	2	1	3	1	1.8
WestWhitelandT-10	The municipal FPA to work with the Verizon Exton ESS Bldg. facility owner/operator to protect the facility to at least the 0.2% chance flood level	3	3	1	3	3	2.6
WestWhitelandT-11	Work with power company to protect West Whiteland - S Whitford Road Electrical Substation to the 0.2% annual chance flood event.	3	3	1	3	3	2.6
WestWhitelandT-12	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Colebrook Manor, Exton Hotel, Thomas, John Roberts, Tennant Farmstead, Turnpike Station House, Whitford Station House, and William's Deluxe Cabins	3	3	1	3	3	2.6
WesttownT-1	Acquire/elevate roadways/properties along Chester Creek - Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive	2	3	1	3	0	2.0
WesttownT-2	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating invasive species risks.	2	3	1	1	3	2.1
WesttownT-3	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)	2	3	1	1	3	2.1
WesttownT-4	Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.	3	2	2	1	1	1.9
WesttownT-5	Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.	3	2	2	1	1	1.9
WesttownT-6	Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.	3	2	2	1	1	1.9
WesttownT-7	Work with PennDOT to conduct an assessment on how to improve design of Route 352/Rt. 3 intersection	2	2	1	2	0	1.5
WesttownT-8	Work with PennDOT to conduct an assessment to improve the design of Route 202 at 926 intersection and High Street/202 merge	2	2	1	2	0	1.5
WesttownT-9	Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.	3	2	2	1	1	1.9
WesttownT-10	Protect critical infrastructures (Schools, daycare, apartment buildings, and nursing home) on Rt. 202 around Skiles Blvd from HAZMAT transportation accidents	3	3	1	3	3	2.6
WesttownT-11	Protect the following properties from a potential pipeline incident: Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West Chester, PA 19382) . Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352	3	3	1	3	3	2.6
WesttownT-12	Protect the Westtown Wastewater Treatment Plant from dam failure and to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WesttownT-13	Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.	3	2	2	1	1	1.9





Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WesttownT-14	Work with PennDOT to redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge	2	2	1	2	0	1.5
WesttownT-15	Work with PennDOT to redesign the intersection of SR 926 and Avonlea Circle and Tanguy Road to improve line of sight.	2	2	1	2	0	1.5
WesttownT-16	Retrofit WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.	2	3	1	3	0	2.0
WesttownT-17	Work with the County Bridge No. 148 owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Willistown T-1	Elevation/Acquisition of the structure located at 1 Eisenhower Dr	2	3	1	3	0	2.0
Willistown T-2	Elevation/Acquisition of the structure located at 116 Davis Rd	2	3	1	3	0	2.0
Willistown T-3	Emergency alerting systems for Willistown Township	1	1	1	1	1	1.0
Willistown T-4	Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd	2	2	1	3	1	1.8
Willistown T-5	Increase drainage basin size at Rustmont Homeowners Association	2	2	1	3	1	1.8
Willistown T-6	Increase drainage basin size behind Malvern Fire Company	2	2	1	3	1	1.8
Willistown T-7	Increase drainage basin size of the Family Life Basin	2	2	1	3	1	1.8
Willistown T-8	Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd	2	2	1	3	1	1.8
Willistown T-9	Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek	2	2	0	2	0	1.3
Willistown T-10	Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	2	2	0	2	0	1.3
Willistown T-11	Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek	2	2	1	3	1	1.8
Willistown T-12	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd	2	2	1	3	1	1.8
Willistown T-13	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	2	2	1	3	1	1.8



The actions in Table 6-7 are listed in order of priority, with the high-priority actions presented first. This list of actions is the result of the planning effort led by the Planning Team and represents the actions the county and municipalities consider most important. Any actions (including projects) to be implemented will have benefits outweighing their associated costs (i.e., the benefit-cost ratio would be greater than 1).

A blank Mitigation Action Worksheet template is included in Appendix G. The set of completed action worksheets and a table summarizing the worksheets by jurisdiction are presented in Appendix H.

Table 6-7. Prioritized Mitigation Actions

Mitigation Action		Score
High Priority		
CoatesvilleC-9	Amtrak Keystone Corridor Underpass Flooding	2.8
Coatesville C-14	Downtown Stormwater Improvements - upgrade Coatesville's existing stormwater infrastructure in the downtown business district	2.8
CoatesvilleC-3	West End Fire Station Generator	2.7
CoatesvilleC-7	Upgrade City Hall Command Center	2.7
Coatesville C-10	S. 5th Avenue Stormwater Improvements	2.7
Coatesville C-12	Pre-Plan Emergency Access Routes	2.7
Coatesville C-13	Ash Park Stormwater Improvements - improve infiltration and mitigate floodwaters that pose a threat for travelers during/after storm events.	2.7
Coatesville C-15	Millview Basin - restore proper stormwater detention basin function with added water quality improvements	2.7
ValleyT-2	Assess and determine the best action to protect Wagontown Road near the West Branch of the Brandywine Creek, and implement the action.	2.7
ChesterC-40	The county and municipalities will work with the higher education facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	2.6
ChesterC-41	The county and municipalities will work with the intermediate care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	2.6
ChesterC-42	The county and municipalities will work with the long-term care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	2.6
ChesterC-43	The county and municipalities will work with the senior living facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.	2.6
ChesterC-45	The county will work with all municipalities that have a childcare facility exposed to any of the hazards to work with the childcare facility operators to discuss hazards they face and ensure their emergency plans address those hazards	2.6
ChesterC-51	Work with schools and school districts to inform them of the hazards they face and ensure emergency plans are current.	2.6
ChesterC-54	Work with the USPS on options for protecting the post offices from flooding and possible inundation from dam failure.	2.6
ChesterC-57	Improve telecommunications infrastructure, including accessibility of high-speed Internet connectivity, throughout the county	2.6
CalnT-2	Caln Township has major businesses that are vulnerable to dam failure and will work with management to protect the buildings.	2.6
CoatesvilleC-1	Emergency Alert System	2.6
DowningtwnB-1	Determine the specific vulnerability of the Downingtown Borough Building to dam failure and determine appropriate mitigation measures.	2.6
DowningtwnB -2	Downingtwn Borough has major businesses that are vulnerable to dam failure and will work with management to protect the buildings	2.6
DowningtwnB -3	Protect Alert FC Fire Station from dam failure.	2.6
DowningtwnB -4	Protect Downingtown - Jefferson Ave Electrical Substation to the 0.2% annual chance flood level and from the vulnerability to dam failure.	2.6
DowningtwnB-5	Protect Downingtown Boro PD from potential dam failure.	2.6
DowningtwnB-6	Protect Minquas Ambulance Fire Station from dam failure and determine appropriate mitigation measures.	2.6
DowningtwnB-7	Protect Minquas FC from potential dam failure.	2.6
DowningtwnB-8	Protect the Downingtown Municipal Waste from dam failure.	2.6
DowningtwnB-15	Work with Beaver Creek Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	2.6
DowningtwnB-16	Work with Downingtown High School West to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6
DowningtwnB-17	Work with East Ward Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6



Mitigation Action		Score
DowningtowntownB-18	Work with Lori Petrie's Pre School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6
DowningtowntownB-19	Work with Regina Luminis Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6
DowningtowntownB-20	Work with SEPTA and Amtrak to protect the station from dam failure	2.6
DowningtowntownB-21	Work with St. Joseph School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	2.6
DowningtowntownB-22	Work with STEM Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6
DowningtowntownB-23	Work with Step by Step Children's House to determine specific vulnerability to dam failure and determine appropriate mitigation actions.	2.6
DowningtowntownB-24	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect the, to the 0.2% annual chance flood level and vulnerability to dam failure: Downingtowntown Log House, Hunt, Roger, and Mill Complex	2.6
DowningtowntownB-25	Work with the United States Marine Recruiting Office to protect the structure from the vulnerabilities of dam failure.	2.6
EastBradfordT-14	Municipal FPA to work with the Aqua Ingrams Mill Plant facility owner/operator to protect the facility from the vulnerabilities to dam failure.	2.6
EastBradfordT-16	Protect East Bradford Electrical Substation from vulnerability to dam failure.	2.6
EastBradfordT-17	Protect Good Fellowship Ambulance (Sub-Station) from the vulnerabilities from dam failure.	2.6
EastBradfordT-18	The municipal FPA to work with the PECO Bradford Substation facility owner/operator to protect the facility from vulnerabilities to dam failure.	2.6
EastBradfordT-19	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cope's Bridge, East Bradford Historic District- HDA, Gibson's Covered Bridge, Hance, Joseph, House & Barn, Hannum, Col. John House, Jefferis Ford Bridge, Paradise Valley Historic District, Strode's Mill, Strode's Mill Historic District, and Taylor-Cope Historic District	2.6
EastBrandywineT-6	Beaver Creek Dam Rehabilitation Project	2.6
EastBrandywineT-14	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Bridge Mill Farm, Dowlin Farm, and Marshall's Bridge	2.6
EastCalnT-1	Determine the specific vulnerability to dam failure and determine appropriate mitigation measures for the Downingtowntown Sewer Authority	2.6
EastCalnT-2	The municipal FPA to work with the D.R.W.P.C.C facility owner/operator to protect the facility from vulnerabilities to flooding.	2.6
EastCoventryT-3	Project East Coventry - Linfield Road Electrical Substation from the vulnerabilities of dam failure.	2.6
EastCoventryT-4	The municipal FPA to work with Taylor Industries Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	2.6
EastCoventryT-5	Work with the property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	2.6
EastFallowfieldT-3	Protect East Fallowfield - Spring Dell Road Electrical Substation to the 0.2% annual chance flood event	2.6
EastFallowfieldT-4	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Strasburg Rd Bridge, Speakman No.2, and The Gorden Farm	2.6
EastGoshenT-1	Work with the Goodwin Acres owner to determine what protection measures can be taken to protect them from vulnerabilities to dam failure.	2.6
EastPikelandT-6	The municipal FPA to work with the Cromby Generating Station facility owner/operator to protect the facility to at least the 0.2% chance flood level and from vulnerabilities to dam failure.	2.6
EastPikelandT-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and vulnerabilities to dam failure: Bernard Property, Hare's Hill Road Bridge, Hartman, Peter, Residence, Kimberton Historic District, and Rapp's Covered Bridge	2.6
EastVincentT-1	Protect the Shady Lane Water Treatment Plant from dam failure	2.6
EastVincentT-2	The municipal FPA to work with the Columbia Gas Transmission/Birdsboro Heater facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities of potential dam failure.	2.6
EastVincentT-3	The municipal FPA to work with the Oehlert Bros., Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
EastVincentT-4	The municipal FPA to work with the Shady Lane Plant-Royersford facility owner/operator to protect the facility from the vulnerabilities of dam failure	2.6
EastVincentT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Kennedy Covered Bridge and Parker's Ford	2.6



Mitigation Action		Score
EastWhitelandT-6	Work with management of major businesses to protect the buildings to the 0.2% annual chance flood level.	2.6
EastWhitelandT-7	Work with the Spring Mill Complex owner to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood event.	2.6
EasttownT-2	Work with Sugartown Road Bridge owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level	2.6
ElkT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Glen Hope Covered Bridge, Rudolph & Arthur Covered Bridge, and Stephens, Linton Covered Bridge	2.6
HoneyBrookT-1	The municipal FPA to work with the Honey Brook Borough Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level.	2.6
KennettSquareB-5	The municipal FPA will work with Comcast Cable-Kennell Square Hubsite owner/operator to protect the facility to the 0.2% annual chance flood level.	2.6
KennettT-13	The municipal FPA to work with the AT&T SBA Kennett Square facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
KennettT-14	The municipal FPA to work with the Kennett Square Borough Sewage Treatment Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
LondonGroveT-4	Protect West Grove Sewage Treatment Plant to the 0.2% annual chance flood level.	2.6
LondonGroveT-8	The municipal FPA to work with the West Grove Wastewater Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
LowerOxfordT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Octoraro Water Company and Pine Grove Covered Bridge	2.6
MalvernB-8	Work with management of Malvern Preparatory School to protect the buildings to the 0.2% annual chance flood level.	2.6
ModenaB-1	Determine the specific vulnerability of the Modena Borough Building to dam failure and determine appropriate mitigation measures.	2.6
ModenaB-2	Protect Modena Ambulance EMS Station from vulnerabilities to dam failure.	2.6
ModenaB-3	Protect Modena FC Fire Station from a potential dam failure.	2.6
ModenaB-4	The Municipal FPA will work with the Mahoney-Modena owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	2.6
ModenaB-5	The Municipal FPA will work with the Sealed Air Corporation owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerably from dam failure.	2.6
ModenaB-6	Work with the Mode Paper Mill owner to determine what flood protection measures can be taken to protect it from the vulnerabilities of dam failure.	2.6
NewlinT-1	Determine the specific vulnerability of the Newlin Township Building to dam failure and determine appropriate mitigation measures.	2.6
NewlinT-3	Protect the Embreeville Sewage Treatment from dam failure and protect it to the 0.2% annual chance flood event and from vulnerabilities to dam failure.	2.6
NewlinT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Embreeville Historic District, House at Upper Laurel Iron Works, Marlborough Village Historic District, Spruce Groce School House, Worker's House at Lower Laurel Iron Works	2.6
NewGardenT-10	Work with To-jo Mushrooms Inc. management to protect the building to the 0.2% annual chance flood level.	2.6
NorthCoventryT-1	Protect the North Coventry Municipal Authority from dam failure and to the 0.2% annual chance flood level.	2.6
NorthConventryT-2	The municipal FPA to work with the North Coventry Municipal Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure	2.6
NorthCoventryT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Schuylkill Navigation Company Canal and historic structure located on SR 7046	2.6
ParkesburgB-1	The municipal FPA will work with the Hayes Heating and Cooling Bulk owner/operator to protect the facility to the 0.2% annual chance flood level.	2.6
ParkesburgB-2	Work with power company to protect Parkesburg - N Church St Electrical Substation to the 0.2% annual chance flood level.	2.6
PennT-2	Work with power company to protect Penn - Neward Road Electrical Substation to the 0.2% annual chance flood level.	2.6
PennsburyT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Bissel/Hill Girt/Beverly Rural Historic District and Delaware Boundary Makers.	2.6
PhoenixvilleB-2	Protect the District Court 15-2-01 to the 0.2% annual chance flood level.	2.6
PhoenixvilleB-3	Protect the Phoenixville Boro PD to the 0.2% annual chance flood level.	2.6



Mitigation Action		Score
PhoenixvilleB-4	Protect the Phoenixville Water Treatment to the 0.2% annual chance flood event and from dam failure.	2.6
PhoenixvilleB-5	The municipal FPA to work with the Phoenixville Water Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure.	2.6
PhoenixvilleB-6	Work with the management of major businesses to protect the buildings from dam failure and to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	2.6
PhoenixvilleB-7	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Black Rock Bridge, Lobok, John, Property, Mansion House, and Phoenixville Canal Spur	2.6
PocopsonT-4	Work with power company to protect the Pocopson - Lenape Unionville Road Electrical Substation to the 0.2% annual chance flood level.	2.6
PocopsonT-5	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pocopson Station, State Route 3027, and Wilkinson House	2.6
SchuylkillT-4	Determine specific vulnerability to dam failure and determine appropriate mitigation measures for the Valley Forge Sewage Treatment Plant	2.6
SchuylkillT-8	The municipal FPA to work with the Aqua Pickering Water Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
SchuylkillT-9	The municipal FPA to work with the Valley Forge Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
SchuylkillT-10	Work with power company to protect Schuylkill - Valley Forge Road to the 0.2% annual chance flood level.	2.6
SchuylkillT-11	Work with YMCA management to protect the building to the 0.2% annual chance flood level.	2.6
SouthCoatesvilleB-2	Protect the Coatesville Sewer Authority from dam failure and to the 0.2% annual chance flood level.	2.6
SouthCoatesvilleB-3	The municipal FPA will work with the Scrap Metal Services owner/operator to protect the facility to the 0.2% annual chance level.	2.6
SouthCoventry-5	Work with power company to protect South Coventry - Porters Mill Road Electrical Substation to the 0.2% annual chance flood level.	2.6
SouthCoventry-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Coventryville Historic District and Coventryville Historic District (1975)- HDA	2.6
SpringCityB-1	Protect the Spring City Sewer Plan from the vulnerably to dam failure and to the 0.2% annual chance flood level.	2.6
SpringCityB-2	The municipal FPA will work with the Hydromotion owner/operator to protect the facility from the vulnerabilities of dam failure	2.6
SpringCityB-3	Work with management of major businesses to protect the buildings from the vulnerably to dam failure and to the 0.2% annual chance flood level.	2.6
SpringCityB-4	Work with the Textile Mill owner to determine what flood protection measures can be taken to protect the facility from the vulnerabilities from dam failure	2.6
ThornburyT-7	Work with power company to protect Thornbury - Westtown Road Electrical Substation to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.	2.6
TredyffrinT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cedar Hollow Industrial Track: Bridge, County Bridge No. 171, Great Valley Mill, Jerman, Thomas, Property, and historic structure on SR 7015	2.6
ValleyT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from vulnerabilities to dam failure: County Bridge No. 101 and Scott Farm Property	2.6
WallaceT-1	Protect Glenmoore FC Fire Station from a potential dam failure	2.6
WallaceT-2	The municipal FPA to work with the Verizon Glenmoore ESS Bldg. facility owner/operator to protect the facility from the vulnerabilities to dam failure	2.6
WallaceT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Glenmoore Historic District and Steels Bridge	2.6
WarwickT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Hockley Mill Farm, Knauer Patent Thematic District, North Warwick Historic & Archaeological District (HDA), North Warwick HDA, and historic structure located on SR 7015	2.6
WestBradfordT-4	Protect the Broad Run Sewage Treatment Plant from dam failure and to the 0.2% annual chance flood level.	2.6
WestBradfordT-5	Work with the management of Ram-t Construction Specialist to protect the buildings from dam failure.	2.6
WestBradfordT-6	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the	2.6



Mitigation Action		Score
	vulnerabilities to flooding: Derbydown Homestead, Northbrook Historic District, Pennsylvania Railroad: Morrisville Lien: Viaduct	
WestBrandywineT-1	Work with the Grow, James, House property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	2.6
WestChesterB-2	The municipal FPA to work with the National Foam facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestFallowfieldT-1	Work with the Ross Fording Road Bridge property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	2.6
WestGoshenT-3	The municipal FPA to work with the A. Duie Plyle PB II Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestGoshenT-4	The municipal FPA to work with the A. Duie Plye Bolmar Street Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestGoshenT-5	The municipal FPA to work with the A. Duie Pyle West Chester Truck Terminal facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestGoshenT-6	The municipal FPA to work with the Wire and Cable Specialties facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestGoshenT-7	Work with the Greystone Hall property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	2.6
WestMarlboroughT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: House at Springdell, Pennock, Martha House & Industrial Site, and Speakman No.1 Covered Bridge	2.6
WestNantmealT-1	Work with the Isabella Furnace owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	2.6
WestPikelandT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Anselma Mill District-HDA, Clinger-Moses Mill Complex, Lightfoot Mill, and Vitale House	2.6
WestVincentT-2	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Halls Covered Bridge, Tyson's Bridge, and historic structure on Kimberton Road	2.6
WestWhitelandT-10	The municipal FPA to work with the Verizon Exton ESS Bldg. facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.6
WestWhitelandT-11	Work with power company to protect West Whiteland - S Whitford Road Electrical Substation to the 0.2% annual chance flood event.	2.6
WestWhitelandT-12	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Colebrook Manor, Exton Hotel, Thomas, John Roberts, Tennant Farmstead, Turnpike Station House, Whitford Station House, and William's Deluxe Cabins	2.6
WesttownT-10	Protect critical infrastructures (Schools, daycare, apartment buildings, and nursing home) on Rt. 202 around Skiles Blvd from HAZMAT transportation accidents	2.6
WesttownT-11	Protect the following properties from a potential pipeline incident: Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West Chester, PA 19382) . Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352	2.6
WesttownT-12	Protect the Westtown Wastewater Treatment Plant from dam failure and to the 0.2% annual chance flood level.	2.6
WesttownT-17	Work with the County Bridge No. 148 owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.	2.6
ChesterC-5	Develop a plan to stagger traffic and implement delays/early releases for schools, government, and private sector during a disaster	2.5
ChesterC-31	Provide public education on traffic accident reduction	2.5
ChesterC-35	Retrofit critical public facilities with safe rooms	2.5
CoatesvilleC-5	Gibbons Run Culvert Flooding and Structural Stability	2.5
Coatesville C-11	63 S. 5th Ave. Property Protection - protect the existing grocery store on the corner of Olive St. and S 5th Ave.	2.5
Coatesville C-17	Create a Capital Improvements Plan	2.5
Coatesville C-19	Route 82 Slope Stability - ensure the stability of the slopes along the eastern side of Route 82 in order to maintain unimpeded direct access into and out of the City.	2.5
EastPikelandT-5	Retrofit critical public facilities with safe rooms	2.5
HoneyBrookB-1	Work with PennDOT to improve US-322 corridors to mitigate traffic accidents	2.5
LondonderryT-11	Work with PennDOT to reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd	2.5
NewlinT-2	Fix and pave road that has been destroyed on Laurel Road including three driveways	2.5
SchuylkillT-7	Retrofit critical public facilities with safe rooms	2.5
Medium Priority		
PocopsonT-3	The municipal FPA to work with the Lenape Forged Products Corp facility owner/operator to protect the facility from the vulnerabilities of dam failure.	2.4



Mitigation Action		Score
ChesterC-1	As opportunities arise, elevate, or acquire properties within flood-prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	2.3
ChesterC-7	Develop and implement a model natural conservation ordinance for municipal adoption	2.3
ChesterC-8	Educate county residents on the NFIP following flood events	2.3
ChesterC-14	Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	2.3
ChesterC-19	Improve storm drains throughout the County to handle snow melt	2.3
ChesterC-21	Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	2.3
ChesterC-22	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	2.3
ChesterC-24	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	2.3
ChesterC-28	Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.	2.3
ChesterC-29	Provide education to the municipalities on flood gauges.	2.3
ChesterC-34	Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	2.3
ChesterC-36	Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	2.3
ChesterC-39	The county and all municipalities with a dam will work with dam operators to ensure they are protected to the 0.2% annual chance flood level.	2.3
ChesterC-44	The county will assess their bridges to determine what measures can be taken to protect them to the 0.2% annual chance flood level.	2.3
ChesterC-47	When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	2.3
ChesterC-48	Work with district courts to ensure they have plans in place for off-site hazmat releases that can affect the courts.	2.3
ChesterC-49	Work with hazmat facilities to inform them of the hazards they face and ensure emergency plans are current.	2.3
ChesterC-50	Work with hospitals to ensure they have plans in place for off-site hazmat releases that can affect hospitals.	2.3
ChesterC-52	Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	2.3
ChesterC-55	Work with Verizon to protect the facilities from flood or dam failure.	2.3
ChesterC-56	Educate the public about resources available to combat the opioid abuse/addiction.	2.3
AtglenB-1	The municipal FPA will work with the Atglen Borough Sewer Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.3
AtglenB-2	Work with the property owner to determine what flood protection measures can be taken to protect the structure to the 0.2% annual chance flood level.	2.3
AvondaleB-1	The municipal FPA will work with the Avondale Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level	2.3
BirminghamT-3	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Brinton's Mill, Lenape Bridge, and Painter, Joseph, Farm	2.3
CalnT-3	Protect the Caln Radio Tower to the 0.2% annual chance flood level and from a potential dam failure.	2.3
CalnT-4	Work with Downingtown Middle School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.	2.3
CharlestownT-1	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pennsylvania Railroad Bridge (No.205), Pickering Dam	2.3
CoatesvilleC-4	Protect ArcelorMital Emergency Services to the 0.2% annual chance flood level.	2.3
CoatesvilleC-6	The municipal FPA will work with the Martin-Brower facility owner/operator to protect the facility to the 0.2% annual chance flood level and dam failure.	2.3
CoatesvilleC-8	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: High Bridge, Huston, Abram, House & Carriage House, Lukens Main Office Building	2.3
Coatesville C-18	Provide backup power at the City's traffic signals, including developing a plan for implementation and refueling.	2.3
DowningtownB-9	The municipal FPA will work with AT&T Mobility Downingtown - USID53712 facility owner/operator to protect the facility from its vulnerability to dam failure.	2.3
DowningtownB-10	The Municipal FPA will work with the Downingtown Municipal Water Authority owner/operator to the 0.2% annual chance flood level and from vulnerability to dam failure.	2.3



Mitigation Action		Score
DowningtownB-11	The municipal FPA will work with the Inland Flexo, LLC facility owner/operator to protect the facility from its vulnerability to dam failure.	2.3
DowningtownB-12	The municipal FPA will work with the Johnson Matthey AGT facility owner/operator to protect the facility from vulnerability to dam failure.	2.3
DowningtownB-13	The municipal FPA will work with the Verizon Downingtown CO owner/operator to protect the facility from vulnerability to dam failure.	2.3
DowningtownB-14	The municipal FPA will work with the Victory Brewing Company, LLC owner/operator to protect the facility from vulnerability to dam failure.	2.3
EastWhitelandT-1	Increase stormwater pipe size at Hillbrook Circle	2.3
ChesterC-21	Increase cell coverage and telecommunications bandwidth in areas with poor coverage	2.2
Coatesville C-16	Public Information Programs - develop education packages, classes, meetings, programs, etc. with the goal of improving public knowledge of potential hazards within the City and how these hazards are dealt with.	2.2
ChesterC-2	Coordinate utilization of privately-owned digital billboards for emergency usages	2.1
ChesterC-13	Encourage new development planning to include burying of utility cables	2.1
ChesterC-23	Install back-up power sources for traffic signals (generator, battery, solar)	2.1
ChesterC-26	Plan for replenishment fuel for generators	2.1
ChesterC-33	Purchase backup generators for critical infrastructure/key resources	2.1
ChesterC-37	Sustain tree management programs around power lines	2.1
EastBradfordT-9	Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Nields Street	2.1
EastBrandywineT-9	Install generator connection at East Brandywine Baptist Church	2.1
EastBrandywineT-10	Install generator connection at Hopewell United Methodist Church	2.1
EastPikelandT-1	Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	2.1
EastWhitelandT-2	Install a generator at the Meadowview pump station	2.1
EastWhitelandT-3	Install a generator at the pump station on Flat Road	2.1
LondonGroveT-6	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.	2.1
LondonGroveT-7	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable until as opposed to three permanent generators providing additional costs savings.	2.1
LondonderryT-7	Install a generator in the Township Building	2.1
LondonderryT-10	Purchase and install a backup generator at the Municipal Building	2.1
NewlinT-4	Replant Ash Trees that were lost to the Ash Borer and determine the best actions to prevent invasive species in the future	2.1
NewGardenT-4	Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike	2.1
NewGardenT-5	Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike	2.1
NewGardenT-6	Purchase portable generator for traffic signal at Newark Rd and Rt 41	2.1
NewGardenT-7	Purchase portable generator for traffic signal at Penn Green Rd and Rt 41	2.1
NewGardenT-8	Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike	2.1
NewGardenT-9	Purchase portable generator for traffic signal at Southwood Rd and Rt 7	2.1
SouthCoventry-4	Purchase and install a backup generator for the Woodridge Sewer Plant at 190 Ridgeview Drive	2.1
WestBradfordT-1	Acquire and install back-up generator at Wastewater Treatment Plant	2.1
WestChesterB-1	Obtain a backup generator for Goodwill Fire Company	2.1
WestVincentT-1	Backup Generators (2) Acquisition and Installation at Matthews Meadows Sewer Plant	2.1
WesttownT-2	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating invasive species risks.	2.1
WesttownT-3	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)	2.1
ChesterC-3	Create a website to assist landowners and municipalities to navigate FEMA resources	2.0
EastBradfordT-1	Acquisition/elevation of structure at 414 Cottage Lane	2.0
EastBradfordT-2	Acquisition/elevation of structure located at 402 Cottage Lane	2.0
EastBradfordT-3	Acquisition/elevation of structure located at 406 Cottage Lane	2.0
EastBradfordT-4	Acquisition/elevation of structure located at 418 Cottage Lane	2.0
EastBradfordT-5	Acquisition/Elevation of structure located at 502 River Bend Lane	2.0
EastBradfordT-6	Acquisition/Elevation of structure located at 530 River Bend Lane	2.0
EastBradfordT-7	Acquisition/Elevation of structure located at 550 River Bend Lane	2.0
EastBradfordT-8	Acquisition/Elevation of structure located at 558 River Bend Lane	2.0
EastBradfordT-15	Property protection of structure located at 1010 Valley Creek Road	2.0
EastBrandywineT-1	Acquire/elevate structure at 745 Creek Road	2.0
EastBrandywineT-2	Acquire/elevate structure at 755 Creek Road	2.0
EastBrandywineT-3	Acquire/elevate structure at 765 Creek Road	2.0
EastBrandywineT-4	Acquire/elevate structure at 775 Creek Road	2.0
EastBrandywineT-5	Acquire/elevate structure at 785 Creek Road	2.0



Mitigation Action		Score
EastBrandywineT-11	Property protection of structure located at 1051 Creek Road	2.0
EastBrandywineT-12	Property protection of structure located at 1061 Creek Road	2.0
EastBrandywineT-13	Property protection of structure located at 1081 Creek Road	2.0
EastCoventryT-1	Acquisition/elevation of structure located at 285 Linfield Road	2.0
KennettT-1	Acquisition/elevation of structure located at 611 Creek Road	2.0
KennettT-2	Acquisition/elevation of structure located at 903 Creek Road	2.0
KennettT-3	Acquisition/elevation of structure located at 909 Creek Road	2.0
UpperUwchlanT-1	Acquisition/elevation of the structure located at 2 Kiloran Wynd	2.0
UpperUwchlanT-2	Acquisition/elevation of the structure located at 80 Saint Andrews Ln	2.0
ValleyT-3	Assess drainage into Sucker Run near South Park Avenue and PA-372 to identify the best action to prevent flooding during heavy rainfall events, and implement the action.	2.0
WestWhitelandT-1	Elevation/acquisition of structure located at 116 N. Locust Lane	2.0
WestWhitelandT-2	Elevation/acquisition of structure located at 117 N. Locust Lane	2.0
WestWhitelandT-3	Elevation/acquisition of structure located at 117 Valley Road	2.0
WestWhitelandT-4	Elevation/acquisition of structure located at 118 Valley Road	2.0
WestWhitelandT-5	Elevation/acquisition of structure located at 120 Valley Road	2.0
WestWhitelandT-6	Elevation/Acquisition of structure located at 510 Winding Way	2.0
WestWhitelandT-7	Elevation/acquisition of structure located at 512 Winding Way	2.0
WestWhitelandT-8	Elevation/acquisition of structure located at 513 Winding Way	2.0
WesttownT-1	Acquire/elevate roadways/properties along Chester Creek - Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive	2.0
WesttownT-16	Retrofit WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.	2.0
Willistown T-1	Elevation/Acquisition of the structure located at 1 Eisenhower Dr	2.0
Willistown T-2	Elevation/Acquisition of the structure located at 116 Davis Rd	2.0
ChesterC-6	Develop an outreach and awareness program and provide to municipalities, where residents and potential homeowners could access to identify any risks they might have to address	1.9
ChesterC-9	Educate the public on all the hazards they face	1.9
ChesterC-11	Encourage municipalities to adopt an ordinance outlining the process to implement a snow emergency declaration	1.9
ChesterC-12	Encourage municipalities to require radon testing at the time sale of homes	1.9
ChesterC-18	Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents	1.9
ChesterC-27	Plant bushes/other vegetation to stop drifting snow in known problem areas	1.9
ChesterC-30	Provide education to the municipalities on resident evacuation processes and need	1.9
WesttownT-4	Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.	1.9
WesttownT-5	Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.	1.9
WesttownT-6	Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.	1.9
WesttownT-9	Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.	1.9
WesttownT-13	Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.	1.9
Low Priority		
BirminghamT-1	Build an access road to Masters Way to Webb Rd	1.8
BirminghamT-2	Work with PennDOT to reengineer intersection at Street Road (PA 926) bridge over Brandywine Creek	1.8
CalnT-1	Acquire/Elevate the building located on 135 Seltzer Road	1.8
EastBrandywineT-7	Increase size of culvert crossing at 2069 Bondsville Road	1.8
EastFallowfieldT-1	Improve drainage to reduce flooding along Mortonville Road including intersection of Mortonville Road and Sawmill Road	1.8
EastFallowfieldT-2	Improve drainage to reduce flooding on Timacula Road	1.8
EasttownT-1	Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed	1.8
FranklinT-1	Clear out blocked inlets at 896 between Goodhope Road and Gypsey Hill	1.8
FranklinT-2	Divert water on 512 Chesterville Road during heavy rain events	1.8
FranklinT-3	Improve drainage on North Clay Creek and Churchill Road	1.8
FranklinT-4	Improve drainage to reduce flooding at Green Bridge on Strickersville Road and Appleton Road	1.8
KennettSquareB-1	Improve drainage on East South Street between S Walnut and Broad Street to prevent flooding	1.8
KennettSquareB-2	Improve drainage on South Street at Lafayette and Grant Way	1.8
KennettSquareB-3	Improve drainage on Walnut Street between Birch and East South St	1.8



Mitigation Action		Score
KennettSquareB-4	Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St, west of Union St	1.8
KennettT-4	Assess and determine the best action to prevent East Hillendale Rd from flooding	1.8
KennettT-5	Assess and determine the best action to prevent flooding of Kaolin Rd from stream	1.8
KennettT-6	Assess and determine the best action to prevent flooding of Marshall Bridge a Route 82 South	1.8
KennettT-7	Assess and determine the best action to prevent flooding of the West Hillendale stream from Chandler Mill to Scarlet	1.8
KennettT-8	Assess and determine the best action to prevent further erosion of Bucktoe Road stream banks and prevent flooding of the road	1.8
KennettT-9	Assess and determine the best action to prevent Rosedale Road stream from overflowing onto the road	1.8
KennettT-10	Assess and determine the best action to prevent the stream on Center Mill Road from overflowing	1.8
KennettT-15	Work with county to improve drainage on Bayard Road	1.8
KennettT-16	Work with the county to improve drainage on Pemberton Road Bridge from Mill Road to Cedar Springs to prevent flooding	1.8
KennettT-17	Work with the county to improve drainage on South Street from Scarlet to Chandler Mill	1.8
LondonGroveT-9	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources	1.8
LondonGroveT-10	To remove an existing narrow culvert and replace with a structure to span the base flood elevations. Portions or all the structure removal and replacements could be completed utilizing Municipal Public Works.	1.8
LondonGroveT-11	Widen bridge and bridge approaches at Indian Run Rd	1.8
LondonderryT-1	Work with PennDOT to clear the brush in roadway lines of sight at Rt 796 and Rt 41	1.8
LondonderryT-4	Improve and enhance culverts on Jackson Rd and Faggs Manor Rd	1.8
LondonderryT-6	Increase the height of the bridge at Whitehorse Rd near Creek Rd	1.8
MalvernB-1	Elevation/Acquisition of structure located at 135 Powelton Ave	1.8
MalvernB-2	Elevation/Acquisition of structure located at 145 Powelton Ave	1.8
MalvernB-3	Elevation/Acquisition of structures 10 through 142 W First Ave	1.8
MalvernB-4	Elevation/Acquisition of structures 193 through 323 Paoli Pike	1.8
MalvernB-5	Elevation/Acquisition of structures 2 through 10 Remington Ln	1.8
MalvernB-6	Elevation/Acquisition of structures 217 through 545 S. Warren Ave	1.8
MalvernB-7	Increase culvert size at 313 S Warren Ave	1.8
NewGardenT-1	Construct larger culvert at Cedar Springs Rd at Pemberton Rd	1.8
NewGardenT-2	Construct larger culvert at Egypt Run Road	1.8
PhoenixvilleB-1	Improve drainage at the intersection of Bridge and Church St.	1.8
PocopsonT-1	Assess and determine the best action to prevent flooding around Brandywine Creek on Northbrook Road, one lane historical bridge	1.8
SadsburyT-1	Assess and determine the best action to improve drainage and reduce flooding on Greenbelt Drive	1.8
SchuylkillT-1	Acquisition/Elevation of the structure located at 493 State Creek Road	1.8
SchuylkillT-2	Construct Larger Culvert at East Phillip Drive	1.8
SchuylkillT-3	Construct larger culvert at S Whitehorse Road	1.8
SchuylkillT-6	Protect Structure with Barrier at Creek Road Bridge	1.8
SouthCoatesvilleB-1	Investigate stormwater management options and identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents throughout South Coatesville Borough	1.8
SouthCoventry-1	Construct larger culvert at Bealor Road	1.8
SouthCoventry-2	Determine the best action to prevent downhill flooding on Coventryville Rd & Harmonyville Road, close to North Cov. Border	1.8
TredyffrinT-1	Clogged inverts throughout the township causing flooding	1.8
TredyffrinT-2	Improve drainage to reduce flooding on Hadwick Road and Upper Weedly Road	1.8
TredyffrinT-4	Improve drainage to reduce flooding on Wills Lane, Woodcrest Drive, and Saunders Drive	1.8
UpperUwchlanT-3	Protect Larkins Bridge with barrier	1.8
UpperUwchlanT-4	Protect structure with barrier on Dorothy Lane	1.8
UpperUwchlanT-5	Protect structure with barrier on Font Road	1.8
UpperUwchlanT-6	Protect structure with barrier on Lyndell Road	1.8
UpperUwchlanT-7	Protect structure with barrier on Moore Road and Turnstone Way	1.8
UpperUwchlanT-8	Protect structure with barrier on St Andrews Lane	1.8
UpperUwchlanT-9	Protect Windsor Schoolhouse with barrier	1.8
UpperUwchlanT-10	Raise Fellowship Road roadway at Red Bone Road	1.8
UpperUwchlanT-11	Stormwater culvert and basin re-sizing on Greenridge Road	1.8
UpperUwchlanT-12	Stormwater culvert and basin re-sizing on Krauser Rd	1.8
WestBradfordT-2	Improve drainage on Broad Run Road between Beacon Hill	1.8
WestGoshenT-1	Improve culvert at 103 Oak Lane	1.8



Mitigation Action		Score
WestMarlboroughT-1	Assess and determine the best actions to prevent flooding on bridges along Rt 82 from Unionville to Coatesville	1.8
WestWhitelandT-9	Remove silt/clean Valley Creek bed	1.8
Willistown T-4	Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd	1.8
Willistown T-5	Increase drainage basin size at Rustmont Homeowners Association	1.8
Willistown T-6	Increase drainage basin size behind Malvern Fire Company	1.8
Willistown T-7	Increase drainage basin size of the Family Life Basin	1.8
Willistown T-8	Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd	1.8
Willistown T-11	Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek	1.8
Willistown T-12	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd	1.8
Willistown T-13	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	1.8
LondonderryT-2	Work with PennDOT to construct a roundabout at the intersection of PA Route 41 and PA route 926	1.7
LondonderryT-9	Purchase 2-way radios to assist in communication during emergency events in the township	1.7
ChesterC-4	Develop a countywide Debris Management Plan	1.5
ChesterC-15	Enhance the household hazard waste program to reduce post-event hazardous debris	1.5
ChesterC-16	Ensure that the county has a COOP/COG Plan and procedures in place for off-site hazmat releases that can affect the buildings.	1.5
ChesterC-17	Ensure that the municipal EMAs have COOP/COG plans	1.5
ChesterC-22	Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	1.5
ChesterC-25	Investigate the interaction of public agencies and camera data from private companies/citizens	1.5
ChesterC-32	Provide public information on debris management	1.5
ChesterC-38	The county and all municipalities will work with their major businesses to ensure they have continuity plans in place.	1.5
ChesterC-46	Update countywide Model Stormwater Ordinance	1.5
ChesterC-53	Work with the railroad industry to address safety concerns and aging rail infrastructure	1.5
EastPikelandT-8	Work with the railroad industry to address safety concerns and aging rail infrastructure	1.5
LondonGroveT-5	Reconfigure stream channel at Sullivan Rd & Clay Creek Rd	1.5
LondonderryT-5	Improve plans and communication in case of emergency.	1.5
PocopsonT-2	Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding	1.5
WesttownT-7	Work with PennDOT to conduct an assessment on how to improve design of Route 352/Rt. 3 intersection	1.5
WesttownT-8	Work with PennDOT to conduct an assessment to improve the design of Route 202 at 926 intersection and High Street/202 merge	1.5
WesttownT-14	Work with PennDOT to redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge	1.5
WesttownT-15	Work with PennDOT to redesign the intersection of SR 926 and Avonlea Circle and Tanguy Road to improve line of sight.	1.5
EastPikelandT-2	Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	1.4
ChesterC-10	Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	1.3
CoatesvilleC-2	Install gates to be closed during flood incidents and signage at 11th Avenue and railroad underpass	1.3
EastBradfordT-10	Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road	1.3
EastBradfordT-11	Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road	1.3
EastBradfordT-12	Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way	1.3
EastBradfordT-13	Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road	1.3
EastBrandywineT-8	Install a flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road	1.3
EastWhitelandT-4	Install gates to be closed during flood incidents and signage at Church Road	1.3
EastWhitelandT-5	Install gates to be closed during flood incidents and signage at Old Morehall Road	1.3
KennettT-11	Install gates to be closed during flood incidents and signaled at flood intersections within the township	1.3



Mitigation Action		Score
KennettT-12	Install warning signs to be utilized during flood incidents at flood-prone bridges within the township	1.3
LondonBritainT-4	Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd	1.3
LondonBritainT-5	Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd	1.3
LondonBritainT-6	Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd	1.3
LondonBritainT-7	Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd	1.3
LondonBritainT-8	Install gates to be closed during flood incidents and signage at Yeatmans Station Rd	1.3
LondonGroveT-3	Install gates and signage within flood-prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters.	1.3
PennT-1	Enhance stormwater management regulations	1.3
PennsburyT-1	Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd	1.3
PennsburyT-2	Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek	1.3
SadsburyT-2	Install gates to be closed during flood incidents and signage on sections of Old Mill Road	1.3
SouthCoventry-3	Install flood water collection boxes and piping on Schoolhouse Road and Porter's Mill Road	1.3
ThornburyT-2	Install gates to be closed during flood incidents and signage at Rt 926 and Creek Road	1.3
ThornburyT-3	Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd	1.3
ThornburyT-4	Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd	1.3
ThornburyT-5	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd north of Railroad Bridge	1.3
ThornburyT-6	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge	1.3
WestBradfordT-3	Install 4 gates to be closed during flood incidents and signage at Downingtown Pike between Harmony Hill Rd and Skelp Level Rd	1.3
WestGoshenT-2	Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery	1.3
WestNottinghamT-1	Install gates to be closed during flood incidents and signage at Fremont Road between Willow Road and King Pen Road	1.3
WestNottinghamT-2	Install gates to be closed during flood incidents and signage at Park Road between Veteran's Drive and Sand Hill Road	1.3
Willistown T-9	Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek	1.3
Willistown T-10	Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	1.3
EastCoventryT-2	Install emergency alerting systems for East Coventry Township	1.0
EastMarlboroughT-1	Emergency alerting systems for East Marlborough Township	1.0
EastPikelandT-3	Plant bushes/other vegetation to stop drifting snow in known problem areas	1.0
LondonBritainT-1	Emergency alerting systems for London Britain Township	1.0
LondonBritainT-2	Install a snow fence during snow season to prevent snow drifting on South Bank Rd	1.0
LondonBritainT-3	Install a snow fence during snow season to prevent snow drifting on Strickersville Rd	1.0
LondonGroveT-1	Emergency alerting systems/public notification system for London Grove Township	1.0
LondonGroveT-2	Install alerting system/public notification system to profiteering/notification of potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.	1.0
LondonderryT-3	Emergency alerting systems/public notification system for Londonderry Township	1.0
LondonderryT-8	Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station	1.0
NewGardenT-3	Emergency alerting systems for New Garden Township	1.0
OxfordB-1	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8th Street.	1.0
SchuylkillT-5	Plant bushes/other vegetation to stop drifting snow in known problem areas	1.0
Willistown T-3	Emergency alerting systems for Willistown Township	1.0
ThornburyT-1	Work with PennDOT to conduct an assessment of flood-prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd	0.8
EastPikelandT-4	Purchase temporary mobile camera to set up for events and use to monitor safety and security	0.7



SECTION 7 PLAN MAINTENANCE PROCEDURES

This section describes the plan update process since 2015 (Section 7.1); the system that Chester County and all participating jurisdictions have established to monitor, evaluate, and update the Hazard Mitigation Plan (HMP) (Section 7.2); and the strategy to continue public involvement for plan maintenance (Section 7.3).

7.1 UPDATE PROCESS SUMMARY

Monitoring, evaluating, and updating the HMP is critical to maintaining its value and supporting the success of Chester County's hazard mitigation efforts. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and supports future resiliency.

The Steering Committee reviewed the 2015 plan maintenance procedures and carried them forward to the current HMP update process, as described in the sections below. Going forward, the plan will continue to be available on the Chester County Department of Emergency Services (DES) website (<https://www.chesco.org/217/Emergency-Services>). The 2021 plan maintenance procedures also describe the ways in which this plan may be integrated into other planning mechanisms in the county.

7.2 MONITORING, EVALUATING, AND UPDATING THE PLAN

The Chester County HMP Planning Team intends to remain intact as the organization responsible for monitoring, evaluating, and updating this plan. The DES Emergency Preparedness Coordinator will serve as HMP Coordinator for the Planning Team. Each participating jurisdiction is expected to retain a municipal hazard mitigation representative to support the jurisdiction's input to the monitoring, evaluating, and updating responsibilities identified in this section. Members of the Planning Team are listed in Section 3.

Understanding that individual commitments change over time, each jurisdiction and its representatives are responsible for informing the Chester County HMP Coordinator of any changes in representation by formal letter. The HMP Coordinator will strive to ensure that the Planning Team is made up of representatives from planning partners and stakeholder organizations within the county. The HMP Coordinator will maintain a record of the current membership of the Planning Team on the Chester County DES website (<https://www.chesco.org/217/Emergency-Services/>) or in publicly-accessible county records. During the planning process, the HMP can be found at <https://www.chestercountypahmp.com/>. Upon approval by FEMA, the HMP can be found on the Chester County DES website.

The following sections describe the monitoring, evaluating, and updating processes and protocols for the Chester County HMP.

7.2.1 Monitoring

The Planning Team will be responsible for monitoring implementation, evaluating the effectiveness of the HMP, and documenting this information in an annual progress report. Prior to Planning Team progress meetings (detailed below), Planning Team representatives may collect information from departments, agencies, and organizations involved with the mitigation activities identified in Section 6 of this plan. The representatives will make phone calls and conduct meetings with persons responsible for initiating and/or overseeing the mitigation projects to obtain progress information. Copies of any grant applications filed on behalf of any of the participating jurisdictions will be requested by the Planning Team. Further, the representatives shall obtain from their municipal supervisor, mayor, or councilperson any public comments made on the plan and provide them to the Planning Team for inclusion in the progress report.



Planning Team representatives will be expected to document the following, as needed and as appropriate:

- Additional stakeholders (such as planning agencies and business representatives) who should be invited to participate in the planning process;
- Additional local assets (such as major employers, local points of interest, and residential areas) to consider in the risk assessment and mitigation strategy, so that the HMP can include more details regarding the vital assets of each municipality;
- Hazard events and losses occurring in their jurisdiction, including their nature, extent, and the effects that hazard mitigation actions have had on impacts and losses;
- Progress on the implementation of mitigation actions, including efforts to obtain outside funding for mitigation actions;
- Any obstacles or impediments to the implementation of actions;
- Additional mitigation actions believed to be appropriate and feasible;
- Ways in which each municipality conducts floodplain management in accordance with the National Flood Insurance Program (NFIP) (through completion of the NFIP Survey worksheet); and
- Public and stakeholder input and comments on the plan.

Planning Team representatives may use the progress reporting forms (Worksheets #1 and #3 in the Federal Emergency Management Agency [FEMA] 386-4 guidance document¹) to facilitate collection of progress data and information on specific mitigation actions.

7.2.2 Evaluating

The evaluation of the HMP is an assessment of whether (1) the planning process and actions have been effective, (2) the plan's goals are being reached, and (3) changes are needed. The plan will be evaluated on an annual basis to determine the effectiveness of the programs and to reflect changes that may affect mitigation priorities or available funding.

The status of the HMP will be discussed and documented at annual plan review meetings of the Hazard Mitigation Planning Team. At least 1 month before the progress plan review meeting, the Chester County HMP Coordinator will advise Planning Team members of the meeting date, agenda, and expectations of the members. The Chester County HMP Coordinator may also distribute additional flood mitigation survey and mitigation project opportunity forms for jurisdictions that may have new information or jurisdictions that did not participate in the update process.

The Chester County HMP Coordinator will be responsible for calling and coordinating the progress plan review meeting and assessing progress toward achieving plan goals and objectives. These evaluations will assess whether:

- Goals and objectives address current and expected conditions;
- The nature or magnitude of the risks has changed;
- The HMP has been implemented into land use guidance and/or regulations on the county and municipal levels;
- Current resources are appropriate for implementing the HMP, and whether different or additional resources are now available;
- Actions are cost effective;
- Schedules and budgets are feasible;

¹ https://www.fema.gov/media-library-data/20130726-1521-20490-9008/fema_386_4.pdf



- Implementation problems exist—such as technical, political, legal, or coordination issues with other agencies;
- Outcomes have occurred as expected;
- Changes in county or municipal resources have impacted plan implementation (for example, funding, personnel, and equipment);
- New agencies, departments, or staff should be included, including other local governments as defined under 44 *Code of Federal Regulations* (CFR), Section 201.2;
- Documentation has been completed for any hazards that occurred during the last year.

Specifically, the Planning Team will review the mitigation goals, objectives, activities, and projects using the following performance-based indicators:

- New agencies or departments created that have authority to implement mitigation actions or are required to meet goals, objectives, and actions;
- Project evaluation based on current needs of the mitigation plan;
- Project completion regarding progress of proposed or ongoing actions;
- Under or over-spending regarding proposed mitigation action budgets;
- Achievement of the goals and objectives;
- Resource allocation to note whether resources are required to implement mitigation activities;
- Timeframe comments on whether proposed schedules are sufficient to address actions;
- Budget notes (in other words, if budget basis should be changed or is sufficient);
- Lead or support agency commitment notes (if there is a lack of commitment on the part of lead or support agencies);
- Resource comments regarding whether resources are available to implement actions; and
- Feasibility comments regarding whether certain goals, objectives, or actions prove to be unfeasible.

Finally, the Planning Team will evaluate the ways other programs and policies have conflicted or augmented planned or implemented measures, and will identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions (described further in Section 5.2.6). These other programs and policies can include those that address the following:

- Economic development;
- Environmental preservation and permitting;
- Historic preservation;
- Redevelopment;
- Health and/or safety;
- Recreation;
- Land use and zoning;
- Public education and outreach; and
- Transportation.

The Planning Team may refer to the evaluation forms (Worksheets #2 and #4 in the FEMA 386-4 guidance document¹) to assist in the evaluation process.

The Chester County HMP Coordinator will be responsible for preparing an annual HMP progress report that will summarize information included on the local progress reports provided by each jurisdiction, information presented at the Planning Team meeting, and other information as appropriate and relevant. These reports will



provide data for the 5-year update of this HMP and will assist in identifying implementation challenges. By monitoring the implementation of the plan, the Planning Team will be able to assess which projects are completed, are no longer feasible, or may require additional funding.

The progress report will apply to all planning partners who have provided input, and as such, will be developed according to an agreed-upon format and with adequate allowance for input and comment of each planning partner prior to completion and submission to the State Hazard Mitigation Officer. Each planning partner will be responsible for providing this report to its governing body for their review.

During the Planning Team meeting, the HMP Coordinator will establish a schedule for the development, review, comment, amendment, and submission of the HMP progress report to the State Hazard Mitigation Officer.

The plan will also be evaluated and revised, if needed, following any major disasters to determine whether the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages, or if data listed in the Section 4.3 (Hazard Profiles) of this plan have been collected over the performance period to facilitate the risk assessment. Revisiting the risk assessment is an opportunity to increase the community's disaster resistance and build a better and stronger community.

7.2.3 Updating

Section 44 CFR 201.6.d.3 requires that local hazard mitigation plans be reviewed, revised (as appropriate), and resubmitted for approval to remain eligible for benefits awarded under the Disaster Mitigation Act of 2000 (DMA 2000). The Chester County Hazard Mitigation Planning Team updates this plan on a 5-year cycle from the date of plan adoption.

To facilitate the update process, the Chester County HMP Coordinator (with support from the Planning Team) will hold a meeting 3 years from the date of plan approval to develop and commence with the implementation of a detailed plan update program. The Chester County HMP Coordinator will invite representatives from the Pennsylvania Emergency Management Agency (PEMA) to this meeting to provide guidance on plan update procedures. This program will, at a minimum, establish (1) the parties responsible for managing and completing the plan update effort, (2) features needed to be included in the updated plan, and (3) a detailed timeline with milestones to ensure that the update is completed according to regulatory requirements.

At this meeting, the Planning Team will determine the resources needed to complete the update. The Chester County HMP Coordinator will be responsible for ensuring that needed resources are secured.

The Chester County HMP Coordinator is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the 5-year plan update, as appropriate. The Chester County HMP Coordinator will work with municipal representatives to provide additional opportunities for members of the public to learn about the hazards they face, and to provide information to be incorporated into the HMP. FEMA's National Flood Hazard Layer tools can be used as an interactive tool to facilitate this process. Additional meetings may also be held as deemed necessary by the Planning Team. The purpose of these meetings would be to provide an opportunity for the public to express concerns, opinions, and ideas about the HMP.

7.3 CONTINUED PUBLIC INVOLVEMENT

Chester County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. Therefore, the plan will be posted on the DES website (<https://www.chesco.org/217/Emergency-Services>), and copies of the plan will be made available for review during normal business hours at DES's main office. Chester County will make electronic copies of the plan available for local municipalities to provide public access.



Following each 5-year update of the HMP, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all Planning Team members and the Pennsylvania State Hazard Mitigation Officer.

The Chester County HMP Coordinator will be responsible for receiving, tracking, and filing public comments regarding this HMP. The public will have an opportunity to comment on the plan at the review meeting for the HMP and during the 5-year plan update. Chester County will maintain an active link on the DES website to collect public comments.

The Planning Team representatives are responsible for ensuring the following:

- Public comment and input on the HMP (and hazard mitigation in general) are recorded and addressed, as appropriate. An opportunity to comment on the plan will be provided directly on the DES website, and provisions for public comment submitted in writing will also be made. All public comments shall be addressed to:

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380

- Copies of the latest approved version of the plan are available for review at the municipal buildings along with instructions to facilitate public input and comment on the plan.
- Appropriate links to a Chester County HMP website (www.chestercountyhmp.com) will be maintained. The website will be monitored throughout the course of the HMP update process, and a draft copy of the plan will be posted for public comment. Upon conclusion of the update, appropriate links to the county HMP will be maintained on the DES website (<https://www.chesco.org/4261/Plans>).
- Public notices will be made, as appropriate, to inform the public of the availability of the plan, particularly during plan update cycles.

The Chester County HMP Coordinator will ensure the following:

- Public comment and input on the HMP (and hazard mitigation in general) will be recorded and addressed, as appropriate.
- HMP content on the DES website will be maintained and updated, as appropriate.
- All public and stakeholder comments received will be documented and maintained.
- Copies of the latest approved plan will be available for review at DES, along with instructions to facilitate public input and comment on the plan.
- Public notices, including media releases, will be made (as appropriate) to inform the public of the availability of the plan, particularly during plan update cycles.



SECTION 8 PLAN ADOPTION

By adopting the Chester County Hazard Mitigation Plan (HMP), local governing bodies demonstrate their commitment to fulfill the mitigation goals and objectives outlined in the plan. Adoption of the HMP by Chester County and each participating jurisdiction legitimizes the HMP and authorizes responsible agencies to execute their responsibilities.

Each participating jurisdiction in Chester County will continue with formal adoption proceedings upon conditional approval of this HMP from the Federal Emergency Management Agency (FEMA), known as “Approval Pending Adoption” (APA). Each participating jurisdiction understands that conditional approval of the HMP will be provided for those municipalities that meet the planning requirements with the exception of the adoption requirement, as stated above.

Following adoption or formal action on the HMP, each participating jurisdiction must submit a copy of the resolution or other legal instrument showing formal adoption (acceptance) of the HMP to the Chester County Hazard Mitigation Plan Coordinator. Chester County will forward the executed resolutions to the Pennsylvania Emergency Management Agency (PEMA), who will subsequently forward the resolutions to FEMA. Each participating jurisdiction understands that FEMA will transmit acknowledgement of verification of formal HMP adoption and the official approval of the HMP to the Hazard Mitigation Plan Coordinator. Resolutions reflecting the formal adoption of this HMP by the County and participating jurisdictions are included in Appendix F of this HMP. A sample resolution to be used by the County and its jurisdictions is provided on the following pages.



Chester County Hazard Mitigation Plan County Adoption Resolution

Resolution No. _____
Chester County, Pennsylvania

WHEREAS, the municipalities of Chester County, Pennsylvania, are most vulnerable to natural and human-made hazards, which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, Chester County acknowledges the requirement of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving Hazard Mitigation Assistance funds, and

WHEREAS, the Chester County Hazard Mitigation Plan has been developed by Chester County Department of Emergency Services in cooperation with other county departments, local municipal officials, and the citizens of Chester County, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Chester County Hazard Mitigation Plan, and

WHEREAS, the Chester County Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the county and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the County of Chester that:

- The 2021 Chester County Hazard Mitigation Plan is hereby adopted as the official Hazard Mitigation Plan of the county, and
- The respective officials and agencies identified in the implementation strategy of the 2021 Chester County Hazard Mitigation Plan are hereby directed to execute the recommended activities assigned to them.

ADOPTED, this _____ day of _____, 2021

ATTEST:

CHESTER COUNTY COMMISSIONERS

By _____

By _____

By _____



Chester County Hazard Mitigation Plan Municipal Adoption Resolution

Resolution No. _____
< Municipality Name>, Chester County, Pennsylvania

WHEREAS, the <Municipality Name>, Chester County, Pennsylvania, is most vulnerable to natural and human-made hazards, which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, the <Municipality Name> acknowledges the requirement of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving Hazard Mitigation Assistance funds, and

WHEREAS, the Chester County Hazard Mitigation Plan has been developed by Chester County Department of Emergency Services in cooperation with other county departments, and officials and citizens of <Municipality Name>, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Chester County Hazard Mitigation Plan, and

WHEREAS, the Chester County Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the county and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the <Municipality Name>:

- The 2021 Chester County Hazard Mitigation Plan is hereby adopted as the official Hazard Mitigation Plan of the <Municipality Name>, and
- The respective officials and agencies identified in the implementation strategy of the 2021 Chester County Hazard Mitigation Plan are hereby directed to execute the recommended activities assigned to them.

ADOPTED, this _____ day of _____, 2021

ATTEST:

< MUNICIPALITY NAME> REPRESENTATIVES

By _____

By _____

By _____



ACRONYMS AND ABBREVIATIONS

This resource identifies acronyms and abbreviations used in or supporting the Chester County Hazard Mitigation Plan (HMP). The acronyms and abbreviations listed below are based on documents included in the reference section, with modifications as appropriate to address the Chester County-specific identifications and requirements.

%	Percent
%g	Percent acceleration force of gravity
°F	Degrees Fahrenheit
ACS	American Community Survey
ALPB	Agricultural Land Preservation Board
APA	Approval Pending Adoption
ARC	American Red Cross
BCA	Benefit-cost analysis
BFE	Base flood elevation
BRIC	Building Resilient Infrastructure and Communities
CDBG	Community Development Block Grant
CDC	Centers for Disease Control and Prevention
CDMS	Comprehensive Data Management System
CERT	Community Emergency Response Team
cfs	Cubic feet per second
CFR	<i>Code of Federal Regulations</i>
COG	Continuity of government
COOP	Continuity of operations
COVID-19	2019 Coronavirus
CPC	Climate Prediction Center
CRREL	Cold Regions Research and Engineering Laboratory
CRS	Community Rating System
DCED	Department of Community and Economic Development
DCNR	Department of Conservation and Natural Resources
DDAP	Department of Drug and Alcohol Program
DEA	Drug Enforcement Administration
DEM	Digital Elevation Model
DES	Department of Emergency Services
DFIRM	Digital Flood Insurance Rate Map
DHS	U.S. Department of Homeland Security



DMA 2000	Disaster Mitigation Act of 2000
DOE	U.S. Department of Energy
DOH	Department of Health
DOT	U.S. Department of Transportation
DPS	Department of Public Safety
DPW	Department of Public Works
DR	Disaster Declarations
DRBC	Delaware River Basin Commission
EAP	Education and Awareness Program
EAP	Emergency action plan
EDA	U.S. Economic Development Administration
EF Scale	Enhanced Fujita Scale
EM	Emergency management
EMA	Emergency Management Agency
EMC	Emergency Management Coordinator
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency operations plan
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERC	Energy Release Component
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIA	Flood Insurance Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
Flu	Influenza
FMA	Flood Mitigation Assistance
FMP	Floodplain Management Plan
g	Gravity
GBS	General building stock
GIS	Geographic Information System
HazMat	Hazardous materials
Hazus	Hazards U.S.
Hazus-MH	Hazards U.S. – Multi-Hazard



HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, ventilation, and air conditioning
IA	Individual Assistance
I-	Interstate
IED	Improvised Explosive Devices
IFLOWS	Integrated Flood Observing and Warning System
ILI	Influenza-like illnesses
ISO	Insurance Services Office, Inc.
IT	Information Technology
K	Thousand
Km	Kilometer
Kts	Knots
LCSN	Lamont-Doherty Cooperative Seismographic Network
LEMC	Local Emergency Management Coordinator
LEPC	Local Emergency Planning Committee
LNG	Liquefied Natural Gas
LPR	Local Plans and Regulations
M	Million (\$)
mi	Mile
MMI	Modified Mercalli Intensity
MPC	Municipal Planning Code
mph	Miles per hour
MRP	Mean return period
MW	Megawatts
N/A	Not applicable
NA	Not available
NAS	Neonatal Abstinence Syndrome
NASA	National Aeronautics and Space Administration
NCDC	National Climatic Data Center
NCEI	National Centers for Environmental Information
NDMC	National Drought Mitigation Center
NDSP	National Dam Safety Program
NEHRP	National Earthquake Hazard Reduction Program



NEICA	Northeast Climate Impacts Assessments
NEPA	National Environmental Policy Act
NESEC	Northeast States Emergency Consortium
NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NGO	Nongovernmental organization
NIC	National Influenza Centers
NID	National Inventory of Dams
NIFC	National Interagency Fire Center
NIH	National Institute of Health
NIMS	National Incident Management System
NLCD	National Land Cover Data
NOAA	National Oceanic and Atmospheric Administration
NRCC	Northeast Regional Climate Center
NRCS	Natural Resource Conservation Service
NSIDC	National Snow and Ice Data Center
NSP	Natural Systems Protection
NSSL	National Severe Storms Library
NTAS	National Terrorism Advisory System
NTP	Narcotic Treatment Program
NTSB	National Transit Safety Board
NWS	National Weather Service
ODU	Opioid Use Disorder
PA	Pennsylvania
PA DCED	Pennsylvania Department of Community and Economic Development
PA DCNR	Pennsylvania Department of Conservation and Natural Resources
PA HMP	Commonwealth of Pennsylvania All-Hazard Mitigation Plan
PA-	Pennsylvania State Route ##
PA DEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PASDA	Pennsylvania Spatial Data Access
PDMP	Prescription Drug Monitoring Program
PDSI	Palmer Drought Severity Index
PEIRS	Pennsylvania Emergency Incident Reporting System
PEMA	Pennsylvania Emergency Management Agency



PennDOT	Pennsylvania Department of Transportation
PGA	Peak ground acceleration
PHGA	Peak horizontal ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIC	Pipeline Information Center
PISC	Pennsylvania Invasive Species Council
PSAP	Public Safety Answering Point
PSI	Pandemic Severity Index
PSP	Pennsylvania State Police
PSU	Pennsylvania State University
PUC	Public Utility Commission
RCV	Replacement cost value
RF	Risk factor
RL	Repetitive loss
RLP	Repetitive loss property
RS	RS Means Company, Inc.
RSI	Regional Snowfall Index
SARA	Superfund Amendments and Reauthorization Act
SBA	Small Business Administration
SEPA-RTF	Southeastern Pennsylvania Regional Task Force
SFHA	Special Flood Hazard Area
SHELDUS	Spatial Hazard Events and Loss Database for the U.S.
SIP	Structure and Infrastructure Project
SOG	Pennsylvania All-Hazard Mitigation Planning Standard Operating Guide
SPC	Storm Prediction Center
Sq. Mi.	Square mile
SRL	Severe repetitive loss
TBD	To be determined
TEIF	Total exposure in the floodplain
Tetra Tech	Tetra Tech, Inc.
TIP	Transportation improvement program
TRI	Toxic Release Inventory
US-	U.S. Route ##
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USD	U.S. dollar



USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
WHO	World Health Organization



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The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan’s strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Chester County	Title of Plan: Chester County HMP	Date of Plan: July 2021
Local Point of Contact: Gabby Ratliff	Address: 601 Westtown Road, Suite 012 West Chester, PA 19380	E-Mail: gratliff@chesco.org
Title: Community Resilience Coordinator		
Agency: Chester County Department of Emergency Services		
Phone Number: (610) 344-5042		

State Reviewer: Ernest Szabo	Title: State HM planner	Date: 12 April 21
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FEMA Reviewer: Joshua Norris	Title: MD FEMA Integration Team (FIT) Hazard Mitigation Planner	Date: June 11, 2021
Date Received in FEMA Region <i>(insert #)</i>		
Plan Not Approved	Minor revisions required.	
Plan Approvable Pending Adoption		
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been ‘Met’ or ‘Not Met.’ The ‘Required Revisions’ summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is ‘Not Met.’ Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 1.1; Sections 3.1 to 3.5; Appendix C; Appendix D; Appendix E	X		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Sections 3.1, 3.2, 3.3, 3.4, 3.5; Appendix C; Appendix D; Appendix E	X		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Sections 3.1, 3.3, and 3.4; Appendix E	X		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 5.2 (specifically Section 5.2.5); Appendix A Section 2.5, p. 2-21	X		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Sections 7.2.3, 7.3	X		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 7.2	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT A: REQUIRED REVISIONS:</u>				
<u>Comments:</u>				
<ul style="list-style-type: none"> - Kudos on executive summary. Summarized process, but any big changes from last plan? - 100% municipal participation HOOAH - Kudos for casting a wide net on stakeholders – adjacent counties, health, education, 1st responders and congregate care facilities - Huge amount of work is documented in appendixes C, D, F. However, it is hard to find any particular stakeholder or municipality among the thousands of pages. Recommend an index or table of content laying out each appendixes so they are easier to search and you can get full credit for all your work. 				
County Response: added bookmarks to Appendixes C, D, and E for easy navigation.				
<u>RECOMMENDED REVISIONS:</u>				
A2: Section 2, page 2-2 states that “Chester County’s population increased from 27,937 to 498,886 as of the 2010 census.” Consider including more recent census data. Notably, the 2019 Census Bureau population estimates for Chester County, PA can be found here: Census - Table Results .				
County Response: added the number from the 2018 estimate.				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Sections 4.2 and 4.3 (Section 4.3 consists of individual hazard profiles, including human-caused)			X
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4.3.X.3 (Past Occurrence) and 4.3.X.4 (Future Occurrence) for each hazard profiled		X	
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 4.3.X.5 (hazard vulnerability and impact for individual hazards in each hazard profile under Section 4.3), Section 4.4, Table 4.4-4 (Risk Ranking for Chester County) and Table 4.4-5 (Jurisdictional Risk by Municipality)		X	

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Section 4.3.7.5 (Specifically in the Vulnerability Assessment beginning on p. 4.3.7-40) Table 4.3.7-12	X	
<u>ELEMENT B: REQUIRED REVISIONS</u>				
<p>B1: Page 4.3.8-1 states that “[t]he following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hurricane, tropical storm, and Nor’easter hazard in Chester County.” However, Nor’easter information is not provided in section 4.3.8 as stated above. To address this revision, remove Nor’easter from the title of this section (and adjust the table of contents and other impacted plan components accordingly) or add the missing Nor’easter information (i.e. address type, location, extent, past occurrences, future probability, future conditions impacts, and provide a vulnerability analysis as the HMP does for the hurricane and tropical storm hazards).</p> <p>County Response: Removed “Nor’easter” from the title and content.</p> <p>B1: Resolve minor grammatical and occasional sentence flow errors throughout the document. For example:</p> <p>Page 1-1: “...increasing levels of deaths, injuries, property damage, and interruptions of business and government services. Remove “levels of,” to improve the flow of this sentence. County Response: Addressed.</p> <p>Page 2-2: “Today, it is the Pennsylvania’s,” remove “the” County Response: Addressed.</p> <p>Page 2-2: Change “compromised by...” to “comprised of” County Response: Addressed.</p> <p>Page 2-2: “Industrial land use is is extensive...” remove one “is” County Response: Addressed.</p> <p>Question: B.1. Deleted civil disturbance, ok if no events in county...did events in Portland, D.C. and elsewhere influence discussion?</p> <p>Comment: “Chester County has had a total of 27,079 cases of COVID-19 and 657 deaths since January 29 (CDC 2021).” Pp. 4.3.12-1 could use ‘as of date’ County Response: The “since” should have been “as of.” The data were as of 1/29/21. Updated the text.</p>				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
Pandemic, particularly COVID-19 discussions seems somewhat sparse, considering human and economic losses and ranking 4 th in HIRA.				
<u>ELEMENT B: RECOMMENDED REVISIONS</u>				
B3: In Section 4.3.7, should the “ New Coventry Township ” risk assessment map for Flooding, Flash Flooding, and Ice Jams instead state “North Coventry Township?” New Coventry was not included in Appendix B or in Section 2 as a Chester County municipality. If appropriate, please update the title of the map in question.				
County Response: Fixed the typo.				
B3: In Section 4.3.7, Table 4.3.7-17 and page 4.3.7-44 state that “Section 2 (County Profile) provides more information about the critical facilities and lifelines in Chester County,” yet Section 2 does not use the term lifelines. Consider more explicitly introducing the reader to the concept of community “lifelines” referenced in Table 4.3.7-17. For reference, information on FEMA’s Community Lifelines concept can be found here: Community Lifelines FEMA.gov .				
County Response: Added text about lifelines to Section 4.4 where it discussed critical facilities, and updated references to Section 2 to instead refer to Section 4.4 in Sections 4.3.2, 4.3.3, 4.3.7, and 4.3.19.				
B3: For the Radon Exposure, Pandemic and Infectious Diseases, and Invasive Species sections, add at least narrative summarizing climate change impacts.				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 5, specifically subsections 5.2.1 to 5.2.5	X		
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 5.2.1, pages 5-9 to 5-11, and Table 5-2, Appendix D	X		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6.2	X		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 6.3, 6.4 Appendix H	X		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Sections 6.4.1, 6.4.2, and 6.4.3	X		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 5.2.5	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT C: REQUIRED REVISIONS				
Question: Opioid addiction and Pandemic are hazards ranked 3 and 4 yet neither have specific mitigation actions?				
County Response: Added ChesterC-56 to address opioid addiction response. Added ChesterC-57 to address pandemic.				
ELEMENT C: RECOMMENDED REVISIONS:				
C2: Add the Rehabilitation of High Hazard Potential Dams (HHPD) Grant and related information to 5.2.3 Financial Capability, Federal Hazard Mitigation Planning Funding Opportunities section on pages 5-19 to 5-22. Information on this FEMA grant program can be accessed here: Dam Safety Grants FEMA.gov .				
County Response: County will consider adding content to meet the HHPD Grant Program requirements in subsequent updates.				
C2: Table 5-2: Planning and Regulatory Capability states that all municipalities within Chester County participate in the NFIP and pages 5-9 to 5-11 describe how each of the municipalities meet NFIP requirements, but supporting documentation (the completed NFIP survey) in Appendix D is only provided for roughly 27 of the 73 municipalities. Please add the remaining 46 NFIP surveys to Appendix D or update the text of Section 5 to explain why this information cannot be included.				
County Response: Added text to the fourth paragraph of the "Participation in the National Flood Insurance Program" section on page 5-9.				
C4: On page 6-13 include the in-text acronym for Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, and Education and Awareness Programs, since these acronyms are used in the "Mitigation Categories" column of Table 6-4.				
County Response: Added to the bullets at the beginning of Section 6.3. They are also defined in the notes under "Mitigation Category" under Table 6-4.				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Sections 2.2, 2.3, 2.4; Section 4.4.4	X		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Sections 6.1.1, 6.1.2, 6.1.3 (Additional Past Mitigation Accomplishments not identified in previous update), Section 6.4.1	X		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Sections 6.1.1, 6.1.2, 6.2.1, 6.2.2, 6.4.1, 6.4.2	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT D: REQUIRED REVISIONS</u>				
<u>ELEMENT D: RECOMMENDED REVISIONS</u>				
D1: Section 2, page 2-14, Table 2-5 displays that between 2010 and 2018, the number of owner-occupied housing units decreased significantly from 139,328 to 14,627. Through the planning process, did the County discern why this significant shift has occurred? Consider including narrative to explain this change. County Response: A digit was missing from the original number. Updated the table with correct 2018 numbers.				
<u>ELEMENT E. PLAN ADOPTION</u>				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Section 8, Appendix F (to include formal adoption resolutions upon receipt of APA designation)			X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Section 3.5 (Table 3-2 to be completed upon receipt of APA designation), Section 8, Appendix F (to include formal adoption resolutions upon receipt of APA designation)			X
<u>ELEMENT E: REQUIRED REVISIONS</u>				
<u>OPTIONAL: HIGH HAZARD POTENTIAL DAM RISKS</u>				
HHPD1. Did Element A4 (planning process) describe the incorporation of existing plans, studies, reports, and technical information for eligible high hazard potential dams?	Section 4.3.1; Appendix A			x
HHPD2. Did Element B3 (risk assessment) address eligible HHPDs?	Section 4.3.1			x
HHPD3. Did Element C3 (mitigation goals) include mitigation goals to reduce long-term vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?	Section 6.2.1; Section 6.2.2, specifically Objectives 1.2 and 2.1, Pages 6-12 to 6-13, Table 6-4		X	

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
HHPD4. Did Elements C4-C5 (mitigation actions) address HHPDs prioritize mitigation actions to reduce vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?	Section 6.4, specifically Tables 6-4, 6-5, and 6-6	X		
<u>REQUIRED REVISIONS TO MEET THE OPTIONAL HIGH HAZARD POTENTIAL DAMS REQUIREMENTS</u>				
<u>RECOMMENDED REVISIONS TO MEET THE OPTIONAL HIGH HAZARD POTENTIAL DAMS REQUIREMENTS</u>				
County Response: County will consider adding content to meet the HHPD Grant Program requirements in subsequent updates.				
HHPD1: Describe how the state dam safety agency coordinated with the jurisdiction(s) and/or local dam owners.				
To address this recommendation, consider adding narrative that explains the Chester County Water Resources Authority's role as a dam owner and how the Pennsylvania Department of Environmental Protection (PADEP) has coordinated with the Water Resources Authority's or other Chester County dam owners.				
HHPD1: When dam safety coordination is limited, explain the limitations.				
HHPD2: If readily available, add EAP approval date and dam date of construction data to table 4.3.1-3 Dams in Chester County. If unable, add narrative explaining why this information could not be included.				
HHPD2: Provide a summary description of All Dam Risk, namely incremental risk and non-breach risk (residual risk is described on page 4.3.1-8). Relevant definitions from the FY20 Rehabilitation of High Hazard Potential Dams Grant Program Guidance are below.				
<p><u>Incremental Risk:</u> "The risk (likelihood and consequences) to the pool area and downstream floodplain occupants that can be attributed to the presence of the dam should the dam breach prior or subsequent to overtopping, or undergo component malfunction or misoperation, where the consequences considered are over and above those that would occur without dam breach. The consequences typically are due to downstream inundation, but loss of the pool can result in significant consequences in the pool area upstream of the dam."</p>				
<p><u>Non-Breach Risk:</u> "The risk in the reservoir pool area and affected downstream floodplain due to 'normal' dam operation of the dam (e.g. large spillway flows within the design capacity that exceed channel capacity) or 'overtopping of the dam without breaching' scenarios."</p>				
<p><u>Residual Risk:</u> "The risk that remains after all mitigation actions and risk reduction actions have been completed. With respect to dams, FEMA defines residual risk as "risk remaining at any time" (FEMA, 2015, p A-2). It is the risk that remains after decisions related to a specific dam safety issue are made and prudent actions have been taken to address the risk. It is the remote risk associated with a condition that was judged to not be a credible dam safety issue."</p>				
HHPD2: Include documentation of limitations and the approach to address deficiencies.				
<u>RECOMMENDED REVISIONS UNRELATED TO THE OPTIONAL HIGH HAZARD POTENTIAL DAMS REQUIREMENTS</u>				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
On page 4.3.1-5, in Table 4.3.1-3, add the missing "Class" information for the Pine Grove Dam, or explain why the information is missing. County Response: Added the class value to the table.				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

Plan Strengths

Organization and Formatting

- The 2021 Chester County Hazard Mitigation Plan (HMP) is well organized and includes an executive summary.

Element A: Planning Process

- A1: A diverse array of organizations (including municipal agencies, school districts, fire departments, hospitals, healthcare facilities, police departments, emergency medical services, nursing homes, neighboring jurisdictions, chambers of commerce and economic development entities, community organizations, watershed and environmental advocate organizations, water suppliers, public transportation, and additional stakeholders) were invited to participate in the Chester County HMP. According to page 3-9, of the organizations invited to take part, 60 participated in this HMP update. Appendix C provides supporting documentation from the HMP meetings and planning process engagements.

- A2: Each municipality was engaged in the planning process through worksheets, surveys (namely the Hazard/Risk Identification Survey, Risk Factor Analysis Survey, Capabilities Assessment Survey, NFIP Survey, and Mitigation Strategy 5-Year Plan Review Worksheet), or via events. Eight public and planning meetings were held to advance the HMP's development and integrate feedback.

- A2: (**Best Practice**) The planning team conducted direct outreach by phone or conducted one-on-one meetings with municipalities who were unable to attend HMP events or who had questions about worksheets, participation requirements, the planning process, or mitigation project selection. According to page 3-8 of the HMP, "58 municipalities in Chester County had representatives attending at least one meeting; the other 15 participating municipalities were contacted individually."

- A4 (**Best Practice**): The "Data Wish List" within Appendix C, demonstrates an excellent inventory of County data sources and gaps. According to Table 6-2: Past Mitigation Action Status, Chester County's municipalities are working to address these gaps by upgrading and developing a "countywide GIS database that incorporates county infrastructure, critical facilities, land use, and hazards zones."

Element B: Risk Assessment

- B1: The HMP profiles and analyzes the risks associated with a diverse array of 19 hazards (10 natural and 9 human-caused).

- B3: (**Best Practice**) Pages 4.3.7-6 to 7, describe municipality specific flooding problem areas (an excellent source of potential mitigation project ideas) for 16 counties.

- B3: (**Best Practice**) Page 4.3.2-11 provides a succinct analysis of climate impacts to Chester County with regard to Drought hazard risks.

- B3: As demonstrated by *Table 4.4-1 Summary of Risk Assessment Analyses*, the HMP provides distinct and detailed risk analyses for each profiled hazard (an exposure analysis, HAZUS analysis, or qualitative analysis was conducted).
- B3: (**Best Practice**) In section 4.3.7, Risk Assessment – Flood, Flash Flood, Ice Jam, detailed and well notated municipality-specific maps for each of the 73 municipalities are provided. These products provide a robust depiction of community flood hazard risk by displaying areas of proposed development, the 100 year and 500 year annual chance flood event special flood hazard area, critical and community lifeline facilities such as police stations, education facilities, child care facilities, and government installations, Emergency management services, Hazmat facilities, electrical/power stations, dams, bridges, airports, communication stations, potable water facilities, fire stations, and rail stations. The products also depict major transportation conduits such as rail lines, state, interstate, and US route roads, jurisdictional boundaries, water bodies, historic properties, and other notable assets such as oil facilities, military installations, national gas facilities, food banks, correctional facility, bus stations, bridges airport, major businesses, religious institutions, and senior facilities.
- HHPD2: (**Best Practice**) *Table 4.3.1-6 Estimated General Building Stock Exposure to Dam Failure*, provides jurisdiction-specific impacts of dam inundation by number of buildings impacted, each jurisdiction’s inundation impacts based on Replacement Cost Value (RCV), and depicting the percentage of buildings impacted vs the % of buildings in each jurisdiction total. The inclusion of *Table 4.3.1-7 Critical Facilities and Utilities within the Dam Inundation Zone* (by jurisdiction) further bolsters the quality of the Dam Failure hazard’s risk assessment. Notably, the HMP concluded that there “is a total of 5,074 buildings vulnerable to dam failure. Approximately 32 percent of these buildings sit within the Borough of Downingtown, which equates to \$1.5 billion in replacement cost value.”
- HHPD2: (**Best Practice**) Population at Risk (within dam inundation areas) data is provided for all 73 jurisdictions via *Table 4.3.1-5: Estimated Chester County Population Exposed to Dam Inundation Areas*.
- HHPD2: Multijurisdictional impacts of Dam Failure (particularly HHPD failure) are addressed on page 4.3.1-7 which states that, “the Beaver Creek Dam is projected to be the most significant due to the potential impact of a dam failure from this dam. Failure of this dam would create a rush of water that would impact residents in East Caln Township, Caln Township, East Brandywine Township, Downingtown Borough, and West Bradford Township.”

Element C: Mitigation Strategy

- C2: (**Best Practice**) The HMP includes Table 5-1: Community Assistance Visits (CAV) which lists the CAV date, municipality, and CID data for CAVs conducted throughout Chester County.
- C5: (**Best Practice**) Detailed and methodical mitigation action prioritization information is detailed in Table 6-5: Evaluation of Mitigation Actions and Table 6-6: Prioritization Scoring of Mitigation Actions (Prioritization Methodology).

- HHPD3: (**Best Practice**) The HMP’s mitigation strategy includes 86 Dam Failure mitigation actions (23 of which for Downingtown Borough, the jurisdiction the HMP identified as most significantly at risk to HHPD).

Element D: Plan Review, Evaluation, and Implementation

- D1: A sound analysis of population density impacts is provided on page 2-6.
- D1: (**Best Practice**) On pages 4.3.7.4-43 to 44, *Table 4.3.7-13 Developed Residential and Non-Residential Land Use Exposed to 1 Percent and 0.2 Percent Annual Chance Flood Event Hazard Area*, provides a succinct and informative summary of Chester County flood hazard exposure with respect to residential and non-residential land.
- D2: (**Best Practice**) In Section 7.2.2, the HMP establishes annual plan review meetings as a means to collect additional jurisdictional mitigation project data and evaluate plan effectiveness (mitigation action progress and goal realization). The HMP (page 7-3) includes a list of 11 performance-based indicators that will be used to assess plan effectiveness.

Opportunities for Improvement

Element A: Planning Process

- A1: The Chester County HMP update timeline provided in Appendix C states that the planning process was planned to kick off around 2/5/2020 (kick off meeting held 2/20/2020) and end (submit draft to PEMA for review) by July 31, 2020. Consider beginning the planning process 2 years prior to HMP expiration per the HMP planning wheel below.



Element C: Mitigation Strategy

- C3: For the next HMP update, consider updating “Objective 2.2: Acquire, relocate, elevate, and/or retrofit existing structures, including repetitive loss properties, located in hazard areas,” by adding “**and severe repetitive loss properties**” after repetitive loss properties.

- C4: For the next HMP update, consider encouraging each municipality to identify and prioritize at least one action from each of the 4 mitigation action categories on page 6-13 and 6-14.
- C5: For the next HMP update, work to obtain “Sponsoring Agencies” information for the mitigation actions in Table 6-4 that do not include this data.

Resources for Implementing Your Approved Plan

Consider utilizing the following resources to bolster future hazard mitigation plan updates and advance community mitigation goals.

- FEMA: [National Risk Index \(NRI\) for Natural Hazards](#)
- FEMA: [Resilience Analysis and Planning Tool \(RAPT\)](#)
- FEMA: Region 3 Conducting Annual Hazard Mitigation Plan Reviews Resource
- FEMA: Region 3 High Hazard Potential Dams State and Local Mitigation Planning Tips Resource
- FEMA: Region 3 Checking In On The NFIP Resource
- FEMA: [Guides to Expanding Mitigation](#)
- Resilient Nation Partnership Network, NOAA, & FEMA: [Building Alliances for Equitable Resilience Resource \(April 2021\)](#)
- FEMA: Protect Your Home from Flooding, Low Cost Project You Can Do Yourself Resource
- FEMA: [“How Community Lifelines and Infrastructure Planning are Essential to Mitigation Plans” Blog Post \(October 2019\)](#)

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdiction that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were ‘Met’ or ‘Not Met,’ and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/township/village/ etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Chester County	County	Gabby Ratliff	601 Westtown Road Suite 012 West Chester, PA 19380	gratliff@chesco.org	610-344-5042	Y	Y	Y	Y	N	N/A
2	Atglen Borough	Borough	Caren Andrews	120 W. Main St. Atglen, PA 19310	manager@atglen.org	610-593-6854	Y	Y	Y	Y	N	N/A
3	Avondale Borough	Borough	Rebecca A. Brownback	110 Pomeroy Ave. Avondale, PA 19311	secretary_avondale-boro@comcast.net	610-268-8501	Y	Y	Y	Y	N	N/A
4	Birmingham Township	Township	Quina P. Nelling	1040 W. Street Road, West Chester, PA 19382	birminghamtwp@comcast.net	610-793-2600	Y	Y	Y	Y	N	N/A
5	Caln Township	Township	Kristen Denne	252 Municipal Drive, Thorndale, PA 19372	kdenne@calntownship.org	610-384-0600	Y	Y	Y	Y	N	N/A
6	Charlestown Township	Township	Linda M. Csete	4030 Whitehorse Rd, Devault, PA 19432	admin1@charlestown.pa.us	610-240-0326	Y	Y	Y	Y	N	N/A
7	Coatesville City	City	James Logan	One City Hall Place, Coatesville, PA 19320	jlogan@coatesville.org	610-384-0300	Y	Y	Y	Y	N	N/A
8	Downingtown Borough	Borough	Stephen Sullins	4 W. Lancaster Avenue, Downingtown, PA 19335	ssullins@downingtown.org	610-269-0344	Y	Y	Y	Y	N	N/A
9	East Bradford Township	Township	Mandie Cantlin	666 Copeland School Rd. West Chester, PA 19380	mcantlin@eastbradford.org	610-436-5108	Y	Y	Y	Y	N	N/A
10	East Brandywine Township	Township	Lisa Taraschi	1214 Horseshoe Pike, Downingtown, PA 19335	lisa@ebrandywine.org	610-269-8230	Y	Y	Y	Y	N	N/A

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							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
11	East Caln Township	Township	Barbara Kelly	110 Bell Tavern Rd., Downingtown, PA 19335	bkelly@eastcalntownship.com	610-269-1989	Y	Y	Y	Y	N	N/A
12	East Coventry Township	Township	David Kraynik	855 Elliswoods Road, Pottstown, PA 19465	info@eastcoventry-pa.gov	610-495-5443	Y	Y	Y	Y	N	N/A
13	East Fallowfield Township	Township	Scott M. Swichar	2264 Strasburg Road, East Fallowfield, PA 19320	sswichar@eastfallowfield.org	610-384-7144	Y	Y	Y	Y	N	N/A
14	East Goshen Township	Township	Louis (Rick) Smith	1580 Paoli Pike, West Chester, PA 19380	rsmith@eastgoshen.org	610-692-7171	Y	Y	Y	Y	N	N/A
15	East Marlborough Township	Township	Neil Lovekin	721 Unionville Road, Kennett Square, PA 19348	NLovekin@eastmarlborough.org	610-444-0725	Y	Y	Y	Y	N	N/A
16	East Nantmeal Township	Township	Susan Rutherford	3383 Conestoga Rd., Glenmoore, PA 19343	eastnant@ptd.net	610-458-5780	Y	Y	Y	Y	N	N/A
17	East Nottingham Township	Township	Kelli Karlton	158 Election Road, Oxford, PA 19363	eastnottingham@eastnottingham.org	610-932-8494	Y	Y	Y	Y	N	N/A
18	East Pikeland Township	Township	Kimberly Moretti	1158 Rapps Dam Road, Phoenixville, PA 19460	manager@eastpikeland.org	610-933-1770	Y	Y	Y	Y	N	N/A
19	East Vincent Township	Township	Catherine Ricardo	262 Ridge Road, Spring City, PA 19475	manager@eastvincent.org	610-933-4424	Y	Y	Y	Y	N	N/A
20	East Whiteland Township	Township	John Nagel	209 Conestoga Road, Frazer, PA 19355	jnagel@eastwhiteland.org	610-648-0600	Y	Y	Y	Y	N	N/A
21	Easttown Township	Township	Eugene Briggs, Jr.	566 Beaumont Road, Devon, PA 19333	ebriggs@easttown.org	610-687-3000	Y	Y	Y	Y	N	N/A
22	Elk Township	Township	Terri Kukoda	953 Chesterville Rd, Lewisville, PA 19351	elktwpchester@gmail.com	610-255-0634	Y	Y	Y	Y	N	N/A
23	Elverson Borough	Borough	Lori Kolb	101 S. Chestnut St., Elverson, PA 19520	secretary@elversonboro.org	610-286-6420	Y	Y	Y	Y	N	N/A
24	Franklin Township	Township	Joan McVaugh	20 Municipal Drive, Landenberg, PA 19350	info@franklintownship.us	610-255-5212	Y	Y	Y	Y	N	N/A
25	Highland Township	Township	Barbara Davis	100 Five Point Rd., Coatesville, PA 19320	highlandtwp@verizon.net	610-857-1791	Y	Y	Y	Y	N	N/A

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26	Honey Brook Borough	Borough	Tricia Swinty	71 Pequea Avenue, Box 249, Honey Brook, PA 19344	info@hbboro.net	610-273-2020	Y	Y	Y	Y	N	N/A
27	Honey Brook Township	Township	Steven C. Landes	500 Suplee Road, Honey Brook, PA 19344	manager@honeybrooktwp.org	610-273-3970	Y	Y	Y	Y	N	N/A
28	Kennett Square Borough	Borough	Rachel J. Berkowitz	120 Marshall St. Kennett Square, PA 19348	rberkowitz@kennettsq.org	610-444-6020	Y	Y	Y	Y	N	N/A
29	Kennett Township	Township	Eden Ratliff	801 Burrows Run Road, Chadds Ford, PA 19317	eden.ratliff@kennett.pa.us	610-388-1300	Y	Y	Y	Y	N	N/A
30	London Britain Township	Township	Carolyn Matalon	81 Good Hope Road, Landenberg, PA 19350	carolyn.londonbritaintwp@comcast.net	610-255-0388	Y	Y	Y	Y	N	N/A
31	London Grove Township	Township	Ken Battin	372 Rose Hill Road, West Grove, PA 19390	kbattin@londongrove.org	610-345-0100	Y	Y	Y	Y	N	N/A
32	Londonderry Township	Township	Janice H. Hearne	103 Daleville Road, Cochranville, PA 19330	londonderrytownship@zoominternet.net	610-869-2138	Y	Y	Y	Y	N	N/A
33	Lower Oxford Township	Township	Deborah Kinney	220 Township Road, Oxford, PA 19363	loweroxfordtwp@zoominternet.net	610-932-8150	Y	Y	Y	Y	N	N/A
34	Malvern Borough	Borough	Christopher Bashore	1 E. First Avenue, Suite 3, Malvern, PA 19335	cbashore@malvern.org	610-644-2602	Y	Y	Y	Y	N	N/A
35	Modena Borough	Borough	Victoria Cloud	5 Woodland Ave. Modena, PA 19358	secretary@boroughofmodenapa.org	610-384-6777	Y	Y	Y	Y	N	N/A
36	New Garden Township	Township	Ramsey Reiner	299 Starr Road, Landenberg, PA 19350	rreiner@newgarden.org	610-268-2915	Y	Y	Y	Y	N	N/A
37	New London Township	Township	Trish Fagan	902 State Road, New London, PA 19360	newlondontwp@comcast.net	610-869-8658	Y	Y	Y	Y	N	N/A
38	Newlin Township	Township	Gail Abel	1751 Embreeville Rd. Coatesville, PA 19320	info@newlintownship.org	610-486-1140	Y	Y	Y	Y	N	N/A
39	North Coventry Township	Township	Erica L. Batdorf	845 S. Hanover Street, Pottstown, PA 19465	twpmgr@northcoventry.us	610-323-1694	Y	Y	Y	Y	N	N/A
40	Oxford Borough	Borough	Brian H Hoover	401 Market St. Oxford, PA 19363	oxfordboro@zoominternet.net	610-932-2500	Y	Y	Y	Y	N	N/A
41	Parquesburg Borough	Borough	Joseph S. Reali	315 W. First Avenue, Parkesburg, PA 19365	jreali@parquesburg.org	610-857-2616	Y	Y	Y	Y	N	N/A

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42	Penn Township	Township	Caitlin Ianni	260 Lewis Road, West Grove, PA 19390	Office@penntownship.us	610-869-9620	Y	Y	Y	Y	N	N/A
43	Pennsbury Township	Township	Kathleen Howley	702 Baltimore Pike, Chadds Ford, PA 19317	khowley@pennsbury.pa.us	610-388-7323	Y	Y	Y	Y	N	N/A
44	Phoenixville Borough	Borough	E. Jean Krack	351 Bridge Street, Phoenixville, PA 19460	manager@phoenixville.org	610-933-8801	Y	Y	Y	Y	N	N/A
45	Pocopson Township	Township	Susan Simone	740 Denton Hollow Rd., West Chester, PA 19382	secretary@pocopson.org	610-793-2151	Y	Y	Y	Y	N	N/A
46	Sadsbury Township	Township	Linda Shank	2920 Lincoln Hwy., Sadsburyville, PA 19369	sadsburytownship@comcast.net	610-857-9503	Y	Y	Y	Y	N	N/A
47	Schuylkill Township	Township	Madeline Harbison	111 Valley Park Road, Phoenixville, PA 19460	admin@schuylkilltpw.org	610-933-5843	Y	Y	Y	Y	N	N/A
48	South Coatesville Borough	Borough	Allen Smith	136 Modena Road, South Coatesville, PA 19320	asmith@south-coatesville.org	610-384-1700	Y	Y	Y	Y	N	N/A
49	South Coventry Township	Township	Amanda Shaner	1371 New Philadelphia Rd, Pottstown, PA 19465	secretary@southcoventry.org	610-469-0444	Y	Y	Y	Y	N	N/A
50	Spring City Borough	Borough	Dennis Rittenhouse	6 S. Church Street, Spring City, PA 19475	mdscboro@hotmail.com	610-948-3660	Y	Y	Y	Y	N	N/A
51	Thornbury Township	Township	Judy Lizza	8 Township Drive, Cheyney, PA 19319	JLizza@Thornburytpw.com	610-399-1425	Y	Y	Y	Y	N	N/A
52	Tredyffrin Township	Township	William F. Martin	1100 Duportail Road, Berwyn, PA 19312	tredyffrin@tredyffrin.org	610-644-1400	Y	Y	Y	Y	N	N/A
53	Upper Oxford Township	Township	Jane L. Daggett	1185 Limestone Road, Oxford, PA 19363	upperoxford@hotmail.com	610-932-9233	Y	Y	Y	Y	N	N/A
54	Upper Uwchlan Township	Township	Tony Scheivert	140 Pottstown Pike, Chester Springs, PA 19425	tscheivert@upperuwchlan-pa.gov	610-458-9400	Y	Y	Y	Y	N	N/A
55	Uwchlan Township	Township	Scott Greenly	715 N. Ship Road, Exton, PA 19341	Sgreenly@uwchlan.com	610-363-9450	Y	Y	Y	Y	N	N/A
56	Valley Township	Township	Scott T. Piersol	890 W. Lincoln Hwy., Coatesville, PA 19320	manager@valleytownship.org	610-384-5751	Y	Y	Y	Y	N	N/A

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57	Wallace Township	Township	Betty Randzin	1250 Creek Road, Glenmoore, PA 19343	wallace@wallacetwp.org	610-942-2880	Y	Y	Y	Y	N	N/A
58	Warwick Township	Township	Joan Grimley	2500 Ridge Road, Elverson, PA 19520	email@warwickchester.org	610-286-5557	Y	Y	Y	Y	N	N/A
59	West Bradford Township	Township	Justin V. Yaich	1335 Campus Drive, Downingtown, PA 19335	jyaich@westbradford.org	610-269-4174	Y	Y	Y	Y	N	N/A
60	West Brandywine Township	Township	Linda Formica	198 Lafayette Road, Coatesville, PA 19320	lformica@wbrandywine.org	610-380-8200	Y	Y	Y	Y	N	N/A
61	West Caln Township	Township	Thomas Siedenbuehl	721 W. King's Hwy. Wagontown, PA 19376	TSiedenbuehl@WestCaln.org	610-384-5643	Y	Y	Y	Y	N	N/A
62	West Chester Borough	Borough	Michael A. Perrone	401 E. Gay Street, West Chester, PA 19380	mperrone@westchester.com	610-692-7574	Y	Y	Y	Y	N	N/A
63	West Fallowfield Township	Township	Gina M. Wheeler	3095 Limestone Road, Cochranville, PA 19330	wfaltwp@gmail.com	610-593-5916	Y	Y	Y	Y	N	N/A
64	West Goshen Township	Township	Casey LaLonde	1025 Paoli Pike, West Chester, PA 19382	twp@westgoshen.org	610-696-5266	Y	Y	Y	Y	N	N/A
65	West Grove Borough	Borough	Greg McCummins	117 Rosehill Avenue, West Grove, PA 19390	gmccummings@westgroveborough.org	610-869-2792	Y	Y	Y	Y	N	N/A
66	West Marlborough Township	Township	Shirley K. Walton	1300 Doe Run Road, Coatesville, PA 19320	hugh@hughloftingtimberframe.com	610-363-5986	Y	Y	Y	Y	N	N/A
67	West Nantmeal Township	Township	Deborah M. Kolpak	455 N. Manor Road, Elverson, PA 19520	wntwp@ptd.net	610-286-9722	Y	Y	Y	Y	N	N/A
68	West Nottingham Township	Township	Candace Miller	100 Park Road, Nottingham, PA 19362	westnottinghamtwp@zoominternet.net	610-932-4072	Y	Y	Y	Y	N	N/A
69	West Pikeland Township	Township	Jim Wendelgass	1649 Art School Road, Chester Springs, PA 19425	jwendelgass@westpikeland.com	610-827-5300	Y	Y	Y	Y	N	N/A
70	West Sadsbury Township	Township	Patti Piersol	6400 Moscow Road, Parkesburg, PA 19365	wsadstwp@comcast.net	610-857-5969	Y	Y	Y	Y	N	N/A
71	West Vincent Township	Township	John Granger	729 St. Matthews Road, Chester Springs, PA 19425	jgranger@westvincenttwp.org	610-458-1601	Y	Y	Y	Y	N	N/A

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72	West Whiteland Township	Township	Mimi Gleason	101 Commerce Drive, Exton, PA 19341	mgleason@westwhitel and.org	610-363-9525	Y	Y	Y	Y	N	N/A
73	Westtown Township	Township	Jon Altshul	1039 Wilmington Pike, West Chester, PA 19382	jaltshul@westtown.org	610-692-1930	Y	Y	Y	Y	N	N/A
74	Willistown Township	Township	Sally Slook	688 Sugartown Road, Malvern, PA 19355	sslook@willistown.pa.us	610-647-5300	Y	Y	Y	Y	N	N/A



MEETING NOTES

Meeting	Chester County Hazard Mitigation Plan (HMP) Steering Committee Kickoff Meeting		
Date	February 20, 2020	Time	2:00 – 4:15 p.m.
Location	Chester County Government Services Center, Conference Room 42, 601 Westtown Road, West Chester, PA		
Attendees	Alison Miller, Director, Planning and Logistics, Chester County Department of Emergency Services (DES)		
	Tony Przychodzien, Radiological Emergency Preparedness Coordinator, Chester County DES		
	Gabby Ratliff, Emergency Planning Coordinator, Chester County DES		
	Dave Sekkes, GIS Database Administrator, Chester County DES		
	William Turner, Deputy Director, Emergency Management, Chester County DES		
	Janet Zeis, Community Resilience Coordinator, Chester County DES		
	Robyn Slater, Planner, Chester County Health Department		
	Chris Patriarca, Senior Community Planner, Chester County Planning Commission		
	Carol Stauffer, Assistant Director, Chester County Planning Commission		
	Craig Thomas, Field Engineering and Operations Manager, Chester County Water Resources Authority		
	Cory Trego, Water Resources Planner, Chester County Water Resources Authority		
	Tim Hubbard, Emergency Management Coordinator (EMC) for Charlestown Township, and Chief Security Officer for the Downingtown Area School District		
	Stefanie Otley, Planner, Tetra Tech, Inc. (Tetra Tech)		
Tony Subbio, Project Manager, Tetra Tech			

Discussion Points

This section summarizes each discussion point addressed during the Steering Committee Kickoff Meeting.

Introductions

Ms. Ratliff welcomed the group. Attendees introduced themselves and identified any particular concerns or areas of focus for the updated HMP, including the following:

- Mr. Turner wants to ensure that the county has a usable, implementable plan that meets Emergency Management Accreditation Program (EMAP) standards.
- Mr. Trego reported that he has reviewed the municipalities' information in the existing HMP.
- Ms. Stauffer wants to ensure that the plan addresses land use, transportation, and pipeline issues.
- Ms. Zeis asked that the plan integrate equity.
- Mr. Patriarca reported that pipelines are a concern across the county.
- Mr. Thomas is concerned about dam failure and other human-caused hazards.



MEETING NOTES

Overview of Hazard Mitigation

Mr. Subbio provided a brief overview of hazard mitigation and the funding available from the Federal Emergency Management Agency (FEMA).

Project Scope Review

Mr. Subbio reviewed the planning process, as described in the scope of work. This section summarizes discussions that were held during the meeting.

Mr. Subbio discussed the formation of the Planning Team, which is the group of representatives from municipalities and stakeholder agencies involved with the HMP update process. Two sessions of the Planning Team Kickoff Meeting will be held on March 13, 2020. The first session will be for municipal representatives; the second will be for other stakeholders.

PEMA's requirements for municipal participation include providing information and attending at least one meeting during the planning process. Meetings conducted by existing groups and associations can be counted as planning meetings if the HMP is added to the agenda and meeting notes are taken to document relevant discussions during the meeting. Relevant meetings and groups include the following:

- Chester County Association of Township Officials (CATO)
- Chester County Fire Chiefs Association
- Chester County Managers Consortium
- Chester County PA Police Chiefs Association
- The DelChester Public Works Association
- DES EMC Training Sessions

Mr. Subbio reviewed the four information-gathering worksheets that each municipality will be asked to complete.

Ms. Ratliff provided information to Mr. Subbio to address Tetra Tech's GIS Wish List. Mr. Subbio reviewed the list with attendees. To identify water towers in the county, the building footprint database may be able to be queried for height and roundness.

Mr. Sekkes described the ability to develop a mapping system that can be put on the county's website, on which individuals can identify problem areas throughout the county.

Project Schedule Review

Mr. Subbio reviewed the project schedule. The draft of the updated HMP will be completed by the end of June 2020, assuming that information is provided to Tetra Tech in a timely manner.



MEETING NOTES

Planning Team Members

The following organizations were discussed and will be invited to participate in the planning process by serving on the Planning Team:

- County departments, including
 - Department of Computing and Information Services
 - Health
 - Human Services
 - Open Space Preservation
 - Parks and Trails
 - Prison
- Municipal officials
- The Penn State University Cooperative Extension office
- The Hospital and Healthsystem Association of Pennsylvania's (HAP) coordinator for the Southeastern Healthcare Coalition
- Inpatient drug addiction rehabilitation facilities
- Nursing homes
- Public schools and school districts
- Private schools
- The Chester County Economic Development Council
- The active chambers of commerce in the county
- Media
 - Daily Local News
 - Chester County Press
 - Public information officers from Chester County and the Chester County DES
- Chester First
- Chester County Pipeline Safety Advisory Board
- The Chester County Local Emergency Planning Committee (LEPC)
- The Pipeline Safety Coalition
- Transportation Management Association of Chester County (TMACC) paratransit
- The Delaware Valley Regional Planning Commission
- La Comunidad Hispánica
- Utility Companies
 - PECO
 - Water and wastewater authorities
 - Penn American Water
 - Aqua Pennsylvania
 - Chester Water Authority
- Commonwealth Agencies
 - Pennsylvania Department of Agriculture
 - Pennsylvania Department of Environmental Protection (PA DEP)
 - Pennsylvania Historical and Museum Commission



MEETING NOTES

- Pennsylvania Department of Transportation (PennDOT)
- Pennsylvania Emergency Management Agency (PEMA)
- Pennsylvania State Police (PSP)
- The Pennsylvania Turnpike Commission
- Federal Departments
 - Federal Emergency Management Agency, Region III
 - United States Department of Agriculture
- Neighboring Counties
 - Planning departments
 - Departments of emergency management

Hazards of Concern

The following hazards will be profiled in the updated HMP:

1. Dam Failure
2. Drought and Water Supply Deficiencies
3. Earthquake
4. Environmental Hazards (hazardous materials)
5. Extreme Temperatures
6. Floods, Flash Floods, and Ice Jams
7. Hurricane and Tropical Storms
8. Invasive Species
9. Nuclear Incidents
10. Opioid Epidemic
11. Pandemic
12. Pipeline Incidents (separate from Environmental Hazards)
13. Radon Exposure
14. Structural Fires
15. Terrorism (including cyber-attack, conventional/improvised bombs, and armed attacks)
16. Tornadoes and Windstorms (including thunderstorms)
17. Transportation Accidents
18. Utility Failure
19. Winter Storms

Next Steps

- Steering Committee members will send any relevant plans, studies, or documents to Mr. Subbio.
- The Planning Team Kickoff Meetings will be conducted on March 13, 2020.
- Mr. Subbio and Ms. Ratliff will develop a strategy for reaching out to the municipalities and other stakeholders.
- Mr. Subbio and Ms. Ratliff will coordinate with the county and Tetra Tech GIS staff to share the GIS data needed.
- Tetra Tech will begin developing the hazard profiles.

The meeting adjourned at 4:15 p.m.



AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Steering Committee Kickoff Meeting

Thursday, February 20, 2020 | 2:00 – 4:00 p.m.

-
1. **Introductions**

 2. **Overview of Hazard Mitigation**

 3. **Project Scope Review**

 4. **Project Schedule Review**

 5. **Planning Team Members**

 6. **Hazards of Concern**
 - a. 2015 HMP Hazards
 - b. One Additional

 7. **Next Steps**
 - a. Document and Data Request
 - b. GIS Data
 - c. Initial Planning Team Meeting
 - d. Risk Assessment Update

 8. **Questions**



Hazard Identification and Risk Evaluation Worksheet

Name: _____ Title: _____

Jurisdiction: _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought		
Earthquake		
Extreme Temperatures		
Flood, Flash Flood, and Ice Jam		
Hurricane and Tropical Storm		
Radon Exposure		
Thunderstorm		
Tornado and Windstorm		
Winter Storm		
Human-made Hazards		
Armed Attacks		
Civil Disturbance		
Conventional/Improvised Bombs		
Cyber Terrorism		
Dam Breaches		



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions		
Fires		
Hazard Material Releases		
Nuclear Incidents		
Transportation Accidents		

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _____

Point of Contact Name and Title: _____

Phone: _____

E-mail: _____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations					



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance					
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code					
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)				
Planners or engineers (with natural and/or human caused hazards knowledge)				
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)				
Emergency Manager				
NFIP Floodplain Administrator				
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis				
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming				
Community Development Block Grants (CDBG)				
Special Purpose Taxes				
Gas / Electric Utility Fees				
Water / Sewer Fees				
Stormwater Utility Fees				
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)				
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.				
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			
Administrative and Technical Capability			
Financial Capability			
Education and Outreach			

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: _____

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.		
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.		
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.		
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.		
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.		



2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.		

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.		
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.		
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.		

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County						
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction						
AH-4. Provide regular updates to the countywide Mass Care Plan						
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities						
AH-8. Arrange and hold hazard mitigation workshops for county residents						
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division						
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters						
AH-11. Enhance the communications equipment between the County and the municipalities						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures						
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities						
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events						
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads						
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances						
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities						
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						
F-12. Continue to maintain the stream gauges						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County						
F-14. Install stream gauges if an additional area is identified to benefit from one						
F-15. Provide education to the municipalities on flood gauges						
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas						
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris						
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management						
TOR-4. Retrofit critical public facilities with safe rooms						
D-1. Provide public information on the effects of droughts on public and private wells						
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						
PG-1. Encourage security check of bags/coolers at public gathering						
PG-2. Plan for and implement strengthened security at public events						
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events						
PG-7. Utilize temporary mobile camera during large events to monitor safety and security						
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events						
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process						
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure						
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage						
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)						
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						
TRF-7. Provide public education on traffic accident reduction						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County						
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations						
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						

Project Schedule

Subject to Change

Task	Timeframe
Project Management	<ul style="list-style-type: none"> • Project Kickoff Meeting conducted on or about February 5, 2020 • Monthly status reports • Quarterly progress reports submitted to PEMA • Project Closeout Meeting upon FEMA approval of the HMP
Task 1: Organize Resources	<ul style="list-style-type: none"> • Initial Planning Team Meeting conducted on March 2, 2020 • Project website maintained throughout the planning process • Outreach to municipalities and other stakeholders throughout the planning process • Plans and other documents reviewed throughout the planning process
Task 2: Conduct Capability Assessment	<ul style="list-style-type: none"> • Capabilities assessed through completion of the draft HMP
Task 3: Conduct Risk Assessment	<ul style="list-style-type: none"> • Risk assessment conducted from the Initial Planning Team Meeting through mid-May 2020 • Public Planning Team meeting to review the risk assessment conducted on or about May 22, 2020
Task 4: Develop Mitigation Strategy	<ul style="list-style-type: none"> • Goals and objectives updated by the end of May 2020 • Mitigation Strategy Workshop conducted on or about June 11, 2020 • Mitigation actions developed by June 25, 2020
Task 5: Define Plan Maintenance	<ul style="list-style-type: none"> • Plan Maintenance Update Meeting with the HM Committee conducted on or about April 16, 2020 • Plan Maintenance section updated by mid-June 2020
Task 6: Prepare the Updated HMP Draft	<ul style="list-style-type: none"> • Draft completed by June 25, 2020
Task 7: Review and Finalize the Updated HMP Draft	<ul style="list-style-type: none"> • Public comment period from late June through late July 2020 • Public Draft Review Meeting conducted on or about July 29, 2020 • Draft finalized by July 31, 2020
Task 8: Submit the Updated HMP Draft for Formal Review	<ul style="list-style-type: none"> • Draft submitted to PEMA on or about July 31, 2020 • PEMA Review Period from August 3-13, 2020 • Draft HMP updated and submitted to FEMA Region III by August 17, 2020 • FEMA Review Period from August 17 – October 1, 2020 • HM Committee Meeting (teleconference) with PEMA and FEMA mitigation staff to review FEMA comments conducted on or about October 6, 2020 • HMP updated and resubmitted to FEMA Region III by October 13, 2020 • “Approvable Pending Adoption” (APA) granted at the end of October 2020
Task 9: Facilitate Adoption of the Updated HMP	<ul style="list-style-type: none"> • Presentation of the APA HMP to the County Commissioners for adoption at their meeting on November 12, 2020 • Final approval of the HMP by FEMA after at least one municipality also adopts the HMP, expected by mid-December 2020

Data 'Wish List'

It would be preferable if spatial datasets (GIS) provide coverage for the entire county. Please fill out the file format and file name for all data included in the deliverable.

NOTE: If the county indicates **N** under 'County Has the Data,' please state whether the information is not spatially available/available in another format OR if that facility type does not exist in the county.

GIS File (* Denotes first-priority for critical facility; ** for general building stock inventory; *** for priority spatial data)	County Has the Data (Y/N)? And has data been updated ?	Data Received (Y/N)	File Format (Shapefile, Excel, Access, Geodatabase, PDF)	File Name (i.e. police.shp; critical_facilities.xlsx)
Critical Facilities				
Critical / Essential Facilities				
EOCs*	Y		fGDB	Critical_Facilities
Police*	Y		fGDB	Critical_Facilities
Fire*	Y		fGDB	Critical_Facilities
Hospitals and Medical Centers*	Hospitals Only		fGDB	Critical_Facilities
Rescue Stations/EMS/Ambulance*	Y		fGDB	Critical_Facilities
Schools - Public and Private*	Y (Private not updated)		fGDB	Critical_Facilities
Colleges / Universities*	Y		fGDB	Critical_Facilities
Shelters*	N			
Nursing Homes/Senior Care / Senior Centers*	Y (Last update 2016)		fGDB	Critical_Facilities
Municipal Halls*	Y		fGDB	
County Buildings*	Y		fGDB	Critical_Facilities
Correctional Institutions*	Y		fGDB	
Day Care Centers	Y (Last update 2016)		fGDB	Critical_Facilities
Public Health Departments*	Y		fGDB	Critical_Facilities
Public Works Buildings/Highway Departments/Vehicle and Equipment Storage*	N			
Drug and Alcohol Treatment Centers*	N			
Transportation				
Evacuation Routes*	Nuclear Only		fGDB	Nuclear_Evacuation_Routes
Major and Minor Highways (US, State, Interstate, County)	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/chester-county-road-centerlines
Local Streets	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/chester-county-road-centerlines

GIS File (* Denotes first-priority for critical facility; ** for general building stock inventory; *** for priority spatial data)	County Has the Data (Y/N)? And has data been updated ?	Data Received (Y/N)	File Format (Shapefile, Excel, Access, Geodatabase, PDF)	File Name (i.e. police.shp; critical_facilities.xlsx)
Train Stations*	Y		fGDB	Critical_Facilities
Railroad Line (Heavy and Light Rail)	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/railroad-lines
Railroad and Light Rail Facilities - transfer facility, rail yard and stations*	N			
Airports/Heliports*	Y		fGDB	Critical_Facilities
Bus Facilities *	N			
Bridges*	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/bridges
Utilities				
Electric Power Facilities*	Y		fGDB	Nuclear_Power_Plants
Electric Power Transfer Station/Substation*	Y		fGDB	Critical_Facilities
Potable Water Supply Treatment Facilities*	Y		fGDB	Critical_Facilities
Potable Water Wells (Public/Private) *	N			
Potable Water Pump Stations*	N			
Water Towers/Tanks*	N			
Wastewater Treatment Plants*	Y		fGDB	Critical_Facilities
Wastewater Pump Stations*	N			
Natural Gas*	N			
Oil Refineries*	N			
Major Communication Facilities (not cell towers) *	N			
Culverts	N			
Green Infrastructure	N			
Outfalls	N			
Storm Drain Inlets	N			
Subsurface infiltration/detention systems	N			
Other (e.g., manufactured treatment devices)	N			
Miscellaneous – Other facilities not above that you consider critical to operations pre-, during and post- event				
Tier II Facilities/Major Hazmat Facilities*	Y		fGDB	Critical_Facilities
Military Installations*	Y		fGDB	Critical_Facilities
Major Employers*	N			
Historic sites and cultural resources	Y		fGDB	Historic_Resources
Church/Religious	Y		fGDB	Critical_Facilities
Library	Y		fGDB	Critical_Facilities

GIS File (* Denotes first-priority for critical facility; ** for general building stock inventory; *** for priority spatial data)	County Has the Data (Y/N)? And has data been updated ?	Data Received (Y/N)	File Format (Shapefile, Excel, Access, Geodatabase, PDF)	File Name (i.e. police.shp; critical_facilities.xlsx)
Post Office	Y		fGDB	Critical_Facilities
Radio Tower (for emergency response)	Y		fGDB	Critical_Facilities
Polling Site	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/polling-places
Chemical Storage	N			
Spatial Data				
Boundaries				
Municipal Boundaries	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/municipal-boundary
Municipal Utility Authorities	N			
School Districts	Y			School_Districts
Emergency Service Districts (Police/Fire/EMS)	Y			https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/police-response-territory https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/fire-response-territory
Water Service Areas	Y (Unsure of last update)		fGDB	Water_Service_Areas
Water Purveyors	N			
Sewer Service Areas	Y (Unsure of last update)		fGDB	Sewer_Service_Areas
Sole Source Aquifers	N			
Federal Land Areas	N			
Electric Service Territories	N			
Building Stock and Cadastral				
Parcels**	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/parcels
Building Footprints** (Building specific data listed in next table)	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/buildingfootprints2015
Mobile Home Parks**	Y		fGDB	Mobile_Home_Parks
Temporary Housing Sites (for use post-disaster) *	N			
Homeless Shelters*	N			
Hydrology / Hydrography				
Streams and Rivers	Y		fGDB	Streams
Drainage Basins	Y		fGDB	Watersheds
Reservoirs	Y		fGDB	Reservoirs
Dams*	Y		fGDB	Critical_Facilities

GIS File (* Denotes first-priority for critical facility; ** for general building stock inventory; *** for priority spatial data)	County Has the Data (Y/N)? And has data been updated ?	Data Received (Y/N)	File Format (Shapefile, Excel, Access, Geodatabase, PDF)	File Name (i.e. police.shp; critical_facilities.xlsx)
Levees*	N			
Canal	N			
Flood Inundation Areas				
Urban/Stormwater floodprone areas	Y		fGDB	Flood_Prone_Areas
Local detailed flood studies	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/fema-100-year-flood-zones
Dam Break Inundation Areas	Y		fGDB	Dam_Inundations_Zones
New Development				
Major building or infrastructure development over the next 5 years***	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/proposed-land-developments
Major recent developments since the last HMP (spatial)***	Y		fGDB	https://chester-county-s-gis-hub-chesco.hub.arcgis.com/datasets/proposed-subdivisions
New construction/ redevelopment permits since the last HMP (by occupancy class; by year) ***	N			
Priority economic development/redevelopment areas***	N			
Changes in demographics (spatial distribution or countywide statistics)	N			
Buildable land analysis	N			
Mitigation/Resilience Projects (please provide other information as available such as funding source, lead entity, brief scope)				
FEMA-funded projects	N			
Green infrastructure projects	N			
Acquisitions	N			
Elevations	N			
Stormwater	N			
Other mitigation projects	N			
Other				
FEMA/USACE Tiered Evacuation Study results	N			
Socially-vulnerable populations (spatial distribution or countywide statistics)	N			
Sites identified for redevelopment	N			
Land Use and Land Cover	Y (2010)		fGDB	Land_Use_2010
Open Space	Y		fGDB	Parks

GIS File (* Denotes first-priority for critical facility; ** for general building stock inventory; *** for priority spatial data)	County Has the Data (Y/N)? And has data been updated ?	Data Received (Y/N)	File Format (Shapefile, Excel, Access, Geodatabase, PDF)	File Name (i.e. police.shp; critical_facilities.xlsx)
Zoning	Y		fGDB	Zoning
Rainfall/Waterway Gages	Y		fGDB	Rain_Gauges, Stream_Gauges
Historic Wildfire Locations	N			
Contour lines (2-ft, 5-ft, 10-ft)	Y		fGDB	https://www.chesco.org/3486/GIS-Data
Updated LIDAR or DEM	Y		fGDB	http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=382 http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=75

General Building Stock Attributes

We are requesting the Assessor data table(s) or spatial layers, including a unique field to join to the parcel/building footprint GIS data set, to use as part of the risk assessment. We would like to obtain the following attributes (if available) for each building. Where data is not available, assumptions will be made. Data types are in italics for an Access database for integration into HAZUS-MH

Building Attribute:	The County Has Data (Y/N)	Data Sent (Y/N)	Attribute Name (i.e. exterior wall, stories, etc.)	Potential Source for Data
Total square footage (From parcel attribute or calculated from building footprints)	Parcel-level		SHAPE.AREA	Building_Footprints
Construction type (wood, masonry, concrete, steel, etc)	Parcel-level			
Year Built	Parcel-level			
Number of stories	Parcel-level		HEIGHT_CLASS	Building_Footprints
Foundation (crawlspce, basement, slab on grade, fill, pile, pier, solid wall)	Parcel-level			
First finished floor elevation	N			
Occupancy Type/Property Class (residential, commercial, industrial etc)	Parcel-level			
Basement (Y/N) (If yes, is basement finished?)	Parcel-level			
Replacement Cost Value (structure) – will be estimated using RS Means valuations if unavailable	N			
Replacement Cost Value (contents) – will be estimated using RS Means valuations if unavailable	N			
Municipality	Parcel-level			
Address	Parcel-level			
Name Unique ID to join with parcel (if these attributes are in the parcel file)	Parcel-level			
Latitude	N			Derived
Longitude	N			Derived

February 20, 2020

Ms. Mari Radford
Mitigation Planner
U.S. Department of Homeland Security
One Independence Mall
615 Chestnut Street, 6th Floor
Philadelphia, PA 19106

Subject: Request for NFIP Data – Chester County, PA

Dear Ms. Radford:

Chester County and its municipalities are currently working on updating our countywide Hazard Mitigation Plan (HMP). I am the authorized agent for this project.

Chester County is hereby requesting the following NFIP data for use within our planning project:

- Flood insurance policies in force
- Claims paid by the NFIP
- Repetitive Loss (RL) properties
- Severe Repetitive Loss (SRL) properties

We understand that your office typically provides this data in electronic spreadsheet format, with records geo-coded, and request that this information be provided as such.

The county will adhere to any data use restrictions and confidentiality you specify. We recognize that this data must not be distributed to the general public, nor will any part of the list be published in the HMP documents or any other public documents. Specific repetitive loss properties shall not be identified within the HMP, only the general areas where policies, claims and repetitive loss properties exist and their correspondence with NFIP SFHA delineations.

Please forward this data to my attention at the above address at your earliest convenience. If you have any questions on this request, please contact me at (610) 344-5042 or at gratliff@chesco.org. Thank you.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator



CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE
 Steering Committee Kickoff Meeting

SIGN-IN

Thursday, February 20, 2020 | 2:00 - 4:00 p.m.

NAME AND TITLE	AGENCY/ORGANIZATION	E-MAIL ADDRESS	TELEPHONE
Stefanie Ohly, Planner	Tetra Tech	Stefanie.Ohly@tetra-tech.com	717 850 4290
Robyn Slater, Planner	Chester Co. Health Dept	rslater@chesco.org	610 349 5320
Tim Hubbard Enric CSO	Charleston Twp/ Dunningtown School District	Hubbard@dcsd.org	484-614-6119
Tom Przechodni	DES - Chest. C.	tprzechodni@chesco.org	410-344-4555
Lance Zeis	CCDES	lzeis@chesco.org	610 344 5014
Carol Stauffer	Planning	cstauffer@chesco.org	610-344-6285
Dave Sekes, GIS	CCDES	dsekkes@chesco.org	610-344-4485
Cory Trego, Water Resources Planner	CCWRA	ctrego@chesco.org	610-344-5460
Chris Patricia	CCPC	cpatricia@chesco.org	
CRIS THOMAS FIELD ENGINEERING & OPERATIONS MANAGER	CCWRA	CTHOMAS@CHESCO.ORG	610.344.5460





CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE
Steering Committee Kickoff Meeting

SIGN-IN

Thursday, February 20, 2020 | 2:00 - 4:00 p.m.

NAME AND TITLE	AGENCY/ORGANIZATION	E-MAIL ADDRESS	TELEPHONE
Alison Myler Director, Planning & Logistics	CCDES	amyl@chesco.org	610-344-5008
William Turner Deputy Director, EMA	CCDES	wturner@chesco.org	610-344-5011
Tony Subbio, PM	Tetra Tech	tony.subbio@tetratech.com	717-839-5654
Gabby Rath, EMA Planning	CCDES	grath@chesco.org	610-344-5642





MEETING NOTES

Meeting	Chester County Hazard Mitigation Plan (HMP) Planning Team Kickoff Meeting for Municipalities		
Date	March 13, 2020	Time	10:00 – 11:15 a.m.
Location	Webinar		
Attendees	Dave Sekkes, Geographic Information System (GIS) Database Administrator, Chester County Department of Emergency Services (DES)		
	Frank Sullivan, HazMat Chief, Chester County DES		
	Sean Barron, Emergency Management Agency (EMA) Representative, Caln Township		
	Chris Obenchain, Emergency Management Coordinator (EMC), Caln Township		
	Timothy Hubbard, EMC, Charlestown Township		
	Scott Piersol, Township Manager, East Brandywine Township		
	Unidentified Representative, East Coventry Township Police Department		
	Joe Heyman, Sergeant, East Pikeland Township Police Department		
	Loren Nafziger, EMC, East Whiteland Township		
	Barclay Hargreaves, EMC, Elverson Borough and West Nantmeal Township		
	Marclay Hargreaves, Emergency Management Staff, Elverson Borough and West Nantmeal Township		
	Chandler Matlock, Council Member, Honey Brook Borough		
	Unidentified Representative, Borough of Kennett Square		
	Eden Ratliff, Township Manager, Kennett Township		
	Aileen Parish, Supervisor, London Britain Township		
	Unidentified Representative, London Grove Township		
	Deborah Kinney, Secretary-Treasurer and Emergency Management Representative, Lower Oxford Township		
	David Flad, Emergency Coordinator, New London Township		
	Matthew Galamba, EMC, North Coventry Township		
	Jim Marks, Supervisor, North Coventry Township		
	Neil Vaughn, Manager, Parkesburg Borough		
	Michael Hochhaus, EMC, Pennsbury Township		
	Kathleen Howley, Township Manager, Pennsbury Township		
	Kevin Gosselin, EMC, Pocopson Township		
	James Fetterman, Chief, Schuylkill Township		
	Moujan Toloubadei, EMC, Schuylkill Township		
Renee Carey, Supervisor, South Coatesville Borough			
Ramsey Reiner, Manager, South Coatesville Borough			



MEETING NOTES

Lou DiGuiseppe, EMC, Spring City Borough
Judy Lizza, Township Manager, Deputy Zoning Officer, Treasurer, Open Records Officer, Thornbury Township
Matt Baumann, Assistant Township Manager, Tredyffrin Township
Jim Lucas, Codes Director and Fire Marshal, West Bradford Township
Jon Brill, EMC, West Chester Borough
Unidentified Representative, West Chester Borough Police Department
Joe Chico, Deputy EMC, West Pikeland Township
Ernie Holling, Supervisor, West Pikeland Township
Robert Pingar, Manager, Westtown Township
Don Verdiani, EMC, Westtown Township
Martin McKenzie, EMC, Willistown Township
Karen Flad, School Nurse, Avon Grove School District
Gina Guarino Buli, CEO, Renaissance Charter Academy
Stefanie Otley, Planner, Tetra Tech, Inc. (Tetra Tech)
Tony Subbio, Project Manager, Tetra Tech
Nine additional unidentified callers

Discussion Points

This section summarizes each discussion point addressed during the Planning Team Kickoff Meeting For Municipalities. The meeting was held remotely because of the emerging COVID-19 pandemic. Because of the number of municipalities and additional stakeholders in Chester County, separate webinars were conducted for municipal officials and other stakeholders.

Quick Introduction to Hazard Mitigation

Mr. Subbio provided a brief overview of hazard mitigation for attendees. He defined hazard mitigation, and reviewed types of mitigation actions. He described the requirements of the Disaster Mitigation Act of 2000 (DMA 2000) for HMPs, as well as Pennsylvania's requirements. He discussed the Federal Emergency Management Agency's (FEMA) mitigation grants. Finally, he reviewed statistics regarding the benefits of mitigation versus their costs.

Planning Process

Mr. Subbio provided an overview of the HMP planning process, then described the steps in detail. This section summarizes the detailed description of each step.



MEETING NOTES

The first step involves identifying the hazards of concern for Chester County. The hazards of concern that will be analyzed in the HMP are as follows:

- Dam Failure
- Drought and Water Supply Deficiencies
- Earthquake
- Environmental Hazards
- Extreme Temperatures
- Floods, Flash Floods, and Ice Jams
- Hurricane and Tropical Storms
- Invasive Species
- Nuclear Incidents
- Opioid Epidemic
- Pandemic
- Pipeline Incidents
- Radon Exposure
- Structural Fires
- Terrorism
- Tornadoes and Windstorms
- Transportation Accidents
- Utility Failure
- Winter Storms

Hazards of concern are examined in the risk assessment process. After the risk assessment is complete, Tetra Tech and the county will conduct a Risk Assessment Review Meeting to collect feedback on the results.

Tetra Tech and the county will assess municipalities' and stakeholders' capabilities to implement hazard mitigation. These capabilities include plans, regulations, staff expertise, access to internal and external funding, training of key staff, and education and outreach.

Based on the risk assessment and capabilities assessment, plan participants will update the mitigation strategy. Municipalities and other stakeholders will identify mitigation actions they have taken over the last 5 years. The HMP Steering Committee will develop a set of mitigation goals and objectives for the updated HMP. Tetra Tech's planners will work with the County and other stakeholders to identify specific, implementable mitigation actions for inclusion in the updated plan. To that end, a Mitigation Strategy Workshop will be conducted to help participants identify solutions to the problems posed by hazards in the county.

Throughout this process, Tetra Tech will be developing the HMP document. The risk assessment, capabilities assessment, and mitigation strategy will each have their own sections of the HMP. Other sections of the HMP include an updated County Profile, describing the nature of the county and its population; the Planning Process, to document the steps that the County took to update the HMP; and the Plan Maintenance section, to document how the HMP will be reviewed and updated over its 5-year lifespan.

Mr. Subbio then describe the plan review and approval process. He noted that the Pennsylvania Emergency Management Agency (PEMA) usually requests only minor changes, but FEMA almost always asks for substantial changes based on best practices from other jurisdictions in FEMA Region III. Tetra Tech will update the HMP as necessary until it is granted "Approvable Pending Adoption"



MEETING NOTES

(APA) status by FEMA. After that, Chester County and participating municipalities can adopt the HMP, which will be followed by formal approval of the HMP by FEMA.

Review Schedule

Mr. Subbio reviewed the project schedule. The draft of the updated HMP will be complete by the end of June 2020, if information is provided to Tetra Tech in a timely manner.

Introduce Worksheets

Mr. Subbio reviewed the following set of information-gathering worksheets that municipalities are asked to complete:

- Hazard Identification and Risk Evaluation Worksheet
- Capability Assessment Survey
- National Flood Insurance Program (NFIP) Survey
- Mitigation Strategy 5-Year Mitigation Plan Review for Countywide Actions
- Review of Municipality-Specific Mitigation Actions

Next Steps

The following next steps were identified at the close of the meeting:

- Tetra Tech will conduct a Planning Team Kickoff Webinar for Other Stakeholders later today.
- Municipalities will send any relevant documents, reports, plans, etc. to the County or Mr. Subbio for review and incorporation into the HMP.
- Municipalities will complete the information-gathering worksheets.
- Tetra Tech will continue to update the hazard profiles.

The webinar concluded at 11:15 a.m.



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**Chester County
Hazard Mitigation Plan (HMP)
Update
Planning Team Municipal
Kickoff Meeting**

1

Agenda

- Attendance
- Quick Intro to Hazard Mitigation
- Planning Process
- Review Schedule
- Introduce Worksheets
- Next Steps
- Questions

2

Attendance

- Please post your name and organization in the Chat.

3

Quick Intro to Hazard Mitigation

National Preparedness System: Mission Areas

Prevention

Protection

Mitigation

Response

Recovery

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from disasters.

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Quick Intro to Hazard Mitigation (Cont.)

Local Plans and Regulations

- Updating building codes
- Integrating risk into Master Plans

Education and Awareness Programs

- Flood insurance information
- Know your risk! campaign

Natural Systems Protection

- Preserving natural floodplain functions
- Protecting well recharge areas

Structure and Infrastructure Projects

- Constructing a levee
- Elevating a house above the base flood level

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Quick Intro to Hazard Mitigation (Cont.)

- Disaster Mitigation Act of 2000
 - Risk assessment
 - Public outreach and participation
 - Process for update
 - Formal State and FEMA review
 - Documentation of acceptance by the community
- Hazard Mitigation Assistance

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Quick Intro to Hazard Mitigation (Cont.)

Per FEMA's 2017 National Institute of Building Sciences report, mitigation saves \$\$\$!

	National Benefit-Cost Ratio Per Peril <small>*BCR numbers in this study have been rounded</small>	Federally Funded
Overall Hazard Benefit-Cost Ratio		6:1
Riverine Flood		7:1
Hurricane Surge		Too few grants
Wind		5:1
Earthquake		3:1
Wildland-Urban Interface Fire		3:1



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Quick Intro to Hazard Mitigation (Cont.)

Questions?



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Planning Process

- Update the Risk Assessment
- Update the Capabilities Assessment
- Update the Mitigation Strategy
- Update Other Sections of the HMP
- Submit the HMP for Review
- Adopt the HMP
- Implement the HMP



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Update the Risk Assessment

▪ Hazards of Concern

- | | | |
|---|----------------------|----------------------------|
| • Dam Failure | • Invasive Species | • Terrorism |
| • Drought and Water Supply Deficiencies | • Nuclear Incidents | • Tornadoes and Windstorms |
| • Earthquake | • Opioid Epidemic | • Transportation Accidents |
| • Environmental Hazards | • Pandemic | • Utility Failure |
| • Extreme Temperatures | • Pipeline Incidents | • Winter Storms |
| • Floods, Flash Floods, and Ice Jams | • Radon Exposure | |
| • Hurricane and Tropical Storms | • Structural Fires | |

- Risk Assessment Review Meeting



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Update the Capabilities Assessment

- Capabilities
 - Planning and Regulatory Capability
 - Administrative and Technical Capability
 - Financial Capability
 - Education and Outreach
 - Self-Assessment of Capability



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Update the Mitigation Strategy

- Review Goals and Objectives
- Determine Status of Mitigation Actions
- Identify New Mitigation Actions/Projects
 - *Focus on specific, implementable actions!*
- Conduct Mitigation Strategy Workshop



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Update Other Sections of the HMP

- County Profile
 - Updated data
- Planning Process
 - Documentation of the update process
- Plan Maintenance
 - Incorporation into other plans as well as determining ways to incorporate other plans into the updated HMP



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Submit the HMP for Review

- Review Draft with Planning Team
- 30-day Public Comment Period
- Conduct Public Meeting to Review the Draft
- Submit for Pennsylvania Emergency Management Agency (PEMA) Review
 - 14 to 28 days
- Submit for Federal Emergency Management Agency (FEMA) Review
 - 45 days
- “Approvable Pending Adoption” Status



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Adopt the HMP

- County and at least one participating municipality
- FEMA Approval
- Adoption Deadline – December 2020



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Implement the HMP

- Regular Planning Team Meetings
- Stakeholder Meetings
- Implement Mitigation Actions and Projects
 - Integrate actions where appropriate



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Review Schedule

- Risk Assessment
 - February – May 2020
- Capabilities Assessment
 - February – June 2020
- Mitigation Strategy
 - February – June 2020
- Draft Plan by the end of June 2020
- Submit to PEMA by the end of July 2020
- Submit to FEMA by the middle of August 2020
- “Approvable Pending Adoption” by late October 2020



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Introduce Worksheets

- Hazard Identification and Risk Evaluation Worksheet
- Capability Assessment Survey
- National Flood Insurance Program (NFIP) Survey
- Mitigation Strategy 5-Year Mitigation Plan Review



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Next Steps

- Document Request
- Complete Municipal Worksheets
- Update the Risk Assessment



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Questions?

Thank you for your time!



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Contacts



Gabby Ratliff
gratliff@chesco.org
(610) 344-5042



Tony Subbio
tony.subbio@tetrattech.com
(717) 839-5654



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AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Planning Team Municipal Kickoff Meeting

Friday, March 13, 2020 | 10:00 a.m. – 12:00 p.m.

1. Attendance

2. Quick Intro to Hazard Mitigation

3. Planning Process
 - a. Update the Risk Assessment
 - b. Update the Capabilities Assessment
 - c. Update the Mitigation Strategy
 - d. Update Other Sections of the HMP
 - e. Submit the HMP for Review
 - f. Adopt the HMP
 - g. Implement the HMP

4. Review Schedule

5. Introduce Worksheets

6. Next Steps
 - a. Document Request
 - b. Complete Municipal Worksheets
 - c. Update the Risk Assessment

7. Questions



Hazard Identification and Risk Evaluation Worksheet

Name: _____ Title: _____

Jurisdiction: _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought		
Earthquake		
Extreme Temperatures		
Flood, Flash Flood, and Ice Jam		
Hurricane and Tropical Storm		
Radon Exposure		
Thunderstorm		
Tornado and Windstorm		
Winter Storm		
Human-made Hazards		
Armed Attacks		
Civil Disturbance		
Conventional/Improvised Bombs		
Cyber Terrorism		
Dam Breaches		



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions		
Fires		
Hazard Material Releases		
Nuclear Incidents		
Transportation Accidents		

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _____

Point of Contact Name and Title: _____

Phone: _____

E-mail: _____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations					



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance					
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code					
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)				
Planners or engineers (with natural and/or human caused hazards knowledge)				
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)				
Emergency Manager				
NFIP Floodplain Administrator				
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis				
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming				
Community Development Block Grants (CDBG)				
Special Purpose Taxes				
Gas / Electric Utility Fees				
Water / Sewer Fees				
Stormwater Utility Fees				
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)				
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.				
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			
Administrative and Technical Capability			
Financial Capability			
Education and Outreach			

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: _____

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.		
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.		
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.		
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.		
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.		



2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.		

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.		
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.		
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.		



Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County						
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction						
AH-4. Provide regular updates to the countywide Mass Care Plan						
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities						
AH-8. Arrange and hold hazard mitigation workshops for county residents						
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division						
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters						
AH-11. Enhance the communications equipment between the County and the municipalities						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures						
AH-18. Promote awareness of mental health services and resources throughout all the facilities within the County to include schools, workplaces, and healthcare facilities						
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events						
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads						
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances						
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities						
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-12. Continue to maintain the stream gauges						
F-13. Continue to maintain the stream gauges within the County						
F-14. Install stream gauges if an additional area is identified to benefit from one						
F-15. Provide education to the municipalities on flood gauges						
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas						
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris						
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management						
TOR-4. Retrofit critical public facilities with safe rooms						
D-1. Provide public information on the effects of droughts on public and private wells						
D-2. Promote sustainability programs and green practices throughout the County						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						
PG-1. Encourage security check of bags/coolers at public gathering						
PG-2. Plan for and implement strengthened security at public events						
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events						
PG-7. Utilize temporary mobile camera during large events to monitor safety and security						
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events						
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure						
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage						
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)						
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						
TRF-7. Provide public education on traffic accident reduction						
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County						
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations						
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



MEETING NOTES

Meeting	Chester County Hazard Mitigation Plan (HMP) Planning Team Kickoff Meeting for Stakeholders		
Date	March 13, 2020	Time	1:00 – 1:40 p.m.
Location	Webinar		
Attendees	Debra Allen, Director, Brandywine River Valley Home Health		
	Jason Auge, Director, Hickory House		
	Jason Barrett, AFC Urgent Care, West Chester		
	Mike Beaty, Superintendent, Tredyffrin Township Police Department		
	Carrie Conwell, Senior Environmental Planner, Chester County Planning Commission		
	Brad M Cosgrove, ALS Captain, West End Fire Company		
	Cynthia Dallara, Administrator, Tel Hai Personal Care		
	Julie Donley, Director of Nursing, Children's Behavioral Health Services, Devereux		
	Matthew Eick, EMS Captain, Longwood Fire Company		
	Grant Everhart, Deputy Chief, Goshen Fire Company		
	Joseph Harris		
	Susan Hipp-Ludwick, AFC Urgent Care, West Chester		
	Peter Hughes, President, Trout Unlimited Valley Forge		
	Kate Jenkins, Home Health Director, Brookdale		
	Steven Johnson		
	Karen Katherman, Nursing Supervisor, Pocopson Home		
	Liz Linn		
	Craig Marleton, Aqua Water		
	Kathleen McCaig, Associate Planner, Brandywine Conservancy and Museum of Art		
	Stephanie Miller, Senior Director, United Way of Chester County		
	Stephen Nuse, EMS Captain, Avondale Fire Company		
	John Osborne		
	Chris Plumley, EMS Captain, Kennett Fire Company		
	Trevor Pye, President, There's No Place Like Home (TNPLH) Home Care		
	Rupert Rosetti, Octorara Watershed Association		
	Marjorie Thomas, Chief Operating Officer, Holisticare Hospice		
	Gary Weigel, EMS Chief, Goshen Fire Company		
Fred W. Wurster, EMS Chief, Minquas Fire Company			
Stacey Yosko, Director of Resident Services, Harrison Senior Living			



MEETING NOTES

Unidentified Representative, Brandywine Hospital - Tower Health
Unidentified Representative, Oxford Area School District
Unidentified Representative, Tredyffrin/Easttown School District
Stefanie Otley, Planner, Tetra Tech, Inc. (Tetra Tech)
Tony Subbio, Project Manager, Tetra Tech
Eight additional unidentified callers

Discussion Points

This section summarizes each discussion point addressed during the Planning Team Kickoff Meeting For Stakeholders. The meeting was held remotely because of the emerging COVID-19 pandemic. Because of the number of municipalities and additional stakeholders in Chester County, separate webinars were conducted for municipal officials and other stakeholders.

Quick Introduction to Hazard Mitigation

Mr. Subbio provided a brief overview of hazard mitigation for attendees. He defined hazard mitigation, and reviewed types of mitigation actions. He described the requirements of the Disaster Mitigation Act of 2000 (DMA 2000) for HMPs, as well as Pennsylvania's requirements. He discussed the Federal Emergency Management Agency's (FEMA) mitigation grants. Finally, he reviewed statistics regarding the benefits of mitigation versus their costs.

Planning Process

Mr. Subbio provided an overview of the HMP planning process, then described the steps in detail. This section summarizes the detailed description of each step.

The first step involves identifying the hazards of concern for Chester County. The hazards of concern that will be analyzed in the HMP are as follows:

- Dam Failure
- Drought and Water Supply Deficiencies
- Earthquake
- Environmental Hazards
- Extreme Temperatures
- Floods, Flash Floods, and Ice Jams
- Hurricane and Tropical Storms
- Invasive Species
- Nuclear Incidents
- Opioid Epidemic
- Pandemic
- Pipeline Incidents
- Radon Exposure
- Structural Fires
- Terrorism
- Tornadoes and Windstorms
- Transportation Accidents
- Utility Failure
- Winter Storms

Mr. Subbio asked attendees to identify any problems these hazards have caused their organizations; attendees did not respond with comments.



MEETING NOTES

Tetra Tech and the county will assess municipalities' and stakeholders' capabilities to implement hazard mitigation. These capabilities include plans, regulations, staff expertise, access to internal and external funding, training of key staff, and education and outreach. Mr. Subbio asked attendees to discuss the plans they have in place, funding available, and staff expertise to implement hazard mitigation.

Next Steps

The following next steps were identified at the close of the meeting:

- Stakeholders will identify problems and problem areas caused by hazards in the county.
- Stakeholders will identify critical facilities that require backup power generators.
- Stakeholders will work with their host municipalities to provide information for the HMP update.

The webinar concluded at 1:40 p.m.



AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Planning Team Stakeholder Kickoff Meeting

Friday, March 13, 2020 | 1:00 – 3:00 p.m.

-
1. Attendance

 2. Quick Intro to Hazard Mitigation

 3. Planning Process

 4. Hazards of Concern

 5. Capabilities

 6. Solutions

 7. Next Steps
 - a. Identify problems and problem areas
 - b. Identify backup power generation needs at critical facilities
 - c. Work with your municipality(ies)

 8. Questions





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Chester County Hazard Mitigation Plan (HMP)

Update Planning Team Stakeholder Kickoff Meeting

1

Agenda

- Attendance
- Quick Intro to Hazard Mitigation
- Planning Process
- Hazards of Concern
- Capabilities
- Solutions
- Next Steps
- Questions

2

Attendance

- Please post your name and organization in the Chat.

3

Quick Intro to Hazard Mitigation

National Preparedness System: Mission Areas

Prevention

Protection

Mitigation

Response

Recovery

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from disasters.

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Quick Intro to Hazard Mitigation (Cont.)

Local Plans and Regulations

- Updating building codes
- Integrating risk into Master Plans

Education and Awareness Programs

- Flood insurance information
- Know your risk! campaign

Natural Systems Protection

- Preserving natural floodplain functions
- Protecting well recharge areas

Structure and Infrastructure Projects

- Constructing a levee
- Elevating a house above the base flood level

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Quick Intro to Hazard Mitigation (Cont.)

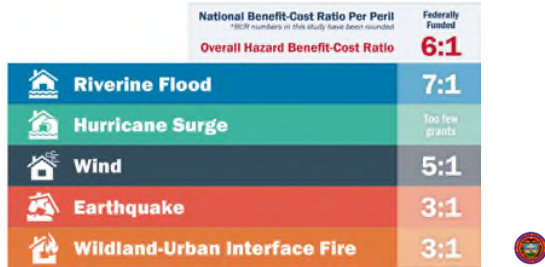
- Disaster Mitigation Act of 2000
 - Risk assessment
 - Public outreach and participation
 - Process for update
 - Formal State and FEMA review
 - Documentation of acceptance by the community
- Hazard Mitigation Assistance

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Quick Intro to Hazard Mitigation (Cont.)

Per FEMA's 2017 National Institute of Building Sciences report, mitigation saves \$\$\$!



7

Quick Intro to Hazard Mitigation (Cont.)

Questions?

8

Planning Process

- Update the Risk Assessment
- Update the Capabilities Assessment
- Update the Mitigation Strategy
- Develop the HMP
- Submit the HMP for Review
- Adopt the HMP
- Implement the HMP

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Hazards of Concern

- *How have these hazards affected your facility/organization?*
- *What problems do these hazards cause in your community(ies)?*
- *Which of these hazards do you worry about for your organization?*

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Hazards of Concern

- | | | |
|---|----------------------|----------------------------|
| • Dam Failure | • Invasive Species | • Terrorism |
| • Drought and Water Supply Deficiencies | • Nuclear Incidents | • Tornadoes and Windstorms |
| • Earthquake | • Opioid Epidemic | • Transportation Accidents |
| • Environmental Hazards | • Pandemic | • Utility Failure |
| • Extreme Temperatures | • Pipeline Incidents | • Winter Storms |
| • Floods, Flash Floods, and Ice Jams | • Radon Exposure | |
| • Hurricane and Tropical Storms | • Structural Fires | |

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Capabilities

- What plans/procedures do you have in place to respond to or reduce vulnerability from those hazards?
- What funding do you leverage to reduce your vulnerability?
- What staff expertise do you have?
 - Emergency response
 - Planners
 - Grant writers
 - Engineering

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Solutions

- *"I/My neighbors near _____ keep talking about moving because I'm/they're tired of dealing with _____!"*
- *"It would be great if the county/township/borough/state fixed _____!"*
- What critical facilities need backup power generators?



13

Next Steps

- Identify problems and problem areas
- Identify backup power generation needs at critical facilities
- Work with your municipality(ies)
- *Please provide information by March 27, 2020.*



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Questions?

Thank you for your time!



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Contacts



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MEETING NOTES

Meeting	Chester County Risk Assessment Review Meeting		
Date	November 9, 2020	Time	10:00 a.m. – 12:00 p.m.
Location	Microsoft Teams Webinar		
Attendees	Mike Groover, Acting Deputing Director for Emergency Management, Chester County Department of Emergency Services (DES)		
	Mike Murphy, Director, Chester County Director of Emergency Services		
	Beau Crowing, Director of Operations, Chester County DES		
	Tyree Lewis, Chester County		
	Patty Mains, DES Staff		
	Gabby Ratliff, Emergency Planning Coordinator, Chester County DES		
	Tammy Whiteman, DES staff		
	Cameron Zettlemoyer, Chester County DES		
	Dawn White, Chester County Department of Community Development		
	Robyn Slater, Public Health Planner, Chester County Health Department		
	Craig Thomas, Chester County Water Resources Authority		
	Cory Trego, Chester County Water Resources Authority		
	Caren Andrews, Manager, Atglen Borough		
	Milt Rudy, Supervisor, Elk Township, Deputy Treasurer for Oxford Regional Emergency Management		
	Gretchen Flack, Executive Assistant to the Township Manager, Kennett Township		
	Roger Lysle, Public Works Director, Kennett Township		
	John Morris, EMC Kennett Square Borough		
	Carolyn Matalon, Secretary, London Britain Township		
	Ramsey Reiner, Manager, New Garden Township		
	Bob Ketcham, Council, Oxford Borough		
	Wendell Fenton, Supervisor, Pennsbury Township		
	Kathleen Howley, Manager, Pennsbury Township		
	E.J. Mentry, Manager, Schuylkill Township		
	Judy Lizza, Township Manager, Thornbury Township		
	Tony Scheivert, Manager, Upper Uwclan Township		
	Andrea Testa, EMC/Fire Marshal, West Goshen Township		
	Shaun Walsh, Supervisor, West Goshen Township		
	Deborah Kolpak, Supervisor, West Nantmeal Township		
Tiffany Bell, Elected Official, West Nottingham Township			
Candace Miller, Supervisor, West Nottingham Township			



MEETING NOTES

George Turner, Emergency Management Center (EMC) West Whiteland Township
Marty McKenzie, EMC, Willistown Township
Raymond Stackhouse, Fire Chief, Caln Township/Parkesburg Borough/West Sadsbury Township
Tim Hubbard, Charlestown Township and Downingtown School District
Ron Miller, Chester County Fire Police Association
John Felicetti, Chester County Hospital
Howard Holland, Chief, Downingtown Police Department
John Reynolds, Jr., EMC East Nottingham Township, Oxford Borough, and West Nottingham Township
Matt Williams Chief of Police, East Vincent Township
Majorie Thomas, Chief Operating Officer, Holisticare Hospice
Richard Franks, Career Supervisor, Kennett Fire Company
Chris Plumley, Kennett Fire Co./Chester County Department of Emergency Services
Robert Weer, Fire Marshal, London Grove Township
Greg Papiernik, Director of Public Safety – Longwood Gardens
Susan Eccles, Park Lane at Bellingham Skilled Nursing Facility
Dave Mellinger, Park Lane at Bellingham Skilled Nursing Facility
Jenn Messa, Quality Enrichment Director, Parzival
Heather D'Andrea, Pocopson Home
Jackie McKenna, Administrator, Pocopson Home
Jim Fetterman, Chief of Police, Schuylkill Township
Amanda Lafty, Community Development Technician, Tredyffrin Township
Shane Kinsey, Union Fire Company No. 1/London Grove Township/CCDES
Russell Benjamin, Pennsylvania Department of Environmental Protection
Scott Pilotti, Vanguard
Todd Sowinski
Stefanie Chumley, Tetra Tech Inc. (Tetra Tech)
Tony Subbio, Tetra Tech

Discussion Points

This section summarizes each discussion point addressed during the Risk Assessment Review Meeting.

Welcome

Ms. Ratliff welcomed attendees to the meeting. Attendees introduced themselves.



MEETING NOTES

Worksheet Completion Status

Mr. Subbio stated that worksheets were still needed from 43 municipalities. At least one worksheet was received from 31 municipalities, and all four worksheets have been received from 16 municipalities.

Risk Assessment Results

Hazard Profiles

Mr. Subbio reviewed the results of the risk assessment with attendees. Discussion points associated with each hazard are listed below.

- **Dam Failure** – Mr. Subbio reviewed the dam failure hazard. All-high hazard dams need an emergency action plan. Attendees did not report concerns regarding any county dams, or did they name any dams that were failing or nearly failing.
- **Drought and Water Supply Deficiencies** – Mr. Trego explained that the county has a comprehensive integrative water resources plan and the first draft was completed in 2002. The county is in the process of updating the plan now. One of the original processes included the 1 in 21-year baseflow, which refers to the low-flow rate of water in 21 years going into the local streams and comparing that number to each of the county's sub-basins. Comparing the low-flow rate to the water that is being withdrawn through public water supply, industrial water usage, agricultural, or drinking water wells compared to the amount of water being replenished/recharged from precipitation, WWTPs, and septic tanks. The county is planning on updating the analysis for the next plan, which will show the ways in which the county is susceptible to drought.

Mr. Thomas added that the county should probably review some of the smaller private/municipal water suppliers (i.e., mobile home parks) and that they have opportunities to develop resiliency/mitigation actions to prepare for drought. Larger water suppliers can purchase and transfer water, but they need to look at for the smaller suppliers. Some of the smaller suppliers have plans in place to work with larger suppliers to help serve their population.

- **Earthquake** – Mr. Subbio explained that three earthquakes have occurred since 1973 with epicenters in the county. The attendees have not seen any impacts or building damage from earthquakes in the county.
- **Environmental Hazards (Hazardous Materials Releases)** – Ms. Byun asked if Tetra Tech looked at spills that could potentially enter waterways. Mr. Subbio explained environmental impacts are examined, as well as maps that show vulnerable areas. The analysis is used to examine the waterways that are exposed. A component of off-site emergency response plans for facilities that have extremely hazardous substances, is identifying waterways that are in the vulnerable area.

Ms. Miller noted that the intersection of Route 272 and Cemetery/Union Square Roads in West Nottingham has experienced many accidents, and could be potentially dangerous should trucks carrying hazardous materials be involved in an accident in this area.

- **Extreme Temperatures** – Ms. Lafty said Tredyffrin Township opened cooling centers once or twice last year but not many people visited them. Ms. Ratliff added that DES talked with the Department of



MEETING NOTES

Community Development about comfort centers when they open in the past. Even though the county does not run them, DES is generally aware when the centers open. When the county experiences extreme temperatures and weather, DES reaches out to municipality emergency management centers (EMC) to discuss and set up centers.

- **Flood, Flash Flood, and Ice Jams** – Mr. Trego said the Chester County Water Resources Authority receives calls about an area in Willistown Township along White Horse Road where it crosses Crum Creek. Issue appears to be that water backs up under bridge, into the yard of a resident, and flows around the bridge. The resident's driveway and garage were inundated more than once and a vehicle was lost.

Ms. Andrews explained that a creek often overflows in Atglen Borough. The creek runs under the Main Street Bridge and crosses Fallowfield Road, which floods and prevents people from accessing their homes (streets that were blocked off include Brook, Cattail, and Willow Streets). There is also an underpass that floods on Green Street.

Mr. Miller explained that on Business and Route 30 in Thorndale, the railroad underpass floods four to five times during the year. Locations include Bailey Road near the train station and Wawa, and North and South Calen Road.

Mr. Lysle stated that Kennett Township has five to six Pennsylvania Department of Transportation (PennDOT) and township roads following the stream (north south) that seem to flood and close during heavy rain events, as well as considerable shoulder damage.

Mr. Trego stated that along the West Branch of the Brandywine in Honey Brook Township the intersection of Birdell and Beaver Dam Roads often floods and closes during heavy rain events. Flooding also occurs in Warwick Township on County Park Road off Route 23, near Warwick Park. Mt. Pleasant Road also becomes inundated in Warwick Township during heavy rain events.

Mr. Walsh explained West Goshen Township is experiencing accelerated damaged to stormwater piping that is constructed of corrugated metal pipe (CMP). The intensity of stormwater flow is eroding and damaging the aging and thinning CMP, causing buckling or complete failure resulting in sinkholes. The township will need a comprehensive program to inspect, rehabilitate, and replace older CMP stormwater piping in the older neighborhoods.

Ms. Ratliff reported flooding in Treddyfrin Township and Downingtown.

Ms. Lafty has done some mapping of Treddyfrin Township and can send it over.

Mr. Holland stated that Downingtown is experiencing worsening flooding issues, including vehicles damaged and roads flooding and closed. The newer land development is exacerbating the flooding issue, causing retention basins to overflow. During large rain events, the stormwater infrastructure is overwhelmed and roads flood. After the rain, the water flows into the waterways and floods other roads.

- **Hurricane and Tropical Storm** – The county does not experience storm surge; however, because of it's proximity to the coast, the county wanted to include the hurricane and tropical storm hazard because of the storms that do come through.



MEETING NOTES

- **Invasive Species** – The main species of concern within the county is the spotted lanternfly. Mr. Ratliff has been contacted the Planning Commission and Penn State Cooperative Extension regarding crop loss data; however, the data are preliminary.
- **Nuclear Incident** – The nuclear incident hazard includes radiological releases at power plants. Mr. Subbio described the plume exposure pathway and ingestion exposure pathway emergency planning zones.
- **Opioid Addiction Response** – The number of deaths in 2020 caused by drug overdose has recently gone up to over 66 people. All total overdose deaths are considered, not just opioids.
- **Pandemic** – Ms. Slater from Health Department explained that the numbers of infected persons as well as deaths have increased. The pandemic hazard has had a significant impact on human services and social services, schooling, and mental health. Hopefully these impacts will be studied soon.
- **Environmental Hazards, Gas, and Liquid Pipelines** – Exposure to this hazard depends on the material released, the manner of release, and other environmental factors.
- **Radon Exposure** – Radon presents high-exposure potential in Chester County. Radon is a significant hazard that can cause long-term health effects to county residents.
- **Structural Fire** – Mr. Holland talked about the number of volunteer fire fighters, and expressed the challenge of maintaining and retaining personnel.
- **Terrorism** – Ways to prevent terrorism include distancing facilities from the street, and incorporating concrete barriers or planters. The attendees did not express any types of attacks or buildings they were concerned about.
- **Tornado, Windstorm** – The entire county is vulnerable to this hazard. Damage could be countywide and affect multiple municipalities. Attendees did not express concerns about this hazard.
- **Transportation Accidents** – Mr. Rudy asked if any review has been done on Amish vehicles. Ms. Ratliff will research if any information is available.
- **Utility Interruption** – Ms. Ratliff has talked with EMCs about Frontier and communication failures in the southern portion of the county.
- **Winter Storms** – Snow, blizzards, and ice storms can affect the entire county; historically, the county has experienced significant impacts from this hazard. The participants did not express concerns about winter storms.

Risk Factor Analysis

Mr. Subbio reviewed the Risk Factor Analysis, which prioritizes the hazards that could affect the county and its municipalities. He also reviewed the Municipal Risk Factor Analysis worksheet. Municipal officials can indicate on the worksheet their risk relative to the county's overall risk from each of the profiled hazards.

Next Steps

- Hazard profiles will be updated based on discussions at this meeting.



MEETING NOTES

- Tetra Tech will develop a set of draft mitigation goals and objectives and discuss them with the Steering Committee.
- A Mitigation Strategy Workshop will be conducted on December 9, 2020. Invitations will be drafted and sent to the Planning Team.
- Tetra Tech will begin developing mitigation actions for inclusion in the updated HMP.



MEETING NOTES

Meeting	Chester County Risk Assessment Review Meeting		
Date	November 9, 2020	Time	6:00 p.m. – 8:00 p.m.
Location	Microsoft Teams Webinar		
Attendees	Beau Crowding, Director of Operations, Chester County Department of Emergency Services (DES)		
	Michael Groover, Acting Deputy Director for Emergency Management, Chester County Emergency Services		
	Gabby Ratliff, Chester County DES		
	Jennifer Brion, Department of Human Services		
	Rob Schorr, Emergency Management Coordinator (EMC), Easttown Township		
	Dr. Ellen Turk, School Safety and Security Coordinator, Easttown Township, Tredyffrin Township		
	Jonathan Brackbill, EMC, East Coventry Township		
	Loren Nafziger, EMC, East Whiteland Township		
	Jeff Hammaker, EMC Kennett Township		
	David Flad, Emergency Director, New London Township		
	Mike Hochhaus, EMC, Pennsbury Township		
	Moujan Toloubadei, EMC, Schuylkill Township		
	Joe Dell’Arciprete, Emergency Management Coordinator, West Brandywine Township		
	John Hellmann, Supervisor, West Goshen Township		
	Chris Chalmers, Director of Maintenance Camilla Hall Nursing Home		
	Zach Fifer, Willistown Township Police		
	Renee Steube, Resident		
	Zach Nelson, Construction Coordinator, Chester County Department of Community Development		
Stefanie Chumley, Tetra Tech, Inc. (Tetra Tech)			
Tony Subbio, Tetra Tech			

Discussion Points

This section summarizes each discussion point addressed during the Risk Assessment Review Meeting.

Welcome

Ms. Ratliff welcomed attendees to the meeting. Attendees introduced themselves.

Worksheet Completion Status

Mr. Subbio stated that worksheets were still needed from 43 municipalities. At least one worksheet was received from 31 municipalities, and all four worksheets have been received from 16 municipalities.



MEETING NOTES

Risk Assessment Results

Hazard Profiles

Mr. Subbio reviewed the results of the risk assessment with attendees. Discussion points associated with each hazard are listed below.

- **Dam Failure** – Mr. Subbio reviewed the dam failure hazard. All high-hazard dams need an emergency action plan. Attendees did not report concerns regarding any county dams, or did they name any dams that were failing or nearly failing.
- **Drought and Water Supply Deficiencies** – Mr. Subbio explained that the main concern with drought and exposure is crop losses and crop loss insurance payments. The attendees did not have any questions or comments about drought and water supply deficiencies.
- **Earthquake** – Mr. Dell'Arciprete remembered an earthquake in 1976 or 1977. Loren Nafziger slightly felt one in the southern part of the county a year or two ago, but Loren did not recall where the epicenter was.
- **Environmental Hazards (Hazardous Materials Releases)** – Mr. Dell'Arciprete asked if the fuel storage facility on Route 322 in West Brandywine Township was included in the analysis. Ms. Ratliff explained that the facility is occupied by Sunoco Logistics and it is incorporated in the analysis.
- **Extreme Temperatures** – Mr. Subbio discussed heating and cooling centers with the attendees. Mr. Dell'Arciprete said that before 2013, West Brandywine Township opened a comfort (cooling) facility. The Brandywine Township building is available to be used; however, Pope John Paul II Regional Catholic Elementary School could also be used if a larger facility is needed.
- **Flood, Flash Flood, and Ice Jams** – Mr. Hammaker explained that Kennett Township experienced a hurricane over the summer that was followed by a high-water event a few days later. Streets were underwater and drainage throughout the township was overwhelmed, especially the east and west branches of the creek. Stormwater management regulations currently in place do not address the bigger events and issues related to system overwhelm. Mr. Subbio suggested that a possible mitigation action could be to enhance regulations to plan for more significant events and infrastructure built to withstand the 50, 100, or 500-year rain events.

Mr. Hellmann said a culvert near Goose Creek under Montgomery Avenue by Henderson High School in West Goshen Township floods even during an average thunderstorm. The culvert gets clogged with debris causing roads to close due to flooding. Mr. Subbio suggested that a possible mitigation action could be to upgrade and upsize the culvert to withstand the heavy rain events and mitigate road flooding and closures.

Mr. Toloubadei from Schuylkill Township explained his neighborhood has an open culvert that comes in the back of the neighborhood. During severe storms, severe flooding occurs. Two to three houses have encountered damage from flooding. Flooding occurs on Route 23 as well. The township pulled blueprints of the neighborhood and officials say nothing can be done. The problem is worsening and needs to be mitigated because it is not just affecting homeowners but the road as well.

Mr. Hellmann stated sinkholes in people's backyards in West Goshen Township are resulting from deteriorating infrastructure and asked if projects to mitigate them would be eligible for funding. Mr. Subbio explained repairing the infrastructure could be included as a mitigation action in the plan if the piping is too small and is rusted and deteriorating.

- **Hurricane and Tropical Storm** – Mr. Chalmers from Camilla Hall Nursing Home is concerned with power outages from windstorms. When old trees and branches along Hershey Mill Road come down,



MEETING NOTES

power outages at Camilla Hall occur. Funding is available to deal with power outages. A mitigation action could be developed to work better with power companies for a tree trimming program and inspection of powerlines, or the nursing home could apply for funding for a generator. Likewise, another action could include developing an education and awareness program to educate private property owners on the issued and to encourage them to trim trees when needed.

Mr. Brackbill from East Coventry Township asked how the storm from August 2020 would affect historical storm data, as the township was on the worse side of the storm. Ms. Ratliff explained the county experienced road closures, washed out roads, and minor damages, but no property damages. The county did not experience major damage or destroyed buildings.

Mr. Groover said Chester County DES did not get a lot of reporting from municipalities from flooding, but all usual places flooded. The county is trying to encourage reporting, even if only the reoccurring places are experiencing flooding. Current data are critical to support grant application.

- **Invasive Species** – Spotted lanternfly is the main invasive species concern within Chester County. Ms. Ratliff said that one community reported the issue with spotted lanternfly infestation is not so much crop damage, but the nuisance it causes. The community launched a campaign to educate the public on the spotted lanternfly.
- **Nuclear Incident** – Mr. Tolobadei said he knows Schuylkill Township is potentially exposed to the nuclear incident hazard. EMC participates in every exercise with all volunteers and county officials. They pass every exercise and make sure they are prepared. Limerick does a good job at keeping their facility and regulations up to date.

Mr. Hellmann asked what expenses can be covered by FEMA. Mr. Subbio explained they will not cover nuclear incidents but by identifying vulnerable populations and CFs, a future funding stream might become available through NRC.

- **Opioid Addiction Response** – The number of deaths in 2020 caused by drug overdose has recently gone up to over 66 people. All total overdose deaths are considered, not just opioids.
- **Pandemic** – Mr. Hellmann asked about which pandemic-related issues could qualify for FEMA reimbursement. Ms. Ratliff explained that PEMA sent survey asking about the costs municipalities have occurred related to the 2019 Coronavirus pandemic (e.g., personal protective equipment [PPE]). They may still be gathering information. Ms. Ratliff did not think FEMA would be providing reimbursement, but PEMA would. Telecommunications infrastructure was impacted because of the increase of residents schooling and working from home. A funding stream could be developed to enhance broadband Internet services; therefore, including this as a mitigation action could help gain funding in the future to reduce vulnerability and the affects of this type of hazard, even if it is not a natural hazard.
- **Environmental Hazards, Gas, and Liquid Pipelines** – Mr. Hellmann from West Goshen Township explained when an incident occurred in his community, the police responded. He also raised the question: are the police equipped to identify and respond? Fortunately, this particular incident did not significant effect the community. Ms. Ratliff said DES knows the importance of pipeline safety and building out capabilities. Mr. Groover said additional training is being created especially for emergency medical services personnel within areas of concern.
- **Radon Exposure** – Chester County's average exposure to radon is 6 pico Curies by liter (pCi/L), which is above EPA's action level. Educating people on radon exposure and ways they can reduce risk (such as installing radon fans) will help reduce vulnerability.



MEETING NOTES

- **Structural Fire** – Mr. Hammaker of Kennett Township said new construction in the township is more dangerous than older. Houses go up faster, beams are made of wood rather than steel, and wood burns. This presents a hazard for houses, firefighters, and the people living there. The county needs to get additional fire hydrants or underground water storage to maintain a safe level to be able to put out fires quicker.
- **Terrorism** – The attendees did not note of any targets of concern.
- **Tornado, Windstorm** – All structures and people are vulnerable to tornadoes and windstorms.
- **Transportation Accidents** – The county experiences many transportation accidents. Any physical damage would include the vehicle itself, but the effect on road closures and backup can be significant as well.
- **Utility Interruption** – The utility interruption hazard includes power outages, phone lines down, radio towers down, and water and wastewater problems. It is usually a secondary hazard to a storm. Encouraging people and critical facilities to have access to backup power can reduce vulnerability.
- **Winter Storms** – The entire county is vulnerable to the winter storm hazard, which has the potential to affect the whole county at one time. Effects of winter storms include significant property damage such as roofs caving in, and personal injuries. The hazard can also lead to utility failure, flooding, and transportation accidents.

Risk Factor Analysis

Mr. Subbio reviewed the Risk Factor Analysis, which prioritizes the hazards that could affect the county and its municipalities. He also reviewed the Municipal Risk Factor Analysis worksheet. Municipal officials can indicate on the worksheet their risk relative to the county's overall risk from each of the profiled hazards.

Next Steps

- Hazard profiles will be updated based on discussions at this meeting.
- Tetra Tech will develop a set of draft mitigation goals and objectives and discuss them with the Steering Committee.
- A Mitigation Strategy Workshop will be conducted on December 9, 2020. Invitations will be drafted and sent to the Planning Team.
- Tetra Tech will begin developing mitigation actions for inclusion in the updated HMP.



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Chester County Hazard Mitigation Plan (HMP) Update Risk Assessment Review Meeting

1

Welcome

2

Agenda

- Welcome
- Worksheet Completion Status
- Risk Assessment Results
- Next Steps

3

Worksheet Completion Status

- Still need worksheets from 43 municipalities
 - Have received at least one worksheet from 31
 - Received all five worksheets from 16
 - Conversations with DES to fill the gap
- Providing information is a participation requirement for the HMP
 - Lack of participation in this HMP planning process can prevent funding eligibility

4

Risk Assessment Results

- Dam Failure
 - 22 dams; 17 high-hazard
 - Emergency Action Plans for high-hazard dams

5

Risk Assessment Results

- Drought & Water Supply Deficiencies
 - History (since 1980)
 - 22 drought watch declarations
 - 17 drought warning declarations
 - 15 drought emergency declarations
 - \$277,536 in lost crop insurance payments within the county from 2012-2019
 - Exposure
 - 168,367 acres of farmland
 - \$712 million per year in agricultural products
 - \$141 million in livestock, poultry, and associated products

6



Risk Assessment Results

- **Earthquake**
 - History
 - Three with epicenters in the county since 1973
 - Fracking may have caused earthquakes elsewhere
 - Exposure
 - 32.6% of the county population
 - 68.87% of the county
 - Losses from 500-year Mean Return Period (MRP) event
 - Over \$69.9 million in building damage
 - 142,451 tons of debris



7

7

Risk Assessment Results

- **Environmental Hazards (Hazardous Materials Releases)**
 - History
 - Since 2017, the county Hazmat Team provided on-scene response to 383 fuel spill incidents
 - Treddyfryn Township had the most cases, with 27 total incidents since 2017
 - Exposure
 - 146,307 people within 1/2 mile of railroad
 - 346,267 people within 1/2 mile of major roadway
 - 427,866 people within vulnerability radius of a hazmat facility
 - Expected damage depends on the incident

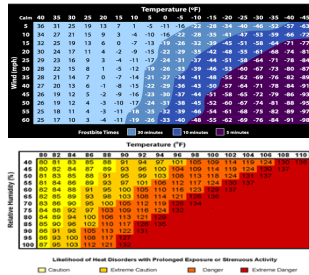


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Risk Assessment Results

- **Extreme Temperatures**
 - History (since 2015)
 - 6 extreme lows
 - 3 extreme highs
 - Impacts
 - Health effects
 - Drought
 - Utility load
 - Probability
 - 100% chance each year



9

9

Risk Assessment Results

- **Flood, Flash Flood, and Ice Jam (1% annual chance)**
 - History
 - Five federal disaster declarations since 1971
 - 136 major floods, flash floods, or ice jam events since 1971
 - Total flood insurance claims paid since 1978: \$22 million
 - Exposure
 - 5,191 people in the special flood hazard area (SFHA)
 - 7.3% of land area is in the SFHA
 - \$779,728,762 in exposed property value
 - 863 critical facilities

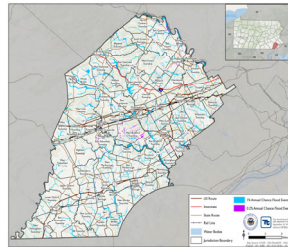


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Risk Assessment Results

- **Flood, Flash Flood, and Ice Jam (1% annual chance)**
 - Expected losses (1% annual chance flood)
 - \$2.4 billion in property damage (including residential, commercial, and other occupancy types)
 - 12,703 individuals displaced
 - 219 people seeking shelter



11

11

Risk Assessment Results

- **Hurricane and Tropical Storm**
 - History
 - 53 storms (remnants)
 - 8 federal disaster declarations
 - Expected Losses
 - 100-year MRP event (below 39 miles per hour [mph])
 - \$38 million in building and content losses
 - 500-year MRP event (54-65 mph)
 - \$285 million in building and content losses



12

12



Risk Assessment Results

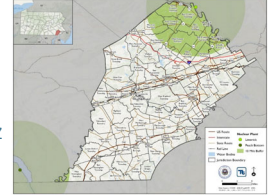
- **Invasive Species**
 - Main species of concern
 - Spotted lanternfly
 - Thousand cankers disease
 - Cankerworms
 - Emerald ash borer
 - Asian long-horned beetle
 - Can cause \$324 million worth of crop loss to farms in PA
 - Other species of concern
 - Chestnut blight
 - Hemlock woolly adelgid
 - Gypsy moth



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Risk Assessment Results

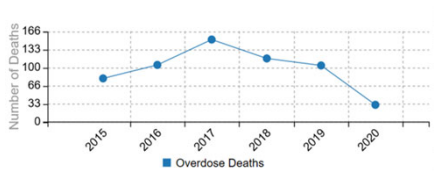
- **Nuclear Incident**
 - Plume Exposure Pathway EPZs
 - 10 miles from the plant
 - Peach Bottom Atomic Power Station, York County
 - 69 people
 - Limerick Generating Station, Montgomery County
 - 67,359 people
 - Ingestion Exposure Pathway EPZ
 - 50 miles from the plant
 - Entire county



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Risk Assessment Results

- **Opioid Addiction Response**
 - PA ranked 3rd in drug overdose deaths
 - Chester County
 - 2019 drug overdose death rate per 100,000 people was 19.8
 - Most deaths from fentanyl, heroin, and cocaine



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Risk Assessment Results

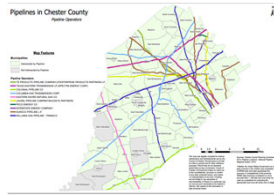
- **Pandemic**
 - COVID-19
 - 8,398 cases and 376 deaths as of November 4, 2020
 - Biggest pandemic threat to the county
 - No vaccine has been developed/proven for COVID-19
 - It is easily spreadable
 - Infected people can be asymptomatic
 - The virus is new and is not yet fully understood.
 - Influenza viruses with potential to reach pandemic levels:
 - Avian influenza A (H5N1), avian influenza (H7N9) and swine influenza (H1N1)



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Risk Assessment Results

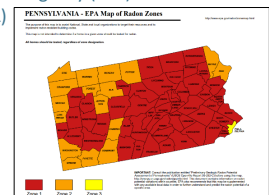
- **Environmental Hazards, Gas and Liquid Pipelines**
 - Exposure
 - 204,525 people within ½ mile of pipeline
 - 90,158 buildings within ½ mile of pipeline
 - \$76 billion in replacement cost value
 - History
 - West Whiteland and Uwchlan Townships, 2017
 - Cloudy water wells from installation of Mariner East 2
 - Darby Creek, 2018
 - 33,500 gallons of gas spilled
 - West Goshen Township, 2019
 - Explosion at Sunoco Pipeline Pump station



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Risk Assessment Results

- **Radon Exposure**
 - Health impacts
 - More than 20,000 lung cancer deaths every year
 - High exposure potential
 - U.S. Environmental Protection Agency (EPA) action level: 4 picoCuries per liter (pCi/L)
 - U.S. average: 1.3 pCi/L
 - County average: 6.0 pCi/L



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Risk Assessment Results

- **Structural Fire**
 - Any structure is vulnerable
 - Details on deaths, injuries, property damage not maintained
 - Reported structural fires:
 - 2017: 976
 - 2018: 1,013
 - 2019: 986
 - January - June 2020: 402



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Risk Assessment Results

- **Terrorism**
 - History
 - 68 terrorism incidents/suspicious activity events from 2014-2019
 - Types
 - Conventional/improvised bomb threats, cyber, and armed attacks
 - Exposure
 - All critical facilities are vulnerable



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Risk Assessment Results

- **Tornado, Windstorm**
 - History
 - 287 total number of funnel clouds, high wind, strong wind, thunderstorm wind, and tornadoes from 1953-2020
 - One disaster declaration
 - Annual probability: 100%
 - Damages
 - \$19,667 million in property damage
 - \$25,000 in crop damage
 - Exposure
 - Entire County is vulnerable

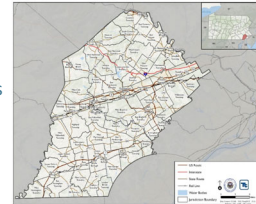


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Risk Assessment Results

- **Transportation Accidents**
 - History (2015 – 2019)
 - 24,257 major vehicle accidents
 - 33 railroad incidents
 - 4 aviation incidents
 - Potential economic impacts and other damage



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Risk Assessment Results

- **Utility Interruptions**
 - Often a secondary impact of another hazard event
 - History – 2002-2020
 - 75 total incidents
 - Exposure
 - Entire county
 - Regional events are usually the most severe
 - Impacts to vulnerable populations

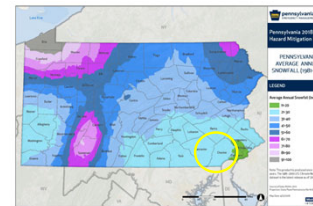


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Risk Assessment Results

- **Winter Storm**
 - History
 - 22 major winter storm events since 1993
 - 7 disaster declarations since 1993
 - Exposure
 - Entire County is vulnerable
 - \$194 billion in structural value



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Risk Assessment Results

Risk Factor Analysis

Hazard	Severity	Risk Assessment Category				Risk Factor (RF)
		Frequency	Exposure	Recovery Time	Consequence	
Water	Water Pollution	4	3	4	2	2.4
	Fluvial Erosion, Flood, and Ice Run	4	4	1	3	3.6
	Ground Pollution	4	4	1	4	3.2
	Drought	2	4	4	1	3.2
	Contaminants and Chemicals	3	3	4	4	1.2
	Environmental Effects	4	3	1	4	2.4
	Invasive Species	4	1	4	1	4.0
	Storms	4	3	1	4	3.2
	Extreme Temperature	4	1	4	1	3.2
	Water Shortage	3	2	4	1	3.2
	Public Facilities	4	2	1	4	2.4
	Public Health	3	1	4	1	4.0
Infrastructure	Infrastructure	4	1	2	4	3.2
	Public Exposure	3	1	3	1	4.0
	Earthquake	2	1	4	4	1.2
	Structural Plans	4	1	1	4	3.2
Land	Structural and Special Treaties	2	1	4	1	3.2
	Public Facilities	1	2	2	4	2.0
Land	Open Fields	1	1	1	3	2.0



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Risk Assessment Results

Municipal Risk Factor Analysis

Jurisdiction Risk - _____ (Municipality)

Hazard	County Risk	Municipality Risk
Water Pollution	2.4	2.4
Fluvial Erosion, Flood, and Ice Run	3.6	3.6
Ground Pollution	3.2	3.2
Drought	3.2	3.2
Contaminants and Chemicals	1.2	1.2
Environmental Effects	2.4	2.4
Invasive Species	4.0	4.0
Storms	3.2	3.2
Extreme Temperature	3.2	3.2
Water Shortage	3.2	3.2
Public Facilities	2.4	2.4
Public Health	4.0	4.0
Infrastructure	3.2	3.2
Public Exposure	4.0	4.0
Earthquake	1.2	1.2
Structural Plans	3.2	3.2
Structural and Special Treaties	3.2	3.2
Public Facilities	2.0	2.0
Open Fields	2.0	2.0

- > Your municipality's risk from this hazard is greater than the county's risk as a whole
- < Your municipality's risk from this hazard is less than the county's risk as a whole
- = Your municipality's risk from this hazard is about the same as the county's risk as a whole



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Next Steps

- Complete Municipal Worksheets
- Finalize Risk Assessment
- Develop Mitigation Goals and Objectives
- Conduct Mitigation Strategy Development Workshop
- Identify Mitigation Actions



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Questions?

Thank you for your time!



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Contacts



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 (717) 839-5654



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AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Risk Assessment Review Meeting

Monday, November 9, 2020 | 10:00 a.m. – 12:00 p.m.

-
1. **Welcome**

 2. **Worksheet Completion Status**

 3. **Risk Assessment Results**
 - a. Hazard Profiles
 - b. Risk Factor Analysis

 4. **Next Steps**
 - a. Mitigation Actions Handout
 - b. Mitigation Solutions Workshop

 5. **Questions**





AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Risk Assessment Review Meeting

Monday, November 9, 2020 | 6:00 p.m. – 8:00 p.m.

-
1. **Welcome**

 2. **Worksheet Completion Status**

 3. **Risk Assessment Results**
 - a. Hazard Profiles
 - b. Risk Factor Analysis

 4. **Next Steps**
 - a. Mitigation Actions Handout
 - b. Mitigation Solutions Workshop

 5. **Questions**



Chester County Planning Team
Risk Assessment Review Meeting

Worksheet Completion Status

Municipality	Hazard Evaluation Survey	Capability Assessment Survey	Mitigation Strategy Survey	Municipal Mitigation Strategy Survey	NFIP Survey
Chester County					N/A
Atglen Borough					
Avondale Borough					
Birmingham Township					
Caln Township	X	X	X	X	X
Charlestown Township					
Coatesville City					
Downingtown Borough					
East Bradford Township	X	X	X	X	X
East Brandywine Township		X	X	X	X
East Caln Township					
East Coventry Township					
East Fallowfield Township					
East Goshen Township	X	X	X	X	X
East Marlborough Township					
East Nantmeal Township					
East Nottingham Township					
East Pikeland Township	X	X	X	X	X
East Vincent Township					
East Whiteland Township	X	X	X	X	X
Easttown Township				X	
Elk Township					
Elverson Borough	X				
Franklin Township					
Highland Township					
Honey Brook Borough	X	X			X
Honey Brook Township	X	X			X
Kennett Square Borough					
Kennett Township	X	X	X	X	X
London Britain Township	X	X	X	X	X
London Grove Township	X	X	X	X	X
Londonderry Township	X	X	X	X	X
Lower Oxford Township	X	X	X	X	X
Malvern Borough				X	
Modena Borough					
New Garden Township	X	X			X
New London Township					

Chester County Planning Team
Risk Assessment Review Meeting

Municipality	Hazard Evaluation Survey	Capability Assessment Survey	Mitigation Strategy Survey	Municipal Mitigation Strategy Survey	NFIP Survey
Newlin Township					
North Coventry Township	X	X	X		X
Oxford Borough	X	X		X	
Parkesburg Borough	X	X	X	X	X
Penn Township					
Pennsbury Township	X	X	X	X	X
Phoenixville Borough					
Pocopson Township					
Sadsbury Township					
Schuylkill Township					
South Coatesville Borough					
South Coventry Township					
Spring City Borough					
Thornbury Township	X	X	X		X
Tredyffrin Township					
Upper Oxford Township					
Upper Uwchlan Township	X	X	X	X	X
Uwchlan Township					
Valley Township					
Wallace Township					
Warwick Township					
West Bradford Township					
West Brandywine Township					
West Caln Township	X	X	X		X
West Chester Borough	X	X	X	X	X
West Fallowfield Township					
West Goshen Township	X	X	X	X	X
West Grove Borough	X	X		X	
West Marlborough Township					
West Nantmeal Township	X				
West Nottingham Township	X	X	X	X	X
West Pikeland Township					
West Sadsbury Township					
West Vincent Township					
West Whiteland Township	X	X		X	X
Westtown Township					
Willistown Township	X			X	

Chester County Planning Team
Risk Assessment Review Meeting

Summary of Risk Factor (RF) Approach				
Risk Assessment Category	Degree of Risk			Weight Value
	Level	Criteria	Index	
PROBABILITY <i>What is the likelihood of a hazard event occurring in a given year?</i>	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1% & 49.9% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 50% & 90% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	GREATER THAN 90% ANNUAL PROBABILITY	4	
IMPACT <i>In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?</i>	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT <i>How large of an area could be impacted by a hazard event? Are impacts localized or regional?</i>	NEGLECTIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10.9% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 11 & 25% OF AREA AFFECTED	3	
	LARGE	GREATER THAN 25% OF AREA AFFECTED	4	
WARNING TIME <i>Is there usually some lead time associated with the hazard event? Have warning measures been implemented?</i>	MORE THAN 24 HRS	SELF-DEFINED	1	10%
	12 TO 24 HRS	SELF-DEFINED	2	
	6 TO 12 HRS	SELF-DEFINED	3	
	LESS THAN 6 HRS	SELF-DEFINED	4	
DURATION <i>How long does the hazard event usually last?</i>	LESS THAN 6 HRS	SELF-DEFINED	1	10%
	LESS THAN 24 HRS	SELF-DEFINED	2	
	LESS THAN 1 WEEK	SELF-DEFINED	3	
	MORE THAN 1 WEEK	SELF-DEFINED	4	

Example Equation

$$\text{RF Value} = [(\text{Probability} \times .30) + (\text{Impact} \times .30) + (\text{Spatial Extent} \times .20) + (\text{Warning Time} \times .10) + (\text{Duration} \times .10)]$$

Chester County Planning Team
Risk Assessment Review Meeting

HAZARD RISK	HAZARDS	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Utility Failure	4	3	4	4	2	3.5
	Flood, Flash Flood, and Ice Jams	4	4	1	3	3	3.2
	Opioid Epidemic	4	4	1	4	1	3.1
	Pandemic	2	4	4	1	4	3.1
	Tornadoes and Windstorms	3	3	4	4	1	3.1
	Environmental Hazards	4	3	1	4	2	2.9
	Invasive Species	4	1	4	1	4	2.8
	Terrorism	4	3	1	4	1	2.8
	Extreme Temperatures	4	1	4	1	3	2.7
	Winter Storms	3	2	4	1	3	2.7
	Pipeline Incidents	4	2	1	4	2	2.6
Drought and Water Supply Deficiencies	3	1	4	1	4	2.5	
MODERATE	Transportation Accidents	4	1	2	4	1	2.4
	Radon Exposure	3	1	3	1	4	2.3
	Earthquake	2	1	4	4	1	2.2
	Structural Fires	4	1	1	4	1	2.2
	Hurricane and Tropical Storms	2	1	4	1	3	2.1
LOW	Nuclear Incidents	1	2	2	4	2	1.9
	Dam Failure	1	1	1	3	2	1.3

Jurisdiction Risk - _____ (Municipality)

Hazard Category	County Risk	Municipality Risk
Dam Failure	2.9	1.3
Drought & Water Supply Deficiencies	2.5	2.5
Earthquake	2.2	2.2
Environmental Hazards Hazardous Materials Release	2.9	2.9
Extreme Temperatures	2.7	2.7
Flood, Flash Flood, and Ice Jam	3.2	3.2
Hurricane and Tropical Storm	2.1	2.1
Invasive Species	2.8	2.8
Nuclear Incident	1.9	1.9
Opioid Addiction Response	3.1	3.1
Pandemic & Infectious Disease	3.1	3.1
Environmental Hazard Gas & Liquid Pipelines	2.6	2.6
Radon Exposure	2.3	2.3
Structural Fires	2.2	2.2
Terrorism	2.8	2.8
Tornado, Windstorm	3.1	3.1
Transportation Accident	2.4	2.4
Utility Interruption	3.5	3.5
Winter Storm	2.7	2.7

- > Your municipality’s risk from this hazard is greater than the county’s risk as a whole
- < Your municipality’s risk from this hazard is less than the county’s risk as a whole
- = Your municipality’s risk from this hazard is about the same as the county’s risk as a whole



Please provide the following information for the update of actions and initiatives for your mitigation strategy. Suggested actions have been developed based on an analysis of Chester County’s needs and capabilities or were carried over from the previous hazard mitigation plan (HMP) update. If questions do not apply to your municipality, please indicate with N/A.

Hazards being profiled in the HMP are dam failure, drought and water supply deficiencies, earthquake, environmental hazards (hazardous materials releases), extreme temperatures, flood, flash flood, and ice jams, hurricanes and tropical storms, invasive species, nuclear incident, opioid addiction response, pandemic and infectious disease, environmental hazard gas and liquid pipelines, radon exposure, structural fires, terrorism, tornado and windstorm, transportation accidents, utility interruption, and winter storms.

Please provide as much detail as possible so that mitigation actions can be expanded and customized for your municipality to accurately reflect your capabilities and methods of operation.

1. Which properties in your jurisdiction are most at-risk from flood events and would have the greatest need for retrofitting or other flood hazard mitigation measures? All repetitive loss and severe repetitive loss properties should be included. Specific property addresses need not be listed (to ensure residential privacy), but names of streets or neighborhoods can be included.

2. What public outreach and education actions would you be most interested in implementing?
 - A. Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.
 - B. Provide hazard and risk reduction information through social media channels and e-mail blast systems.
 - C. Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.
 - D. Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.
 - E. Encourage regular offerings of the American Red Cross Citizen’s Disaster Course and other relevant classes.
 - F. Encourage private business owners and managers of infrastructure that provide critical services in post-disaster situations to develop Continuity of Operations Plans or Business Continuity Plans.
 - G. Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.
 - H. Other:

3. Which roads would benefit from mitigation or structural projects to reduce vulnerability to flood or stormwater incidents? Also, please specify the types of projects that would most help a high-risk road (for example, new/expanded culvert, road elevation, repaving, etc.), if this information is available.



4. What areas in the municipality are still in need of stormwater rehabilitation and upgrades?

5. Which areas of your municipality concern you regarding hazardous materials (HazMat) releases, whether from a fixed facility, pipeline, natural gas wells, or transportation accident?

6. Which roads would benefit from mitigation or structural projects to reduce vulnerability to HazMat incidents? Also, please specify the types of projects that would most help a high-risk road (for example, lower speed limits), if this information is available.

7. What areas of your municipality have undergone landslides, or are you worried that landslides will happen? What structures or infrastructure is under threat from this?

8. Where in your municipality have land subsidence or sinkholes occurred? What facilities or infrastructure is under threat from this?

9. What facilities are you concerned could be targets of a terrorist attack?

10. What roads or intersections in the municipality are considered high-risk and would benefit from improved design, routing, and traffic control functions? To which hazards (if any) are these roads most vulnerable?

11. Which critical facilities still need or would benefit from a backup generator or redundant power supply?

12. In what other mitigation projects are you interested or targeting for completion during the next 5 years? Please provide as much detail as possible.



MEETING NOTES

Meeting	Chester County Hazard Mitigation Plan (HMP) Update Mitigation Strategy Workshop		
Date	December 9, 2020	Time	10:00 a.m. – 12:00 p.m.
Location	Microsoft Teams Webinar		
Attendees	Beau Crowing, Director of Operations, Chester County DES		
	Mike Groover, Acting Deputy Director for Emergency Management, Chester County Department of Emergency Services (DES)		
	BJ Meadowcroft, DES Deputy Director of Fire Services		
	Gabby Ratliff, Emergency Planning Coordinator, Chester County DES		
	Jason Suydam, Deputy Director of Law Enforcement Services, Chester County DES		
	Bill Turner, Deputy Director for Emergency Management, Chester County DES		
	Cameron Zettlemyer, Emergency Planner, Chester County DES		
	Zach Nelson, Chester County Department of Community Development		
	David Sassa, Chief of Detectives, Chester County Detectives		
	Robyn Slater, Public Health Advocate, Chester County Health Department		
	Carrie Conwell, Senior Environmental Planner, Chester County Planning Commission		
	Carol Stauffer, Assistant Director, Chester County Planning Commission		
	James Brooks, Captain, Chester County Prison		
	Seung Ah Byun, Executive Director, Chester County Water Resources Authority		
	Craig Thomas, Field Engineering and Operations, Chester County Water Resources Authority		
	Cory Trego, Chester County Water Resources Authority		
	Caren Andrews, Manager, Secretary, Atglen Borough		
	Bill Shore, EMC, Avondale Borough		
	Garry Alderman, EMC, Coatesville City		
	Mandie Cantlin, Manager, East Bradford Township		
	Chris Obenchain, EMC, East Caln Township		
	John Reynolds, Jr., EMC, East Nottingham Township, Oxford Borough, and West Nottingham Township		
	Loren Nafziger, EMC, East Whiteland Township		
	Rob Schnorr, EMC, Easttown Township		
	Milt Rudy, Elk Township		
	Harold Walls, EMC, Franklin Township		
	John Morris, EMC, Kennett Square Borough		
Eden Ratliff, Manager, Kennett Township			
Carolyn Matalon, Secretary, London Britain Township			
Robert Weer, EMC and Fire Marshal, London Grove Township			



MEETING NOTES

Attendees

Lou Simone, Supervisor, Londonderry Township
Corinne Badman, EMC, Malvern Borough
Guy Swift, EMC, New Garden Township
Erica Batdorf, Manager, North Coventry Township
Matthew Galamba, EMC, North Coventry Township
Bob Ketcham, Council, Oxford Borough
Kevin Gosselin, EMC, Pocopson Township
Renee Carey, Councilwoman, South Coatesville Borough
Judy Lizza, Township Manager, Thornbury Township
Mike Beaty, EMC, Treddyffrin Township
Charles Fleischmann, Supervisor, Upper Oxford Township
Scott Greenly, Manager, Uwchlan Township
Michael Holmes, EMC, Uwchlan Township
Jim Lucas, EMC, West Bradford Township
Unidentified staff from the West Brandywine Township Office
Dave Garver, EMC, West Caln Township
Candace Miller, Supervisor/Secretary/Treasurer, West Nottingham Township
Don Verdiani, EMC, Westtown Township
Marty McKenzie, EMC/Finance Director, Willistown Township
Martha Madanat, Administrative Assistant, Bishop Shanahan High School
Raymond Stackhouse, Fire Chief, Caln Township/Parkesburg Borough/West Sadsbury Township
Tim Hubbard, Charlestown Township and Downingtown School District
David Busch, Executive Director, Downingtown Municipal Water Authority and Oxford Area Sewer Authority
Ellen Turk, School Safety and Security Coordinator, Easttown/Tredyffrin Township
Matt Wagner, Interim EMS Chief, Minquas Fire Co. EMS
Brandon Daniels, Chief, Owen J Roberts School Police
Michael Price, Athletic Director, Oxford School District
Ric Rice, Supervisor of Custodians, Phoenixville School District
Sarah Kerins, Principal, Pope John Paul II Regional Catholic Elementary School
Patricia O'Donnell, Principal, Saint Patrick School
Scott Alexander, Chief of Police, Uwchlan Township Police Department
Zeke Spillane, Director of Facilities, Villa Maria Academy High School
Jeff Kimes, Chief, West Brandywine Township Police



MEETING NOTES

Attendees	Rik Thornton, Public Safety Supervisor, West Chester Area School District
	Krista Scheirer, Environmental Specialist, Aqua
	Janet Zeis, Director, Agency and Community Partnerships
	Meredith Mayer Braine, Associate Planner, Brandywine Conservancy
	Scott Tallman, Safety Manager, Krapf Transportation
	Rupert Rossetti, President, Octoraro Watershed Association
	Brian McDonough, Regional Emergency Manager, Region 3 Amtrak
	Jonathan Ewald, TMACC, CHESCOBUS
	Stephanie Miller, Senior Vice President, United Way of Chester County
	Pete Hughes, President, Valley Forge Trout Unlimited
	Jim Leonard, President-elect, Valley Forge Trout Unlimited
	Cory Scheibe, Safety Manager, Vanguard
	Jake Geibert, West Pharmaceutical Services
	Dave Martin
	Eileen Moran
Stefanie Chumley, Tetra Tech	
Tony Subbio, Tetra Tech	

Discussion Points

This section summarizes each discussion point addressed during the Mitigation Strategy Workshop.

Welcome

Ms. Ratliff welcomed attendees to the meeting. Attendees introduced themselves.

Worksheet Completion Status

Mr. Subbio stated that information from 16 municipalities is still needed.

Municipal Risk Factor Analysis

Mr. Subbio explained the risk factor analysis worksheet that was emailed earlier. Attendees are to complete the worksheet, which is designed to assess the level of risk from each hazard associated with their respective municipalities as compared to the risk from each hazard to the county as a whole.

Review Existing Mitigation Strategy

Mr. Subbio reviewed the goals from the 2015 HMP. About 38 of the municipalities reported on the progress of the mitigation actions of the 2015 plan. From the information received, most of the mitigation action progress came from actions included in the plan that are continuously implemented. Those actions reflect capability, so they will be removed from the plan. Mr. Subbio also explained that, on the worksheet, actions marked as



MEETING NOTES

“Completed” or “Discontinued” will be removed from the plan, and that actions marked as “In Progress/Not Yet Complete,” or “No Progress/Unknown” will likely be included in the updated HMP.

Mr. Verdiani asked where he could see the 2015 goals/actions. Mr. Subbio explained it is on the HMP website, as well as in the PDF files and worksheets sent out at the beginning of the planning process. Mr. Subbio and Ms. Ratliff will resend worksheets and goals to Mr. Verdiani.

Mr. Galamba asked where he could find the checklist of participating municipalities that have completed worksheets. Ms. Ratliff explained that the list was sent out in November, but said she would send out an updated list after this meeting.

Develop the Updated Mitigation Strategy

Mr. Subbio explained the purpose of the mitigation strategy was to reduce the likelihood of hazard impacts as well as lessen any impacts. He explained that the suggested 2021 goals and objectives were sent out via email. They are similar to the 2015 goals but, based on experience with other Pennsylvania counties and the State HMP, Tetra Tech presented a set of suggested goals and objectives to the Steering Committee for review. Mr. Subbio went over the suggested 2021 goals and objectives and gave examples of potential actions for each.

Mr. Rudy had a question about the example for goal 2, indicating that homeowners disclose potential property hazards to prospective buyers. He mentioned many homeowners may be unaware of the vulnerabilities their property may face and asked if there is a resource they could use to get that information. Mr. Subbio said the FEMA Map Service Center could be used to determine whether the property is in the floodplain. For other hazards, no specific resource exists; however, FEMA is developing a national risk index that can be searched by municipality. The HMP will include hazard maps and show what areas are vulnerable to each hazard. Residents can get a general idea of the vulnerabilities of a particular property. Mr. Rudy said a potential action could be the development of an outreach and awareness program where residents and potential homeowners could access information to identify any potential risks.

Mr. Subbio explained the three different funding streams: Hazard Mitigation Grant Program, Flood Mitigation Assistance Grant, and the Building Resilient Infrastructure and Communities Program.

Mr. Subbio asked the participants to think about problems in their municipality. The email included an attachment containing list of problem statements and problem areas gathered from meetings, worksheets, and critical facilities that are exposed to hazards.

Attendees then discussed problems that hazards pose throughout the county, and each municipality's needs for mitigation. Key areas identified during the discussion are listed below:

- Ms. Ratliff stated that she has had several conversations that surrounding stormwater management. A lot of municipalities are trying to come up with ideas on how to make it less of an issue for traffic, infrastructure, and first responders.
- Mr. Trego stated that the Water Resources Authority is in the process of updating the county's countywide Act 167 Stormwater Management Plan, which contains a model ordinance. The Authority has an RFP out to bid for assistance developing an updated model ordinance. The county is in the process of updating their ordinance to make sure it aligns with the Division of Public Safety (DPS). The county is trying to incorporate climate change into the ordinance and the stormwater management plan.



MEETING NOTES

Mr. Trego mentioned that municipalities should encourage the adoption of low-impact development design and green infrastructure for any development. The existing model includes designing for a storm with a water quality control requirement, decreasing a 5-year predevelopment runoff event to a 2-year runoff event. Also, predevelopment runoff conditions should be maintained. Mr. Trego does not think the county has requirements for managing anything over a 100-year event.

- Ms. Scheirer mentioned that it is important to think about not only the actual flood waters but also what they may contain, such as chemicals from spills along transportation corridors.
- Mr. Leonard said that for the environmental hazards and hazardous materials releases, we should be focused on waterways and streams as well. Sewage from breaks in the sewer or water mains leaks into streams and kills everything. Mr. Subbio asked if Mr. Leonard has any best management practices that he has seen for protecting the waterways. Mr. Leonard replied that responding rapidly to the contamination would be crucial. Mr. Trego added that when utility lines are installed into the ground, they usually pass underneath streams. Utility companies are not necessarily thinking about how a stream channel will change over time (decrease in elevation, size). This is common in the county where there are a lot of urbanized areas with flash floods and erosion after storms. A solution would be to have a geomorphologist present when installing a utility line under a stream to calculate how deep the utility line should be, taking into account stream changes such as erosion. Other solutions include practices to stabilize the channel and the stream bed, elevations and prevent them from being exposed to sewage lines, and stabilize the channel from moving laterally one way or another. Mr. Subbio said this would be a good idea to add into the HMP.
- Mr. Fleischmann explained that using the timber and trees and riparian buffers may not be reliable because timber harvesting is a permitted activity in all zoning districts. Trying to regulate harvesting would include contending with the Agriculture, Communities and Rural Environment Act (ACRE) and may be an issue to think about. Mr. Subbio said that when you look at a floodplain ordinance, harvesting timber would be considered development in the floodplain under the NFIP. It would be subject to the requirements of the ordinance as well. Ms. Stauffer added that timber harvesting is considered an agricultural operation under ACRE.
- Mr. Trego mentioned the bridge on White Horse Road (located between Rabbit Run Road and Grubb Mill Road) in Willistown that crosses Crum Creek floods often. The road has to close, and a resident's property and driveway gets flooded and they cannot leave their house. There have been many complaints in the past 15-18 months. Mr. Subbio explained that a set of actions could be developed, including acquiring that residence and turning it into open space or redesigning the bridge itself.
- Mr. Hughes said to carefully choose the design of upgrading culverts, so they enable fish passage. Several culverts block fish and it is a big problem. He also mentioned that, a review should be conducted to determine what was done or what plans to be done with the Turnpike sections and widening them for different townships for stormwater management projects. Mr. Trego said they encourage the design to incorporate a 100-125-year flood event. So, using the natural channel dimensions and trying to match that as best as possible is going to be good for fish passage as well as flood mitigation.



MEETING NOTES

- Mr. Ratliff talked about the Spotted Lanternfly and how Phoenixville has been progressive in getting information out to the public on what to do.
- Ms. Slater suggested adding language to the plan in the Pandemic hazard profile that addresses the whole community and considers all the different types of vulnerable populations. Continuity planning is important to make sure people have plans, because she gets a lot of calls from organizations that do not have plans. Also, long-term effects of incidents are important to add as well.
- Mr. Subbio explained that building codes for new construction could include requirements for installing radon fans. Also, to mitigate radon exposure, steps should be taken to educate people with older homes and to retrofit houses or businesses with radon fans.
- Mr. Subbio suggested that for structural fires, it may help to increase capabilities and staffing at the local fire departments by providing incentives for recruiting and retaining volunteer firefighters. Examples include local tax credits or deductions or other financial incentives.
- Mr. Subbio gave examples of terrorism mitigation actions, such as protecting the targets with physical barriers, setting up concrete barriers or fences, or even using trees. Having continuity plans in place is also a potential action.
- Mr. Verdiani identified back-up water supply for individual well failures/contamination should be included.
- Mr. Nafziger explained that reception centers can be used for emergency incidents/evacuations or as warming or cooling centers. Additionally, the reception centers should keep COVID-19 restrictions in mind when they are used.
- Mr. Hughes asked if the municipalities can go easy on the salt during winter storms. Salt is the number one pollutant in streams. Mass amounts of salt are dumped on the roads and entering waterways. Mr. Trego added that he notices a lot of accumulation often occurs at stop lights and stop signs, as if the workers forget to turn off the spreader while they are stopped.
- Mr. Rudy brought up COVID-19 response and asked about information on the distribution of vaccines. Ms. Slater said that they have been planning for a vaccine since the summer and once they get more information about the quantity of vaccines, they will review locations for open points of dispensing (POD). These PODs will likely be at community sites, such as schools with organizations that have agreements with them. They are looking at all distribution methods.
- Ms. Carey had a question about the MS4 requirements and the cutting of trees, which has caused significant runoff. She wondered how they plan to contain the extra water since the county issues these permits and people in South Coatesville Borough can cut down trees. Mr. Trego answered by saying the members of Christina Watershed Municipal Partnership have been trying to plant more trees. Many trees have been cut down because they impact overhead utility lines or sidewalks. Planting new trees near the locations of previous trees, either upslope or down, to capture stormwater runoff or planting shrubby trees to collect water is a feasible solution. Ms. Byun added that municipalities can also look into adopting riparian buffer ordinances, tree ordinances, and timber harvesting regulations. Ms. Carey



MEETING NOTES

added that it is a country setting without sidewalks and the road acts like a mini river when it rains, overwhelming the drains.

Next Steps

Mr. Subbio reviewed the following next steps in the HMP update process with attendees:

- Mr. Subbio explained the Mitigation Action Worksheet for municipalities to fill out.
- Municipalities and other stakeholders will submit their mitigation actions to Ms. Ratliff and Mr. Subbio by December 23, 2020.
- The HMP draft will be completed by January 2021.
- The plan will be available for public review for 30 days following completion.
- A public meeting to review the complete draft will be held after the public comment period.
- After the public meeting, the plan will be finalized and submitted to PEMA for formal review.
- The plan will then be updated, based on PEMA's comments, and submitted to Federal Emergency Management Agency (FEMA) Region III for review.

With no further questions, Ms. Ratliff and Mr. Subbio thanked attendees for their time and participation. The meeting concluded at 12:00 p.m.



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**Chester County
Hazard Mitigation Plan (HMP)
Update
Mitigation Strategy Workshop**

1

Welcome

- If you are attending the webinar on your computer, please add your name, title, and organization(s) to the Chat.
 - Bring your mouse to the lower part of the screen until a set of buttons appears. They might also be at the top-right of your screen.
 - Click “Show Conversation.”

2

Agenda

- Welcome
- Information Required
- Municipal Risk Factor Analysis
- Review Existing Mitigation Strategy
- Develop the Updated Mitigation Strategy
- Next Steps
- Questions

3

Information Required

- Opportunities
 - Meetings
 - Worksheet completion
 - One-on-one contact
- Still need information from 16 municipalities

4

Municipal Risk Factor Analysis

- Risk Factor Analysis

HAZARD	HAZARD	RISK ASSESSMENT CATEGORY				RISK SCORE (PT)	
		Frequency	Severity	Exposure	Vulnerability		
Major	Wildfire	4	3	4	4	2	24
	Flash Flood, Flood, and Ice Dam	4	4	1	3	3	19
	Storm Surge	4	4	1	4	1	17
	Thunder	2	4	4	3	4	14
	Coastal and Inland Flooding	3	3	4	4	1	13
	Environmental Hazards	4	3	1	4	2	18
	Severe Tornado	4	3	4	1	4	17
	Seismic	4	3	1	4	1	14
	Extreme Temperature	4	1	4	1	3	17
	Water Shortage	3	2	4	1	3	17
Minor	Power Outages	4	2	1	4	2	18
	Chemical Spills	3	1	4	1	4	14
	Transportation Accidents	4	1	2	4	1	14
	Radioactive	3	1	3	3	4	13
Moderate	Earthquake	2	1	4	4	1	12
	Structural Fail	4	1	1	4	1	12
Low	Storm and Tropical Storms	2	1	4	1	3	10
	Water Shortage	1	2	2	4	2	10
Low	Open Pools	1	1	1	3	2	10

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Municipal Risk Factor Analysis

- Municipal Risk Factor Analysis

Jurisdiction Risk - _____ (Municipality)

HAZARD	County Risk	Municipality Risk
Wildfire	24	24
Flash Flood, Flood, and Ice Dam	19	19
Storm Surge	17	17
Thunder	14	14
Coastal and Inland Flooding	13	13
Environmental Hazards	18	18
Severe Tornado	17	17
Seismic	14	14
Extreme Temperature	17	17
Water Shortage	17	17
Power Outages	18	18
Chemical Spills	14	14
Transportation Accidents	14	14
Radioactive	13	13
Earthquake	12	12
Structural Fail	12	12
Storm and Tropical Storms	10	10
Water Shortage	10	10
Open Pools	10	10

- > Your municipality's risk from this hazard is greater than the county's risk as a whole
- < Your municipality's risk from this hazard is less than the county's risk as a whole
- = Your municipality's risk from this hazard is about the same as the county's risk as a whole

6



Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - All
 - Public outreach to increase awareness of hazards and actions people can take
 - Dam Failure
 - Same as for flooding
 - Drought and Water Supply Deficiencies
 - Develop plans/agreements among water suppliers
 - Earthquake
 - Enhance building codes
 - Retrofit structures



13

13

Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - Environmental Hazards – Hazardous Materials Releases
 - Work with critical facilities to ensure plans are in place.
 - Environmental Hazards – Pipelines
 - Work with critical facilities to ensure plans are in place.
 - Extreme Temperatures
 - Develop capabilities for warming/cooling centers.



14

14

Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - Floods, Flash Floods, and Ice Jams
 - Stormwater management
 - Enhance stormwater management regulations
 - Upgrade pipes/culverts
 - Upgrade/replace bridges
 - Enhance floodplain management regulations
 - Clear debris
 - Property acquisition – create/protect open space
 - Floodproof structures
 - Fill basements
 - Protect wetlands and other natural areas
 - Vulnerable critical facilities
 - Protect public critical facilities
 - Work with owners of privately-owned



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Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - Hurricane and Tropical Storms
 - See flood and tornado, windstorm
 - Invasive Species
 - Public education campaign and work with PA DCNR, Forestry, etc.
 - Nuclear Incidents
 - Promote individual emergency planning
 - Opioid Epidemic
 - Promote service providers
 - Equip response agencies with counter-acting agents
 - Pandemic
 - Increase capabilities to distribute prophylaxis
 - Enhance telecommunications infrastructure
 - Continuity planning



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Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - Radon Exposure
 - Enhance building codes
 - Structural Fires
 - Incentives to recruit and retain volunteer firefighters
 - Enhance building codes
 - Terrorism
 - Physical barriers at potential targets
 - Landscaping at potential targets
 - Continuity planning



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Develop the Updated Mitigation Strategy

- Mitigation Action Examples
 - Tornadoes and Windstorms
 - Enhance building codes
 - Retrofit structures
 - Transportation Accidents
 - Redesign intersections/corridors
 - Utility Interruption
 - Backup generators at critical facilities
 - Battery backup at traffic lights, telecommunications infrastructure
 - Continuity planning
 - Winter Storms
 - Retrofit structures
 - Enhance building codes



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Develop the Updated Mitigation Strategy

Mitigation Action Worksheet

Municipality(ies):	Action
Action Number:	
Location (address, lat/long)	
Mitigation Technique Category	
Priority Addressed	
Priority (High, Medium, Low)	
Estimated Cost	
Potential Funding Sources	
Title/Date	
Lead Agency/Department	
Support Agency(ies)/Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



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Next Steps

- Identify and Submit Mitigation Actions ***by December 23, 2020***
- Solicit Additional Participation
- Finalize the Draft HMP
- Provide Public Comment Period
- Conduct Draft Review Meeting
- Submit Plan Update to Pennsylvania Emergency Management Agency (PEMA)
- Submit Plan Update to Federal Emergency Management Agency (FEMA)



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Questions?

Thank you for your time!



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Contacts



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AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Mitigation Strategy Workshop

Wednesday, December 9, 2020 | 10:00 a.m. – 12:00 p.m.

-
1. **Welcome**

 2. **Information Required**

 3. **Municipal Risk Factor Analysis**

 4. **Review Existing Mitigation Strategy**
 - a. Goals and Objectives Review
 - b. Status of 2015 Mitigation Actions

 5. **Develop the Updated Mitigation Strategy**
 - a. Purpose of the Mitigation Strategy
 - b. Suggested Goals and Objectives
 - c. Categories of Mitigation Actions
 - d. Identify Mitigation Actions
 - e. Problems and Problem Areas
 - f. Mitigation Action Examples
 - g. Mitigation Action Worksheet

 6. **Next Steps**
 - a. Identify and Submit Mitigation Actions
 - b. Solicit Additional Participation
 - c. Finalize the Draft HMP
 - d. Provide Public Comment Period
 - e. Conduct Draft Review Meeting
 - f. Submit Plan Update to PEMA
 - g. Submit Plan Update to FEMA

 7. **Questions**



Chester County Planning Team
Mitigation Strategy Workshop

Information Required – Provided via Worksheets and/or Discussion

Municipality	Hazard Eval. Survey	Capability Assess. Survey	Mit. Strategy Survey	Mun. Mit. Strategy Survey	NFIP Survey	1-on-1 Contact
Chester County					N/A	
Atglen Borough						X
Avondale Borough						
Birmingham Township						
Caln Township	X	X	X	X	X	
Charlestown Township						
Coatesville City						X
Downingtown Borough						X
East Bradford Township	X	X	X	X	X	
East Brandywine Township		X	X	X	X	
East Caln Township						
East Coventry Township						X
East Fallowfield Township						
East Goshen Township	X	X	X	X	X	
East Marlborough Township						
East Nantmeal Township						X
East Nottingham Township						
East Pikeland Township	X	X	X	X	X	
East Vincent Township						X
East Whiteland Township	X	X	X	X	X	
Easttown Township				X		
Elk Township						
Elverson Borough	X					
Franklin Township						X
Highland Township						X
Honey Brook Borough	X	X			X	
Honey Brook Township	X	X			X	
Kennett Square Borough	X			X	X	
Kennett Township	X	X	X	X	X	
London Britain Township	X	X	X	X	X	
London Grove Township	X	X	X	X	X	
Londonderry Township	X	X	X	X	X	
Lower Oxford Township	X	X	X	X	X	
Malvern Borough				X		
Modena Borough						
New Garden Township	X	X		X	X	
New London Township						
Newlin Township						
North Coventry Township	X	X	X		X	X
Oxford Borough	X	X		X		
Parquesburg Borough	X	X	X	X	X	

Chester County Planning Team
Mitigation Strategy Workshop

Municipality	Hazard Eval. Survey	Capability Assess. Survey	Mit. Strategy Survey	Mun. Mit. Strategy Survey	NFIP Survey	1-on-1 Contact
Penn Township						
Pennsbury Township	x	x	x	x	x	
Phoenixville Borough						
Pocopson Township						x
Sadsbury Township						x
Schuylkill Township						x
South Coatesville Borough						
South Coventry Township						
Spring City Borough						
Thornbury Township	x	x	x	x	x	
Tredyffrin Township						
Upper Oxford Township						
Upper Uwchlan Township	x	x	x	x	x	
Uwchlan Township						x
Valley Township						x
Wallace Township						
Warwick Township						x
West Bradford Township						x
West Brandywine Township	x					x
West Caln Township	x	x	x		x	x
West Chester Borough	x	x	x	x	x	
West Fallowfield Township						
West Goshen Township	x	x	x	x	x	
West Grove Borough						
West Marlborough Township						x
West Nantmeal Township	x					
West Nottingham Township	x	x	x	x	x	
West Pikeland Township						
West Sadsbury Township						
West Vincent Township						
West Whiteland Township	x	x		x	x	
Westtown Township						
Willistown Township	x			x		

Jurisdiction Risk - _____ (Municipality)

Dam Failure	Drought & Water Supply Deficiencies	Earthquake	Environmental Hazards Hazardous Materials Release	Extreme Temperatures	Flood, Flash Flood, and Ice Jam	Hurricane and Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic & Infectious Disease	Environmental Hazard Gas & Liquid Pipelines	Radon Exposure	Structural Fires	Terrorism	Tornado, Windstorm	Transportation Accident	Utility Interruption	Winter Storm
1.3	2.5	2.2	2.9	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.6	2.3	2.2	2.8	3.1	2.4	3.5	2.7

- > Your municipality’s risk from this hazard is greater than the county’s risk as a whole
- < Your municipality’s risk from this hazard is less than the county’s risk as a whole
- = Your municipality’s risk from this hazard is about the same as the county’s risk as a whole

2015 Hazard Mitigation Plan (HMP) Goals

No objectives were developed for the 2015 HMP.

Goal 1: Reduce personal and property disaster losses within Chester County.

Goal 2: Increase disaster resilience of public and private infrastructure.

Goal 3: Ensure that new construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards.

Goal 4: Identify, introduce, and implement cost effective hazard mitigation measures.

Goal 5: Raise awareness of and encourage participation in hazard mitigation within the community.

DRAFT

Suggested Goals and Objectives for the 2021 HMP

Goal 1: Prevent injury/death, physical damage, and other impacts from hazards in Chester County.

- Objective 1.1 Enhance regulations for development in hazard-prone areas.
- Objective 1.2 Upgrade infrastructure to reduce the likelihood of hazards from impacting Chester County.

Goal 2: Protect the citizens of Chester County as well as public and private property from the impacts of natural and human-caused hazards.

- Objective 2.1 Protect existing structures, including critical facilities, from damage that can be caused by hazards.
- Objective 2.2 Acquire, relocate, elevate, and/or retrofit existing structures, including repetitive loss properties, located in hazard areas.
- Objective 2.3 Improve and maintain stormwater management systems to reduce flooding.
- Objective 2.4 Encourage homeowners, renters, and businesses to insure their properties against all hazards, including flood coverage under the National Flood Insurance Program (NFIP).

Goal 3: To protect and restore existing natural resources including wetlands, floodplains, and riparian buffers.

- Objective 3.1 Lessen impacts on natural resources and open space from natural and human-caused hazards.
- Objective 3.2 Provide appropriate safeguards for the preservation of the quality of water resources, stream corridors, watershed areas, and floodplains.

Goal 4: To promote public awareness on the potential impacts of natural and non-natural hazards, and actions to reduce those impacts.

- Objective 4.1 Develop public education and outreach programs on hazards and hazard mitigation.
- Objective 4.2 Educate property owners in hazard-risk areas regarding their risks and the precautions they can take.
- Objective 4.3 Encourage residents to implement hazard mitigation and preparedness measures on their properties.
- Objective 4.4 Encourage local participation in the Community Rating System (CRS) Program.
- Objective 4.5 Develop and enforce a requirement for property sellers to disclose hazards that exist on the property to potential buyers.



Chester County

- There are many child-care facilities throughout the county vulnerable to hazards.
- There are several dams throughout the county that are vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- There are telecom facilities within the county vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.
- There are hospitals within the county that could be exposed to off-site hazmat releases and need plans in place to protect the facilities.
- There are courts within the county that could be exposed to off-site hazmat releases and need plans in place to protect the courts.
- There are many long-term care facilities throughout the county vulnerable to hazards.
- There are many intermediate care facilities throughout the county vulnerable to hazards.
- There are many senior living facilities throughout the county vulnerable to hazards.
- There are many higher education facilities throughout the county vulnerable to hazards.
- There are USPS offices throughout the county that are vulnerable to flooding and dam failure.
- Many schools throughout the county are vulnerable to hazmat releases.
- There are many major businesses throughout the county that are vulnerable to hazards.
- Smaller private/municipal water suppliers do not have plans in place to have water transferred in the event of a drought.
- There has been accelerated damaged to stormwater piping that is constructed of Corrugated Metal Pipe (CMP). The intensity of the stormwater flows is eroding and damaging the aging/thinning CMP causing buckling or complete failure resulting in sinkholes
- Number of firefighter volunteers, there is always a decline and hard to keep people.
- All municipal Emergency Operation Centers are vulnerable to hazmat, pipeline, and/or nuclear incidents.

Atglen Borough

- The historic structure located at SR 7401 in Atglen Borough is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- The Atglen Borough Sewer Plant is vulnerable to flooding. Critical facilities should be protected to the 0.2% annual chance flood event.
- There is a creek under the Main Street bridge that crosses Fallowfield Road, that overflows. Fallowfield Road floods and people cannot get access to their homes (streets that were blocked off include: Brook, Cattail, and Willow Streets).
- In Atglen Borough, there is an underpass that floods on Green Street.
- Truck traffic through the borough causes issues.
- SW of 41- Whitehorse Road: creek is prone to flooding due to debris – may be a problem because of PennDOT inlets being clogged.

Avondale Borough

- The Avondale Sewer Authority is vulnerable to flooding. Critical facilities should be protected to the 0.2% annual chance flood event.



Birmingham Township

- The following historical structures located in Birmingham Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Brinton's Mill
 - Lenape Bridge
 - Painter, Joseph Farm

Caln Township

- Caln Radio Tower is in the 1 percent annual chance flood level and vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- Downingtown Middle School is vulnerable to dam failures.
- There are major businesses vulnerable to flooding that should be protected to the 0.2% annual chance flood level.
- County Bridge No. 124 in Caln Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Charlestown Township

- The following historical structures located in Charlestown Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Pennsylvania Railroad: Bridge (No. 205)
 - Pickering Dam

Coatesville City

- The following historical structures located in Coatesville City are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - High Bridge
 - Huston, Abram, House & Carriage House
 - Lukens Main Office Building
- ArcelorMittal Emergency Services EMS Station is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to 0.2 percent annual chance flood level.

Downingtown Borough

- Jefferson Ave electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.



- The following historical structures located in Downingtown Borough are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Downingtown Log House
 - Hunt, Roger, Mill Complex
- Minquas Ambulance EMS Station is potentially exposed to dam failure. Critical facilities should be protected.
- Alert FC Fire Station is potentially vulnerable to dam failure. Critical facilities should be protected.
- Minquas FC Fire Station is potentially vulnerable to dam failure. Critical facilities should be protected.
- USMC facility is potentially exposed to flooding from a dam failure.
- There are several municipalities with SARA sites that are vulnerable to flooding/dam failure.
- the following schools are vulnerable to dam failures
 - St. Joseph School
 - Beaver Creek Elementary School
 - Downingtown High School West
 - STEM Academy
 - Step by Step Children’s House
 - East Ward Elementary School
 - Lori Petrie’s Pre School
 - Regina Luminis Academy
- There are major businesses vulnerable to dam failure.
- The Downingtown Borough Building located at 4 W Lancaster Ave is vulnerable to dam failure.
- The Downingtown Municipal Waste is vulnerable to flooding. Critical facilities should be protected.
- The Downingtown Rail Station is vulnerable to dam failure and needs to be protected.
- Worsening flooding issues, vehicles damaged, roads flooding and closed. The newer development is exacerbating the flooding issue, retention basins overflow. During large rain events, the stormwater infrastructure is overwhelmed and roads flood. After the rain, the water flows into the waterways and floods other roads.

East Bradford Township

- East Bradford electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- The following historical structures located in East Bradford Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Cope’s Bridge
 - East Bradford Historic District – HDA
 - Gibson’s Covered Bridge
 - Hance, Joseph, House & Barn
 - Hannum, Col. John, House



- Jefferis Ford Bridge
- Paradise Valley Historic District
- Storde's Mill
- Stordes Mill Historic District
- Taylor-Cope Historic District
- Good Fellowship Ambulance (Sub-Station) is potentially exposed to dam failure. Critical facilities should be protected.
- The Ingrams Mill Water Treatment Plant is vulnerable to flooding. Critical facilities should be protected.

East Brandywine Township

- The following historical structures located in East Brandywine Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Bridge Mill Farm
 - Dowlin Farm
 - Marshall's Bridge

East Caln Township

- The Downingtown Sewer Authority is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.

East Coventry Township

- East Coventry electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- A historical structure located on SR 7015 located in East Coventry Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

East Fallowfield Township

- The following historical structures located in East Fallowfield Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Bridge on Strasburg Rd
 - Speakman No.2
 - The Gorden Farm
- East Fallowfield electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.



East Goshen Township

- Goodwin Acres located in East Goshen Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

East Pikeland Township

- The following historical structures located in East Pikeland Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Bernard Property
 - Hare's Hill Road Bridge
 - Hartman, Peter, Residence
 - Kimberton Historic District (Boundary Increase)
 - Rapp's Covered Bridge
- Cromby electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

East Vincent Township

- The following historical structures located in East Vincent Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Kennedy Covered Bridge
 - Parker's Ford
- The Shady Lane Water Treatment Plant is vulnerable to flooding. Critical facilities should be protected.
- Areas along French Creek flood during heavy rains.

East Whiteland Township

- There are major businesses vulnerable to flooding that should be protected to the 0.2% annual chance flood level.
- Spring Mill Complex in East Whiteland Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Easttown Township

- Sugartown Rd Bridge in Easttown Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.



Elk Township

- The following historical structures located in Elk Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Glen Hope Covered Bridge
 - Rudolph & Author Covered Bridge
 - Stephens, Linton Covered Bridge

Franklin Township

- 512 Chesterville Road (could use for water to be diverted)
- North Clay Creek and Churchill road (flooding)
- Strickersville Rd and Appleton Road (flooding at Green Bridge)
- Blocked inlets at 896 between Goodhope Rd and Gypsy Hill (debris not removed from area, just inlet)

Honey Brook Borough

- Increased traffic flow in the 322 corridors has increased traffic accidents within the past few years
- Prolonged extended utility, data, and telecom disruptions

Honey Brook Township

- Increased traffic flow in the 322 corridors has increased traffic accidents within the past few years
- Prolonged extended utility, data, and telecom disruptions
- In Honey Brook Township along the West Branch of the Brandywine there is an intersection (Birdell and Beaver Dam Roads) always floods and closes during heavy rain events.

Kennett Township

- More extreme storms and heavier rainfall overwhelms the Red Clay and White Clay creeks
- Long lasting utility disruptions due to storm damage
- Kennett Township experienced a hurricane that came through and high-water event a couple days later. Streets were underwater, everything was overwhelmed, especially the east and west branches of the creek. Stormwater management regulations in place now, do not address the bigger events and systems get overwhelmed.
- In Kennett Township, there are 5-6 PennDOT and township roads following the stream (north south) that flood and close during heavy rain events as well as a lot of shoulder damage.
- In Kennett Township, new construction is more dangerous than older due to beams being made of wood not steel. It is a hazard for houses, firefighters, and people living there.

London Grove Township

- London Grove Township – The West Grove Sewage Treatment Plant is vulnerable to flooding. Critical facilities should be protected to the 0.2% annual chance flood event.



Lower Oxford Township

- The following historical structures located in Lower Oxford Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Octoraro Water Company
 - Pine Grove Covered Bridge

Malvern Borough

- Malvern Preparatory School is vulnerable to flooding and should be protected to the 0.2% annual chance flood level.
- Camilla Hall Nursing Home experiences power outages during windstorms due to downed trees and branches along Hershey Mill Road.

Modena Borough

- Modena Borough Building located at 5 N Brandywine Ave. is vulnerable to dam failure.
- Mode Paper Mill in Modena Borough is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- Modena Ambulance is potentially exposed to dam failure. Critical facilities should be protected.
- Modena FC Fire Station is potentially vulnerable to dam failure. Critical facilities should be protected.

New Garden Township

- To-jo Mushrooms Inc. is vulnerable to dam failure and flooding and should be protected to the 0.2% annual chance flood level.

Newlin Township

- The following historical structures located in Newlin Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Embreeville Historic District
 - House at Upper Laurel Iron Works
 - Marlborough Village Historic District
 - Spruce Grove School House
 - Worker's House at Lower Laurel Iron Works
- Newlin Township Building located at 1751 Embreeville Road is vulnerable to flooding.
- Embreeville Sewage Treatment Plant is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.

North Coventry Township

- The North Coventry Municipal Authority is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.



- The following historical structures located in North Coventry Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Schuylkill Navigation Company Canal
 - Historical Structure located at SR 7046

Oxford Borough

- More severe storms cause more utility outages

Parquesburg Borough

- N Church Street electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Penn Township

- Neward Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Pennsbury Township

- The following historical structures located in Pennsbury Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Bissel/Hill Girt/Beverly Rural Historic District
 - Delaware Boundary Markers

Phoenixville Borough

- The Phoenixville Water Treatment Plant is vulnerable to flooding. Critical facilities should be protected to the 0.2% annual chance flood event.
- The District Court 15-2-01 is vulnerable to flooding. Critical facilities should be protected to the 0.2% annual chance flood event.
- There are major businesses vulnerable to dam failure and flooding that should be protected to the 0.2% annual chance flood level.
- The following historical structures located in Phoenixville Borough are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Black Rock Bridge
 - Lobok, John, Property
 - Mansion House
 - Phoenixville Canal Spur



Pocopson Township

- The following historical structures located in Pocopson Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Pocopson Station
 - State Route 3027
 - Wilkinson House
- Flooding around Brandywine Creek on Northbrook Road (one lane bridge), historical bridge
- Lenape Unionville Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Sadsbury Township

- Greenbelt Drive: culvert and water , 100’ up from that runs into flooding issues

Schuylkill Township

- Pawling Woods in Schuylkill Township experiences severe flooding during storm events. Flooding occurs on Route 23 as well.
- The YMCA is vulnerable to flooding and should be protected to the 0.2% annual chance flood level.
- Valley Forge Sewage Treatment Plant is vulnerable to dam failure. Critical facilities should be protected.
- Valley Forge Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- Route 23 and State Creek Road
- Stormwater management is a concern; more houses are being flooded in particular communities.

South Coatesville Borough

- The Coatesville Sewer Authority is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.

South Coventry Township

- Porters Mill Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- The following historical structures located in South Coventry Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Coventryville Historic District
 - Coventryville Historic District (1975) -HDA



Spring City Borough

- Textile Mill in Spring City Borough is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- There are major businesses vulnerable to dam failure and flooding that should be protected to the 0.2% annual chance flood level.
- The Spring City Sewer Plant is vulnerable to dam failure. Critical facilities should be protected.

Thornbury Township

- Business and 30 in Thorndale's railroad underpasses flood 4-5 times during the year. Locations include Bailey Road near the train station and Wawa, and North and South Calen Road
- Westtown Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

Tredyffrin Township

- The following historical structures located in Tredyffrin Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Cedar Hollow Industrial Track: Bridge
 - County Bridge No. 171
 - Great Valley Mill
 - Jerman, Thomas, Property
 - Historical structure located at SR 7015

Upper Uwchlan Township

- Increased population is causing more traffic accidents, some involving HAZMAT

Valley Township

- The following historical structures located in Valley Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - County Bridge No. 101
 - Scott Farm Property

Wallace Township

- The following historical structures located in Wallace Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Glenmoore Historic District
 - Steels Bridge
- Glenmoore FC Fire Station is potentially vulnerable to dam failure. Critical facilities should be protected.



Warwick Township

- In Warwick Township, County Park Road off Route 23, near the Warwick Park, and Mt. Pleasant Road floods.
- The following historical structures located in Warwick Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Hockley Mill Farm
 - Knauer Patent Thematic District
 - North Warwick Historic & Archaeological District – HDA
 - North Warwick Historic & Archaeological District
 - Historical structure located on SR 7015

West Bradford Township

- The following historical structures located in West Bradford Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Derbydown Homestead
 - Northbrook Historic District
 - Pennsylvania Railroad: Morrisville Line: Viaduct (Brandywine Valley)
 - Trimbleville Historic District
- Ram-t Construction Specialist is vulnerable to dam failure.
- The Broad Run Sewage Treatment Plant is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.
- Roadway flooding: Broad Run Rd. between Beacon Hill

West Brandywine Township

- Increase in storms require additional attention to mitigation and recovery procedures
- New housing and commercial developments require additional attention to stormwater management during heavy rainfall
- Grow, James, House located in West Brandywine Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- Rt 82 and Reeseville Road - working with PENNDOT and Township

West Chester Borough

- National Foam is vulnerable to flooding and needs to be protected to the 0.2% annual chance flood level.

West Fallowfield Township

- Ross Fording Road Bridge in West Fallowfield Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.



West Goshen Township

- Culvert near Goose Creek under Montgomery Avenue by Henderson High School in West Goshen Township floods even during a thunderstorm. Culvert gets clogged up with debris and roads close due to flooding.
- Sinkholes in people’s backyards from deteriorating piping infrastructure.
- Greystone Hall located in West Goshen Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

West Marlborough Township

- Rt 82 (Unionville to Coatesville) - a couple of bridges flood
- The following historical structures located in West Marlborough Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - House at Springdell
 - Pennock, Martha House & Industrial Site (Boundary increase)
 - Speakman No. 1 Covered Bridge

West Nantmeal Township

- Isabella Furnace located in West Nantmeal Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.

West Nottingham Township

- West Nottingham has a dangerous intersection that has experienced many accidents and could potentially involve trucks carrying hazardous materials at Route 272 and Cemetery/Union Square Roads.

West Pikeland Township

- The following historical structures located in West Pikeland Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Anselma Mill District – HDA
 - Clinger-Moses Mill Complex
 - Lightfoot Mill
 - Vitale House

West Vincent Township

- The following historical structures located in West Vincent Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Halls Covered Bridge
 - Tyson’s Bridge



- Historical structure on Kimberton Rd

West Whiteland Township

- Increased flooding from more severe and frequent storms
- S Whitford Road electrical substation is located within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- The following historical structures located in West Whiteland Township are within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
 - Exon Hotel
 - Thomas, John Roberts, Tennant Farmstead
 - Turnpike Station House
 - Whitford Station House
 - William's Deluxe Cabins

Westtown Township

- County Bridge No. 148 located in Westtown Township is within the 1 percent annual chance flood level and vulnerable to flooding. Critical facilities should be protected to the 0.2 percent annual chance flood level.
- The Westtown Wastewater Treatment Plant is vulnerable to flooding and dam failure. Critical facilities should be protected to the 0.2% annual chance flood event.

Willistown Township

- Utility interruption due to fallen trees during wind and/or rain events.
- Water backs up under bridge and back into yard of a resident and flows around bridge in Willistown Township along White Horse Road where it crossed Crum Creek. The resident's driveway and garage were inundated a couple times and a vehicle lost.



Please provide the following information for the update of actions and initiatives for your mitigation strategy. Suggested actions have been developed based on an analysis of Chester County's needs and capabilities or were carried over from the previous hazard mitigation plan (HMP) update. If questions do not apply to your municipality, please indicate with N/A.

Hazards being profiled in the HMP are dam failure, drought and water supply deficiencies, earthquake, environmental hazards (hazardous materials releases), extreme temperatures, flood, flash flood, and ice jams, hurricanes and tropical storms, invasive species, nuclear incident, opioid addiction response, pandemic and infectious disease, environmental hazard gas and liquid pipelines, radon exposure, structural fires, terrorism, tornado and windstorm, transportation accidents, utility interruption, and winter storms.

Please provide as much detail as possible so that mitigation actions can be expanded and customized for your municipality to accurately reflect your capabilities and methods of operation.

1. Which properties in your jurisdiction are most at-risk from flood events and would have the greatest need for retrofitting or other flood hazard mitigation measures? All repetitive loss and severe repetitive loss properties should be included. Specific property addresses need not be listed (to ensure residential privacy), but names of streets or neighborhoods can be included.

2. What public outreach and education actions would you be most interested in implementing?
 - A. Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.
 - B. Provide hazard and risk reduction information through social media channels and e-mail blast systems.
 - C. Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.
 - D. Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.
 - E. Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.
 - F. Encourage private business owners and managers of infrastructure that provide critical services in post-disaster situations to develop Continuity of Operations Plans or Business Continuity Plans.
 - G. Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.
 - H. Other:

3. Which roads would benefit from mitigation or structural projects to reduce vulnerability to flood or stormwater incidents? Also, please specify the types of projects that would most help a high-risk road (for example, new/expanded culvert, road elevation, repaving, etc.), if this information is available.



4. What areas in the municipality are still in need of stormwater rehabilitation and upgrades?

5. Which areas of your municipality concern you regarding hazardous materials (HazMat) releases, whether from a fixed facility, pipeline, natural gas wells, or transportation accident?

6. Which roads would benefit from mitigation or structural projects to reduce vulnerability to HazMat incidents? Also, please specify the types of projects that would most help a high-risk road (for example, lower speed limits), if this information is available.

7. What areas of your municipality have undergone landslides, or are you worried that landslides will happen? What structures or infrastructure is under threat from this?

8. Where in your municipality have land subsidence or sinkholes occurred? What facilities or infrastructure is under threat from this?

9. What facilities are you concerned could be targets of a terrorist attack?

10. What roads or intersections in the municipality are considered high-risk and would benefit from improved design, routing, and traffic control functions? To which hazards (if any) are these roads most vulnerable?

11. Which critical facilities still need or would benefit from a backup generator or redundant power supply?

12. In what other mitigation projects are you interested or targeting for completion during the next 5 years? Please provide as much detail as possible.

Mitigation Action Worksheet

Municipality(ies):	Action
Action Number:	
<i>Location (address, lat/long)</i>	
<i>Mitigation Technique Category</i>	
<i>Hazard(s) Addressed</i>	
<i>Priority (High, Medium, Low)</i>	
<i>Estimated Cost</i>	
<i>Potential Funding Streams</i>	
<i>Timeline</i>	
<i>Lead Agency/Department</i>	
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



MEETING NOTES

Meeting	Chester County Hazard Mitigation Plan (HMP) Plan Draft Review Meeting		
Date	April 7, 2021	Time	6:00 – 7:15 p.m.
Location	Microsoft Teams Webinar		
Attendees	Beau Crowing, Director of Operations, Chester County DES		
	Heather DeStefano, Training and Exercises Coordinator, Chester County DES		
	Gabby Ratliff, Community Resilience Coordinator, Chester County DES		
	Carol Stauffer, Assistant Director, Chester County Planning Commission		
	Kelly Tinsman, Emergency Planning Coordinator, Chester County DES		
	Bill Turner, Deputy Director for Emergency Management, Chester County DES		
	Tammy Whiteman, ALS Coordinator, Chester County DES		
	Cameron Zettlemoyer, Emergency Planner, Chester County DES		
	Steven C. Farney, Engineer, Chester County Water Resources Authority		
	William Ronayne, EMC, East Bradford Township		
	John Reynolds, Jr., EMC, East Nottingham Township, Oxford Borough, and West Nottingham Township		
	Loren Nafziger, EMC, East Whiteland Township		
	Michael Wacey, Supervisor, Easttown Township		
	Milt Rudy, Supervisor and Acting EMC, Elk Township		
	Jeff Hammaker, EMC, Kennett Township		
	Robert Weer, EMC and Fire Marshal, London Grove Township		
	David Flad, Emergency Director, New London Township		
	Bob Ketcham, Assistant EMC, Oxford Borough		
	Peggy Ann Russell, Council President, Oxford Borough		
	Kevin Gosselin, EMC, Pocopson Township		
	Moujan Toloubadei, EMC, Schuylkill Township		
	Judy Lizza, Township Manager, Thornbury Township		
	Mike Beaty, EMC, Treddyffrin Township		
	Scott Piersol, Township Manager & Deputy EMC, Valley Township		
	Joe Dell'Arciprete, EMC, West Brandywine Township		
	Jon Altshul, Township Manager, Westtown Township		
	Don Verdiani, EMC, Westtown Township		
	Martin McKenzie, EMC, Willistown Township		
Meredith Mayer Braine, Associate Planner, Brandywine Conservancy			
Chris O'Neill, Chief, Goshen Fire Company			



MEETING NOTES

Gary Weigel, EMS Chief, Goshen Fire Company
Matthew Eick, EMS Captain, Longwood Fire Company
Paul DeCarlo, Fire Chief, Glen Moore Fire Company
Rik Thornton, Public Safety Supervisor, West Chester Area School District
One additional, unidentified attendee
Tony Subbio, Tetra Tech

Discussion Points

The sections below summarize each discussion point addressed during the meeting.

Welcome

Ms. Ratliff welcomed attendees. Mr. Subbio described the purpose of the meeting.

Review the Planning Process

Mr. Subbio reviewed the project timeline. He described the meetings that were conducted and the 138 organizations that participated in the planning process.

Review the Document

Mr. Subbio gave a brief summary of each section of the updated HMP, as described below:

- Section 1: Introduction provides the background, purpose, and scope of the HMP.
- Section 2: County Profile discusses the nature of Chester County, its communities, and its environment. It also discusses the limitations of data used in developing the HMP.
- Section 3: Planning Process summarizes the process by which the HMP was updated. It identifies the municipalities and stakeholders that participated in the planning process.
- Section 4: Risk Assessment includes the hazard profiles and vulnerability summary.
- Section 5: Capability Assessment describes the plans, regulations, staff, and resources available to implement hazard mitigation throughout the County. Mr. Subbio described the capabilities that were analyzed.
- Section 6: Mitigation Strategy includes the goals, objectives, and mitigation actions identified in the planning process. Mr. Subbio described the process used to develop mitigation actions, including using information gathered from worksheets, surveys, planning meetings, and contact with municipal officials.
- Section 7: Plan Maintenance describes how the HMP will be maintained over 5 years after adoption, including the annual review process.
- Section 8: Plan Adoption includes template resolutions for each participating jurisdiction to adopt the HMP.
- The appendices include documentation of the planning process. Appendix I lists the critical facilities analyzed in the risk assessment; this appendix is not available to the public for security reasons.



MEETING NOTES

Mr. Verdiani asked if there was time to make changes to the actions in the plan. Mr. Subbio replied that the project schedule does not allow changes at the present time, but that changes can be made to the plan after it is approved by FEMA.

Next Steps

Mr. Subbio reviewed the following next steps in the HMP update process with attendees:

- Tetra Tech will put the finishing touches on the draft HMP by April 9, 2021.
- Tetra Tech will submit the HMP to Pennsylvania Emergency Management Agency (PEMA) for review on or about April 12, 2021.
- After PEMA completes its review, Tetra Tech will make any required changes and submit the plan to the Federal Emergency Management Agency (FEMA) for formal review; submission is estimated to be in mid-April 2021.

With no further questions, Ms. Ratliff, Mr. Turner, and Mr. Subbio thanked attendees for their time and participation. The meeting concluded at 7:15 p.m.



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**Chester County
Hazard Mitigation Plan (HMP)
Update
Plan Draft Review Meeting**

1

Welcome

- If you are attending the webinar on your computer, please add your name, title, and organization(s) to the Chat.
 - Bring your mouse to the lower part of the screen until a set of buttons appears. They might also be at the top-right of your screen.
 - Click “Show Conversation.”

2

Agenda

- Welcome
- Review the Planning Process
- Review the Document
- Next Steps
- Questions

3

Review the Planning Process

- Planning Team Kickoff Meetings
 - March 13, 2020
- Risk Assessment Update
 - March 13 – October 30, 2020
 - Risk Assessment Review Meetings: November 9, 2020
- Mitigation Strategy Update
 - March 13, 2020 – February 26, 2021
 - Mitigation Strategy Workshop: December 9, 2020
- Develop the HMP Document
 - February 6, 2020 – March 7, 2021
- Public Review Period
 - March 7 – April 7, 2021

4

Review the Planning Process

Chester County Department of Community Development	Chester County Department of Human Services	Chester County Health Department	Chester County Prison	Chester County Water Resources Authority
Chester County Department of Emergency Services	Chester County Detectives	Chester County Planning Commission		
All 73 Municipalities				
Commonwealth of Pennsylvania				
Pennsylvania Department of Environmental Protection				
Emergency Services Organizations				
Avondale Fire Company	East Pikeland Township Police Department	Longwood Fire Company	Tredyffrin Township Police Department	West Chester Borough Police Department
Chester County Fire Police Association	Goshen Fire Company	Minquas Fire Company	Urichlan Township Police Department	West End Fire Company
Downingtown Police Department	Kennett Fire Company	Owen J Roberts School Police	West Brandywine Township Police	Willistown Township Police
East Coventry Township Police Department				

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Review the Planning Process

Healthcare				
AFC Urgent Care	Brookdale	Children's Behavioral Health Services, Devereux	Holisticare Hospice	Tel Hai Personal Care
Brandywine Hospital - Tower Health	Camilla Hall Nursing Home	Harrison Senior Living	Park Lane at Bellingham Skilled Nursing Facility	There's No Place Like Home (TNPLH) Home Care
Brandywine River Valley Home Health	Chester County Hospital	Hickory House	Pocpsom Home	
Education				
Avon Grove School District	Oxford Area School District	Pope John Paul II Regional Catholic Elementary School	Saint Patrick School	Villa Maria Academy High School
Bishop Shanahan High School	Phoenixville School District	Renaissance Charter Academy	Tredyffrin/ Easttown School District	West Chester Area School District
Downingtown Area School District				

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Review the Planning Process

Community Groups				
Agency and Community Partnerships	Downingtown Municipal Water Authority	Oxford Area Sewer Authority	Trout Unlimited Valley Forge	United Way of Chester County
Brandywine Conservancy and Museum of Art	Octorara Watershed Association			
Other Stakeholders				
Aqua Water	Krapf Transportation	Parzival	Vanguard	West Pharmaceutical Services
CHESCOBUS	Longwood Gardens	Region 3 Amtrak		



7

Review the Document

- Section 1: Introduction
 - Background
 - Purpose
 - Scope
- Section 2: County Profile
 - Geography and Environment
 - Community Facts
 - Population and Demographics
 - Land Use and Development
 - Data Sources and Limitations



8

Review the Document

- Section 3: Planning Process
 - Update Process and Participation Summary
 - The Planning Team
 - Meetings and Documentation
 - Public and Stakeholder Participation
 - Multi-Jurisdictional Planning



9

Review the Document

- Section 4: Risk Assessment
 - Update Process Summary
 - Hazard Identification
 - Hazard Profiles
 - Hazard Vulnerability Summary

HAZARD	HAZARD	RISK ASSESSMENT					RISK RATING
		PROBABILITY	IMPACT	SPECIAL EFFECTS	RECURRING	REVERSIBLE	
HAZARD	Water Intoxication	4	3	4	4	2	12
	Food Poisoning	4	4	3	3	3	12
	Lead Acid Batteries	4	4	3	4	1	12
	Hydrogen Peroxide	2	4	2	3	4	12
	Chlorine Gas	3	3	4	4	1	12
	Flammable Liquids	4	3	3	4	2	12
	Flammable Solids	4	3	3	4	2	12
	Explosive Systems	4	3	4	3	4	12
	Explosives	4	3	3	4	3	12
	Environmental Hazards	3	3	4	3	3	12
HAZARD	Asbestos	4	3	3	4	3	12
	Lead	4	3	3	4	3	12
	Radon	4	3	3	4	3	12
	Lead Acid Batteries	3	3	4	3	4	12
	Explosives	4	3	3	4	3	12
	Explosive Systems	3	3	3	3	4	12
	Explosives	3	3	4	4	3	12
	Explosives	2	3	4	3	3	12
	Explosives	4	3	3	4	3	12
	Explosives	3	3	4	3	3	12
HAZARD	Explosives	3	3	3	4	3	12
	Explosives	1	2	2	4	2	12
	Explosives	1	1	1	3	2	12



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Review the Document

- Section 5: Capability Assessment
 - Comprehensive Planning
 - Emergency Management
 - Participation in the NFIP
 - Community Rating System (CRS)
 - Administrative and Technical Capability
 - Political Capability
 - Financial Capability
 - Education and Outreach
 - Self-Assessment
 - Plan Integration



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Review the Document

- Section 6: Mitigation Strategy
 - Update Process Summary
 - Mitigation Goals and Objectives
 - Identification and Analysis of Mitigation Techniques
 - Mitigation Action Plan

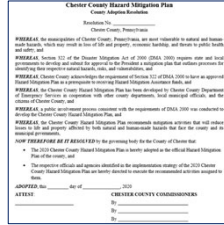


12



Review the Document

- Section 7: Plan Maintenance Procedures
 - Monitoring, Evaluating, and Updating the Plan
 - Information Requests
 - Worksheets
 - Annual Review Meeting
 - Continued Public Involvement
- Section 8: Plan Adoption



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Review the Document

- Appendices
 - Authorities and References
 - Local Plan Review Crosswalk
 - Meeting Documentation
 - Municipal Participation Documentation
 - Public and Stakeholder Participation
 - Adoption Resolutions
 - Blank Mitigation Action Worksheet
 - Completed Mitigation Action Worksheets
 - Critical Facilities (not publicly available)



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Next Steps

- Finishing touches
 - April 8-9, 2021
- Submission to PEMA
 - On or about April 12, 2021
- Submission to FEMA Region III
 - On or about April 21, 2021



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Questions?

Thank you for your time!



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Contacts



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 gratliff@chesco.org
 (610) 344-5042



Tony Subbio
 tony.subbio@tetrattech.com
 (717) 839-5654



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AGENDA

CHESTER COUNTY HAZARD MITIGATION PLAN UPDATE Plan Draft Review Meeting

Wednesday, April 7, 2021 | 6:00 – 8:00 p.m.

-
1. Welcome
 2. Review the Planning Process
 3. Review the Document
 4. Next Steps
 5. Questions
-



Capability Assessment Survey

Jurisdiction: Chester County Point of Contact Name and Title: ___ Gabby Ratliff, Community Resilience Coordinator

Phone: 484.402.3429 E-mail: gratliff@chesco.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	Dec, 2015			
Emergency Operations Plan	X				
Disaster Recovery Plan			X		
Evacuation Plan	X				
Continuity of Operations Plan	X				
NFIP	X				
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	N/A				All municipalities have a Zoning Ordinance



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	N/A				All municipalities have SALDO ordinances
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X				Landscapes 3, Comprehensive Plan
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	x		x	Water Resources Authority	Act 167 Plan for County
Natural Resource Protection Plan					
Capital Improvement Plan	X				
Economic Development Plan	X				Landscapes 3
Historic Preservation Plan	X				Landscapes 3
Farmland Preservation	X				Landscapes 3
Building Code					
Fire Code	X				
Other	X				Climate Action Plan (in draft form)

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Planning Commission, Water Resources Authority	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Water Resources Authority	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	x		Facilities, Risk Management	
Emergency Manager	X		Emergency Services	
NFIP Floodplain Administrator	X			
Land Surveyors				
Scientists or staff familiar with the hazards of the community	X			
Personnel skilled in GIS and/or FEMA’s HAZUS program	X			
Grant writers or fiscal staff to handle large or complex grants	X		Community Development	
Staff with expertise or training in benefit-cost analysis				
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	x			
Community Development Block Grants (CDBG)	x			
Special Purpose Taxes	x			
Gas / Electric Utility Fees	N/A			Private
Water / Sewer Fees	N/A			Private/Municipal
Stormwater Utility Fees	N/A			
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs	x		Emergency Services	Stop the bleed, Safe Schools Coordinator
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	x		Emergency Services Water Resources Authority Ag Extension (Environmental Education)	
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	x		Emergency Services	Southeastern PA Regional Taskforce has subcommittees focused on these initiatives.
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach			X

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County		X	X			
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones		X	X			
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		
AH-4. Provide regular updates to the countywide Mass Care Plan				X		
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County		X				
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community				X		
AH-7. Promote and provide emergency management training opportunities		X	X			Capability
AH-8. Arrange and hold hazard mitigation workshops for county residents	X	X	X			Capability
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division		X				Capability
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters		X	X			Capability
AH-11. Enhance the communications equipment between the County and the municipalities		X	X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery			X			
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			x			
AH-15. Implement a system to report blocked/closed roads				X		
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures			x			
AH-18. Promote awareness of mental health services and resources throughout all the facilities within the County to include schools, workplaces, and healthcare facilities			x			
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders			x			CISM and DCORT in place
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines			x			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables	X					
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events		X				
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains		X				
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads		X				
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps		X	X			
F-6. Follow state and County stormwater regulations		X				
F-7. Enforce floodplain management ordinances						
F-8. Implement the Act 167 Plan (Stormwater management)		X				
F-9. Manage integrity and functions of existing regional flood control facilities		X				
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams		X				
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-12. Continue to maintain the stream gauges						
F-13. Continue to maintain the stream gauges within the County			x			
F-14. Install stream gauges if an additional area is identified to benefit from one			X			
F-15. Provide education to the municipalities on flood gauges	X					
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate		X				FEMA completed remapping in 2017 of Brandywine-Christina Watershed
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	x					
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education		X				
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	X					
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-1. Provide public information on utility outages and the need to prepare for storms			x			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents		x				
WS-3. Improve storm drains throughout the County to handle snow melt	x					
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	x					
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency		x				
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	x					
TOR-2. Develop a countywide Debris Management Plan		x				
TOR-3. Provide public information on debris management		x				
TOR-4. Retrofit critical public facilities with safe rooms	x					
D-1. Provide public information on the effects of droughts on public and private wells			x			
D-2. Promote sustainability programs and green practices throughout the County			x			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs			x	x		
PG-1. Encourage security check of bags/coolers at public gathering			x			
PG-2. Plan for and implement strengthened security at public events			x			
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events				x		
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation		x				
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	x					Unknown
PG-6. Purchase temporary mobile camera to set up for events				x		
PG-7. Utilize temporary mobile camera during large events to monitor safety and security			x			
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	x					
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			x			Attorney part unknown
PG-10. Increase advanced planning through use of the incident action plan process			x			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	x					
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage		x				
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			x			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)		x				
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages		x				
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster		x				
TRF-7. Provide public education on traffic accident reduction		x				
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			x			
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			x			
TRF-10. Enforcement of traffic laws			x			
IL-1. Provide private sector education/outreach related to cyber security best practices			x			
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers				x		



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-3. Purchase backup generators for critical infrastructure/key resources		x				
IL-4. Plan for replenishment fuel for generators	x					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site		x				
IL-6. Continue to engage the private sector to become involved in emergency preparedness		x				
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	x					

Mitigation Action Worksheet

Municipality(ies):	Action
All 73 Chester County municipalities	Update County-wide Model Stormwater Ordinance
Action Number:	
<i>Location (address, lat/long)</i>	n/a
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Flooding
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	\$70,000
<i>Potential Funding Streams</i>	Chester County Commissioners
<i>Timeline</i>	Short; Start in 2021 and completed by 2022
<i>Lead Agency/Department</i>	Chester County Water Resources Authority
<i>Support Agency(ies)/ Department(s)</i>	Chester County Planning Commission and Chester County Conservation District
Project Point of Contact	
<i>Name</i>	Cory Trego
<i>Title</i>	Water Resources Planner
<i>Agency/Department</i>	Chester County Water Resources Authority
<i>Phone</i>	610-344-5400
<i>E-mail</i>	ctrego@chesco.org

Municipality: Atglen Borough

Name of Representative from Municipality: Geoffrey Burkarte

Date: 10/16/2020

Time: 8:45 am

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No changes, same areas of concern with flooding.

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Talked to state and took care of SR 41/Green Street area

Truck traffic through the Borough/Chicken trucks

SW of 41- Whitehorse Road prone, creek is prone to flooding due to debris – may be a problem because of PennDOT inlets being clogged.

3. Go through their specific mitigation actions to see if there are completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Ongoing for EAS and public information.

Everything else there was no progress on but flooding areas still problems.

4. Planning Updates (EOPs, SALDO, Zoning, NFIP, etc.)?

Nothing new, borough maintains these planning capabilities routinely.

EOP-

SALDO-

Zoning-

NFIP Ordinance-

Building Codes-

Comp plan- 2015

Birmingham Township:

Mike Hoccaus, Birmingham Township 1/21/21 at 9 am.

Hazards:

Flooding has improved with bridge replacement at 926 and Creek Rd.

Other hazards consistent with 2015 (Winter Storms, wind, etc.).

Capabilities:

No change, sewer transition to privately operated (in process, not approved by board yet).

Mitigation Actions:

Masters Way Build access road to Webb Rd Inaccessible during floods- no change

Street Road (PA 926) bridge over Brandywine Creek Reengineer intersection Intersection easily floods cutting of all traffic Street Road (PA 926) at Creek Rd

Hazard Identification and Risk Evaluation Worksheet

Name: Raymond Stackhouse Title: EMC

Jurisdiction: Caln Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	D	LESS WINTER WEATHER
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Caln Township Point of Contact Name and Title: Raymond Stackhouse, EMC

Phone: 610.384.0600 x157 E-mail: rstackhouse@calntownship.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X				
Emergency Operations Plan	X				
Disaster Recovery Plan			X		
Evacuation Plan			X		
Continuity of Operations Plan			X		
NFIP	X				
NFIP – Community Rating System	X				
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X				
Floodplain Management Plan			X		
Zoning Regulations	X				



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X				
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X				
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan					
Capital Improvement Plan	X				
Economic Development Plan					
Historic Preservation Plan	X				
Farmland Preservation					
Building Code	X				
Fire Code	X				
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Twp Building & Life Safety	Consultants used as needed
Planners or engineers (with natural and/or human caused hazards knowledge)	X		ARRO Engineering	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		BIU/Twp Building & Life Safety	
Emergency Manager	X		Twp Building & Life Safety	
NFIP Floodplain Administrator	X		Twp Building & Life Safety	Consultants used as needed
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program	X		ARRO Engineering	
Grant writers or fiscal staff to handle large or complex grants	X		ARRO Engineering/Twp Staff	
Staff with expertise or training in benefit-cost analysis	X		Twp Manager	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Twp Finance Dept.	
Community Development Block Grants (CDBG)	X		ARRO/Twp Staff	
Special Purpose Taxes	X		Twp Building & Life Safety	Fire Tax
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Wastewater Dept.	
Stormwater Utility Fees		X		
Development Impact Fees	X		Twp Building & Life Safety	
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements		X		
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		Twp Building & Life Safety	
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Raymond Stackhouse **Title:** EMC **Jurisdiction:** Caln Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County		X				<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-4. Provide regular updates to the countywide Mass Care Plan		X				<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			Has this activity been integrated into the municipality's normal operations?
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events			X			Has this activity been integrated into the municipality's normal operations?
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities			X			Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			X			Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering		X				<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure		X				Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages		X				Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-7. Provide public education on traffic accident reduction			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						

<i>Existing Mitigation Action</i>	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



Mitigation Action Plan Review Worksheet- Caln Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Caln Township			X			
Emergency alerting systems for Caln Township			X			
Acquire/Elevate structure at 135 Seltzer Road	X					

Mitigation Action Plan Review Worksheet- City of Coatesville

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public information programs for the City of Coatesville		X				
Emergency alerting systems for the City of Coatesville	X					
Property protection for the structure at 63 South Fifth Avenue				X		
Upgrade generator at City Hall and EOC (1 City Hall PI)	X					
Install generator at the West End Fire Company (134 Strode Avenue)	X					
Pre-plan access roads throughout the City			X			
Install gates to be closed during flood incidents and signage at 11 th Avenue and railroad underpass	X					
Develop plan to deploy traffic light generators throughout the city			X			
Replace Gibbons Run Culvert	X					

Municipality: City of Coatesville

Name of Representative from Municipality: Chief Garry Aldernman

Date: 10/20/2020

Time: 10:00am

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No increase in these items.

No changes

Demonstrations- civil disturbance over the summer of 2020.

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

No change, same areas Rt 82 and Lincoln highway which is under construction

Tunnel flooding (mostly in Caln)

3. Go through their specific mitigation actions to see if there are completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall. See sheet

4. Planning Updates (EOPs, SALDO, Zoning, NFIP, etc.)?

GIS is contracted, capital improvement plan in place, otherwise no changes but plans and ordinances are routinely reviewed.

EOP-

SALDO- Y

Zoning- Yes

NFIP Ordinance-

Building Codes-

Municipality: Downingtown Borough

Name of Representative from Municipality: Chief Holland

Date: 10/15/2020

Time: 2:41pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

Increase with civil unrest over the summer of 2020 otherwise no changes

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

List is consistent with identified areas in the 2015 plan

3. Go through their specific mitigation actions to see if there are completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

No significant changes

4. Planning Updates (EOPs, SALDO, Zoning, NFIP, etc.)?

Plans are pretty much kept up to date. Engineer on staff. Radon requirements. Downingtown does have water authority.

EOP- Yes

SALDO- Yes

Zoning- Yes

NFIP Ordinance-

Building Codes-

Hazard Identification and Risk Evaluation Worksheet

Name: Mandie Cantlin

Title: Township Manager

Jurisdiction: East Bradford Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	I	Based on feedback from professionals
Earthquake	NC	
Extreme Temperatures	I	Based on feedback from professionals
Flood, Flash Flood, and Ice Jam	I	Based on feedback from professionals
Hurricane and Tropical Storm	I	Based on feedback from professionals
Radon Exposure	NC	
Thunderstorm	I	Based on feedback from professionals
Tornado and Windstorm	I	Based on feedback from professionals
Winter Storm	D	Based on feedback from professionals
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	I	Based on feedback from professionals
Dam Breaches	I	Based on feedback from professionals



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	Based on feedback from professionals
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	Based on feedback from professionals

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input checked="" type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input checked="" type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input checked="" type="checkbox"/> Terrorism |
| <input checked="" type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _____

Point of Contact Name and Title: _____

Phone: _____

E-mail: _____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					No
Emergency Operations Plan	X	TBD		EMC	
Disaster Recovery Plan					No
Evacuation Plan					No
Continuity of Operations Plan					No
NFIP	X	2017		Zoning	
NFIP – Community Rating System	X	2017		Zoning	
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	2017		Zoning	
Floodplain Management Plan	X	2017		Zoning	
Zoning Regulations	X	2020		Various	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	2020		Various	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2016		Various	
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	2009		Various	
Stormwater Management Plan / Ordinance	X	2020		Various	
Natural Resource Protection Plan	X	UK		Various	
Capital Improvement Plan	X	2020		Various	
Economic Development Plan					
Historic Preservation Plan	X				In the Zoning Ordinance
Farmland Preservation					
Building Code	X	Unknown		BCO	UCC
Fire Code	X	2020		BCO/Fire Marshall	
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Zoning	
Planners or engineers (with natural and/or human caused hazards knowledge)	X			
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Building Code Official	
Emergency Manager		X		EMC = volunteer
NFIP Floodplain Administrator	X		Zoning	
Land Surveyors	X		Engineering	
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program	X			
Grant writers or fiscal staff to handle large or complex grants	X			
Staff with expertise or training in benefit-cost analysis	X			
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST BRADFORD

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	Available on line
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	Available at the Township Building
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	By ordinance and review/approval or submission to FEMA
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	No data has been presented to date, other than proposed LOMA or LOMA by applicants
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	Has not been requested
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Zoning office. Included in property files.



2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Zoning office. If requirements are met.
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Zoning office.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Zoning office. Per ordinance.
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Zoning/Building offices. Per ordinance.
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Via zoning enforcement by the Zoning Officer. Per enforcement procedures.

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes (all)	Via plan and occupancy permit review. Per ordinance.

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	Grant preparation when requested.

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
No feedback		
Goal 2	Reduce personal and property disaster losses	
No feedback		
Goal 3	Increase disaster resilience of public and private infrastructure	
No feedback		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
No feedback		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
No feedback		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
No feedback		



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						N/A
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			
AH-4. Provide regular updates to the countywide Mass Care Plan						N/A
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						N/A
AH-7. Promote and provide emergency management training opportunities			X			
AH-8. Arrange and hold hazard mitigation workshops for county residents						N/A
AH-9. Maintain and foster communications with PEMA ad FEMA region III-Mitigation Division			X			
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			
AH-11. Enhance the communications equipment between the County and the municipalities			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						N/A
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads						N/A
FC-16. Provide education to the municipalities on resident evacuation processes and need						N/A
AH-17. Provide education to the municipalities on tracking road closures						N/A
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						N/A
AH-20. Provide public information surrounding Radon hazard			X			
AH-21. Encourage municipalities to require radon testing at the time sale of homes						N/A
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						N/A

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						N/A
F-2. Educate county residents on the NFIP following flood events	X					
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						N/A
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			
F-8. Implement the Act 167 Plan (Stormwater management)			X			
F-9. Manage integrity and functions of existing regional flood control facilities			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						N/A
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						N/A
F-12. Continue to maintain the stream gauges						N/A
F-13. Continue to maintain the stream gauges within the County						N/A
F-14. Install stream gauges if an additional area is identified to benefit from one						N/A
F-15. Provide education to the municipalities on flood gauges						N/A
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						N/A
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						N/A
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						N/A

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired			X			
WS-1. Provide public information on utility outages and the need to prepare for storms						N/A
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						N/A
WS-3. Improve storm drains throughout the County to handle snow melt						N/A
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						N/A
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris						N/A
TOR-2. Develop a countywide Debris Management Plan						N/A

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-3. Provide public information on debris management			X			
TOR-4. Retrofit critical public facilities with safe rooms	X					
D-1. Provide public information on the effects of droughts on public and private wells	X					
D-2. Promote sustainability programs and green practices throughout the County						N/A
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					
PG-1. Encourage security check of bags/coolers at public gathering	X					
PG-2. Plan for and implement strengthened security at public events	X					
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						N/A

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						N/A
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						N/A
PG-6. Purchase temporary mobile camera to set up for events	X					
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	X					
PG-10. Increase advanced planning through use of the incident action plan process	X					
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure						N/A



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)		X				
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						N/A
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						N/A
TRF-7. Provide public education on traffic accident reduction			X			
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources		X				
IL-4. Plan for replenishment fuel for generators						N/A
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						N/A
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						N/A

Mitigation Action Plan Review Worksheet- East Bradford Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for East Bradford Township	X					
Emergency alerting systems for East Bradford Township				X		Utilize the County reverse 911 system
Acquisition/Elevation of structure located at 402 Cottage Lane	X					
Acquisition/Elevation of structure located at 406 Cottage Lane	X					
Acquisition/Elevation of structure located at 414 Cottage Lane	X					
Acquisition/Elevation of structure located at 418 Cottage Lane	X					
Acquisition/Elevation of structure located at 426 Cottage Lane		X				A permit was issued to elevate but was not finalized
Acquisition/Elevation of structure located at 502 River Bend Lane	X					
Acquisition/Elevation of structure located at 522 River Bend Lane					X	No record of this address
Acquisition/Elevation of structure located at 526 River Bend Lane				X		Demolished 2016
Acquisition/Elevation of structure located at 530 River Bend Lane	X					
Acquisition/Elevation of structure located at 550 River Bend Lane	X					
Acquisition/Elevation of structure located at 558 River Bend Lane	X					

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Acquisition/Elevation of structure located at 690 North Creek Road				X		Demolished in 2007
Property Protection of the structure located at 1010 Valley Creek Road	X					
Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way	X					
Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road	X					
Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road	X					
Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road	X					
Install battery back-up and/or generator hookup on traffic signal on Downingtown Pike and Bradford Plaza				X		
Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Nields Street	X					
Acquire 4-wheel vehicle to support response in limited access Harmony Hill Natural Area				X		

Capability Assessment Survey

Jurisdiction East Brandywine Township

Point of Contact Name and Title: Scott Piersol, Manager

Phone: (610) 269-8230 x 203 (O) (610) 842-1446 (C) E-mail: scottpiersol@ebrandywine.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	x	2015		EB Twp & County EMA	
Emergency Operations Plan	x	3/2012		EB Township	Part of EAP, Reviewed annually
Disaster Recovery Plan			x	County EMA	Received guidelines from County EMA
Evacuation Plan	x	3/2012		EB Township	Part of EAP, Reviewed annually
Continuity of Operations Plan			x	EB Township	Received guidelines from County EMA
NFIP	x	2017		FEMA/PEMA	
NFIP – Community Rating System	x	2017		FEMA/PEMA	
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	x	8/2017		EB Township	Zoning Chapter, § 399-13 Flood Hazard District
Floodplain Management Plan	x	8/2017		EB Township	Zoning Chapter, § 399-13 Flood Hazard District

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Zoning Regulations	x	1970 & 2019		EB Township	Zoning regulations reviewed & updated continually
Subdivision Regulations	x	1970 & 2019		EB Township	Zoning regulations reviewed & updated continually
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	x	2009	2022	EB Township	Application to be submitted to County VPP grant program September, 2020
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	2009	2022	EB Township	Application to be submitted to County VPP grant program September, 2020
Stormwater Management Plan / Ordinance	x	2014		EB Township	Chapter 345 - Township Land Use Code
Natural Resource Protection Plan	x	2019		EB Township	Zoning Chapter, Article IV Natural Features Protection Standards
Capital Improvement Plan	x	2020		EB Township	Part of Annual Budget
Economic Development Plan					
Historic Preservation Plan	x	2007, updates thru 2019		EB Township	Zoning Chapter - Article XII – Historic Resource Protection Standards
Farmland Preservation	x			Chester County	
Building Code	x	4/2002		EB Township	Uniform Construction Code – Act 45 of 1999
Fire Code	x	4/2002		EB Township	Uniform Construction Code – Act 45 of 1999

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	x		Township Engineer - Pennoni	
Planners or engineers (with natural and/or human caused hazards knowledge)	x		Township Engineers – Pennoni & Cedarville Engineering Group	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	x		Township Engineers – Pennoni & Cedarville Engineering Group	
Emergency Manager	x		Township staff	
NFIP Floodplain Administrator	x		Township Zoning Officer	
Land Surveyors	x		Would use Twp Engineer	
Scientists or staff familiar with the hazards of the community	x		Township staff	
Personnel skilled in GIS and/or FEMA’s HAZUS program	x		Township staff	
Grant writers or fiscal staff to handle large or complex grants		x		
Staff with expertise or training in benefit-cost analysis		x		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	x		EB Township staff	
Community Development Block Grants (CDBG)	x		EB Township staff	
Special Purpose Taxes	x		EB Township staff	Fire Services Tax, EIT Open Space
Gas / Electric Utility Fees		x	PECO	PECO
Water / Sewer Fees	x		EBT Municipal Authority	Sewer fees for EBTMA users
Stormwater Utility Fees		x		Not at present time; considering
Development Impact Fees	x		EB Township staff	
General Obligation, Revenue, and/or Special Tax Bonds	x		EB Township staff with assistance from bond counsel & broker	
Partnering Arrangements or Intergovernmental Agreements	x		IGAs for equipment sharing, police services	
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification	x		Township Building Inspectors	Additional informaiton needed
StormReady certification		x		Additional informaiton needed
Natural disaster or safety related school programs	x		School Districts & County	
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	x		Township website & newsletter, East Brandywine Fire Co. fire safety presentations	
Public-private partnership initiatives addressing disaster-related issues		x		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		x		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		x	
Administrative and Technical Capability		x	
Financial Capability		x	
Education and Outreach		x	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: East Brandywine Township

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	Digital and paper copies available at Township Office, and online at FEMA Flood Map Service Center
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	Ordinance 02 of 2017
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	Our Township Engineer evaluates the request submitted by the applicant's engineering firm, and signs the Community Acknowledgement form
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	This is typically done by the applicant, or developer.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	East Brandywine Township Office. We have files for these LOMAs.+

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	East Brandywine Township Zoning/Floodplain Administrator
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	East Brandywine Township Engineer, currently Pennoni
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	East Brandywine Township Building Code Officials, with assistance from Township Engineer, when needed
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	East Brandywine Township Property files (paper and electronic)
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Permits are required in accordance with our Flood Hazard District regulations

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	All 5 listed activities are prohibited by § 399-13 Flood Hazard District

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.		Article in our newsletter, the Mile Marker
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	We would do so by letter if we were notified of a change
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Scott Piersol **Title:** Manager **Jurisdiction:** East Brandywine Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
<p><i>All of these are general goals that should continue to be implemented as necessary in each respective community, based on the hazards within the community.</i></p>		
Goal 2	Reduce personal and property disaster losses	
<p></p>		
Goal 3	Increase disaster resilience of public and private infrastructure	
<p></p>		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones			X			
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			
AH-4. Provide regular updates to the countywide Mass Care Plan			X			
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			
AH-8. Arrange and hold hazard mitigation workshops for county residents			X			
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			
AH-11. Enhance the communications equipment between the County and the municipalities			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery			X			
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads			X			
FC-16. Provide education to the municipalities on resident evacuation processes and need			X			
AH-17. Provide education to the municipalities on tracking road closures			X			
AH-18. Promote awareness of mental health services and resources throughout all the facilities within the County to include schools, workplaces, and healthcare facilities			X			
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders			X			
AH-20. Provide public information surrounding Radon hazard			X			
AH-21. Encourage municipalities to require radon testing at the time sale of homes			X			
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines			X			
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County			X			
F-2. Educate county residents on the NFIP following flood events			X			
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			
F-8. Implement the Act 167 Plan (Stormwater management)			X			
F-9. Manage integrity and functions of existing regional flood control facilities			X			
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams			X			
F-11. Develop and implement a model natural conservation ordinance for municipal adoption			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-12. Continue to maintain the stream gauges			X			
F-13. Continue to maintain the stream gauges within the County			X			
F-14. Install stream gauges if an additional area is identified to benefit from one			X			
F-15. Provide education to the municipalities on flood gauges			X			
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water			X			
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate			X			
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs			X			
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education			X			
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows			X			
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-1. Provide public information on utility outages and the need to prepare for storms			X			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X			
WS-3. Improve storm drains throughout the County to handle snow melt	X					PennDOT
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					PennDOT
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			X			
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			
TOR-2. Develop a countywide Debris Management Plan		X				
TOR-3. Provide public information on debris management		X				
TOR-4. Retrofit critical public facilities with safe rooms	X					
D-1. Provide public information on the effects of droughts on public and private wells			X			
D-2. Promote sustainability programs and green practices throughout the County	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs			X			
PG-1. Encourage security check of bags/coolers at public gathering			X			
PG-2. Plan for and implement strengthened security at public events			X			
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events			X			
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation			X			
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens			X			
PG-6. Purchase temporary mobile camera to set up for events	X					
PG-7. Utilize temporary mobile camera during large events to monitor safety and security			X			
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			X			
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			Attorneys??
PG-10. Increase advanced planning through use of the incident action plan process			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure			X			
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		Each traffic signal has LEDs, battery backup and plugs for portable generator
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages			X			
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster			X			
TRF-7. Provide public education on traffic accident reduction			X			
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			X			
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices			X			
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers				X		

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-3. Purchase backup generators for critical infrastructure/key resources				X		EB Twp CI all have emergency generators
IL-4. Plan for replenishment fuel for generators			X			EB Twp has a fuel depot and truck-mounted fuel tank
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site			X			
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts			X			

Mitigation Action Plan Review Worksheet- East Brandywine Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for East Brandywine Township			x			Newsletter & website
Emergency alerting systems for East Brandywine Township			x			
Install generator connection at East Brandywine Baptist Church (999 Horseshoe Pike)	x					Funding
Install generator connection at Hopewell United Methodist Church (852 Hopewell Road)	x					Funding
Increase size of culvert crossing at 2069 Bondsville Road	x					Private property
Flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road	x					Private property-funding, no report of damages 8/4/2020
Acquire/Elevate structure at 785 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Acquire/Elevate structure at 775 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Acquire/Elevate structure at 765 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Acquire/Elevate structure at 755 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Acquire/Elevate structure at 745 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Property protection of structure located at 1081 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Property protection of structure located at 1061 Creek Road	x					Private property-funding, no report of damages 8/4/2020

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Property protection of structure located at 1051 Creek Road	x					Private property-funding, no report of damages 8/4/2020
Construct larger culvert at 200 block Zynn Road				2019		

Mitigation Action Worksheet

Municipality(ies):	Action
East Brandywine Twp	Beaver Creek Dam Rehabilitation Project
Action Number:	
<i>Location (address, lat/long)</i>	n/a
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	\$4,500,000
<i>Potential Funding Streams</i>	USDA Natural Resources Conservation Service, and Chester County Commissioners
<i>Timeline</i>	On-going program, Completed in 2021 or 2022
<i>Lead Agency/Department</i>	Chester County Water Resources Authority
<i>Support Agency(ies)/ Department(s)</i>	USDA Natural Resources Conservation Service
Project Point of Contact	
<i>Name</i>	Craig Thomas
<i>Title</i>	Field Engineering and Operations Manager
<i>Agency/Department</i>	Chester County Water Resources Authority
<i>Phone</i>	610-344-5400
<i>E-mail</i>	cthomas@chesco.org

Municipality: East Coventry Township

Name of Representative from Municipality: David G. Krayocik Township Manager

Date: 23-Oct-20

Time: 1115 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

None

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

None

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Yes

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- None

NFIP Ordinance- None

Building Codes- Yes

GIS Technology-County

Water Sewer Authority- None

Capital Improvement Plans- Include in Township Budget

Building Code- Township Employee

Engineer- Third Party Contract

Planning Commission- Yes

Stormwater Management Ordinance / M/SR 4 Plan - Yes Up to date

East Fallowfield

Tony Sirna- 1/21/21, around 12:30

Hazards-

Power outages more active than flooding, there

Capabilities-

Increase in development (residential).

No changes

Mitigation Actions

Intersection of Mortonville Rd and Sawmill Rd Improve drainage to reduce flooding- Grants for repairs to S sawmill

Mortonville Rd Improve drainage to reduce flooding

Timacula Rd Improve drainage to reduce flooding

475 Doe Run Rd East Fallowfield, PA 19320- Install a backup generator- **completed**

Hazard Identification and Risk Evaluation Worksheet

Name: _Rick Smith_____ Title: Township Manager _____

Jurisdiction: East Goshen Township _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures		
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Dam Breaches	D	<p>We have 2 dams. We have a permit from PA DEP to breach the Hershey Mill Dam. The project is expected to occur in 2020.</p> <p>The Milltown Reservoir Dam is classified as a high hazard dam by PA DEP. The Township has submitted an application to lower the dam and reduces its hazard classifications. The project is expected to occur in 2021.</p>
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	<p>Sunoco has installed a 16 inch NGL pipeline through the Township. The pipe was just placed in services. Sunoco is currently working on the installation of a 20 inch NGL pipeline. Not sure when it will be placed in service. Adelphia plans to reactivate an existing Interstate Energy oil pipeline and use it to transport natural gas.</p>

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: East Goshen Township _____

Point of Contact Name and Title: Rick Smith, Township Manager

Phone: 610 692 7171 _____

E-mail: rsmith@eastgoshen.org _____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	12/3/14		Chester County	
Emergency Operations Plan	X	3/24/14			
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	6/9/97 Updated 7/11.17		Board of Supervisors	
Floodplain Management Plan					



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Zoning Regulations	X	6/9/97		Board of Supervisors	The Zoning Ordinance has been updated numerous times since its adoption in 1997, the most recent being in 2017.
Subdivision Regulations	X	7/1/97		Board of Supervisors	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	10/20/15			
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	10/20/15		Board of Supervisors	
Stormwater Management Plan / Ordinance	X	11/19/13		Board of Supervisors	Adopted County's Model Ordinance
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	X	5/4/04		Board of Supervisors	Under our ordinance updates to the Building Code are automatically incorporated when approved the UCC Review and Advisory Council
Fire Code	X	5/4/04		Board of Supervisors	Under our ordinance updates to the Fire Code are automatically incorporated when

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
					approved the UCC Review and Advisory Council
Other					
Hershey Mill Dam (D15-125) EAP	X	4/3/09		Board of Supervisors	Township has a permit from PA DEP to breach this dam. Breach is expected to occur in 2020
Milltown Dam (D15-146)	X	10/22/10		Board of Supervisors	Township has applied for permit from PA DEP to breach this dam. The breach is expected to occur in 2021

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)		X		
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Code Department	2 Building Inspectors
Emergency Manager				
NFIP Floodplain Administrator	X		Code Department	
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community	X			
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants	X		Park and Rec Department	
Staff with expertise or training in benefit-cost analysis	X		Finance Department	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Finance Department	
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Finance Department	Sewer Only
Stormwater Utility Fees		X		
Development Impact Fees	X		Code Department	Act 209 Impact Fee
General Obligation, Revenue, and/or Special Tax Bonds	X		Finance Department	
Partnering Arrangements or Intergovernmental Agreements	X		Regional Police Department with Westtown Township - Board of Supervisors Public Sewer Services with West Goshen Township – Board of Supervisors and Municipal Authority	

Other				
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4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		Code Department	Public Education as required by MS4 Permit from PA DEP
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST GOSHEN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	No	The updated FIRM (DFIRM) is available online with the FEMA Map Service Center @ msc.fema.gov. A digital copy of the FIS is also available with the FEMA Map Service Center.
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	Adopted by Township on 7/11/17 Effective date of FIRM 9/29/2017
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	East Goshen would support any property owner's request to amend the FIRM with administrative support.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	East Goshen can provide FEMA with updated data when available.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	East Goshen Township has a certified CF on staff to assist property owners with SFHA determinations.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Code Department

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Code Department
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Code Department – We require that the floodplain be identified on the plans.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Code Department – Only for construction within the floodplain
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Code Department
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Review of building permit applications and respond to complaints

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	East Goshen Township has adopted a comprehensive floodplain ordinance regulating all development within the SFHA's.

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	We communicate any changes to the FIRM and Floodplain ordinance to all residents via our website, newsletter and local newspaper.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	The Township has trained staff (CFM) to answer Flood Insurance related questions.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST GOSHEN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	Available on Line
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	7/11/17
c. Does the municipality support requests for map updates?	If yes, specify how.		
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Code Department

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Code Department
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Code Department – We require that the floodplain be depicted on plans.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Code Department – Only for construction within the floodplain
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	No	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Review of building permit applications and respond to complaints

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	We prohibit new construction within the floodplain

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	We publicized most recent change to FIRM
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Rick Smith _____ **Title:** Township Manager _____ **Jurisdiction:** East Goshen Township _

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
No Goal 1	Reduce the risk to public safety and public health	
No changes required		
Goal 2	Reduce personal and property disaster losses	
No changes required		
Goal 3	Increase disaster resilience of public and private infrastructure	
No changes required		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
<p>Why limit this to “replacement construction”?</p> <p>Suggest - Ensure that all new construction is hazard resistant and does not increase hazard risk or exacerbate the effects of hazards</p>		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
<p>No changes required</p>		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
<p>Suggest - Raise public awareness of hazard mitigation within the community</p>		

Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	No					Has this activity been integrated into the municipality's normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction			We administer the UCC			Has this activity been integrated into the municipality's normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan						Has this activity been integrated into the municipality's normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities	No Progress					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	No Progress					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA ad FEMA region III-Mitigation Division	No Progress					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			Apply for any funding available			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures			Put PennDOT notices on web site.			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			Put County Notices on website			Has this activity been integrated into the municipality's normal operations?
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events			We posted most recent updates on web site			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						Has this activity been integrated into the municipality's normal operations?
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			We have installed infiltration inlets at some locations			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances			Yes			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities	We do not have any regional flood control facilities					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				We have several options in our zoning that minimize the impact of development		<i>Has this activity been integrated into the municipality's normal operations?</i>
F-12. Continue to maintain the stream gauges	We do not have any stream gauges					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-13. Continue to maintain the stream gauges within the County	We do not have any stream gauges					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	No					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	No					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas					We do not plant bushes to stop drifting	<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			We publicize and participate in the program			<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management	No Progress					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	No Progress					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-1. Provide public information on the effects of droughts on public and private wells			We post info from County on our website			<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	We do not do this.					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	No progress					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-2. Plan for and implement strengthened security at public events			Yes			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events	No					Has this activity been integrated into the municipality's normal operations?
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	No					Has this activity been integrated into the municipality's normal operations?
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	No					Has this activity been integrated into the municipality's normal operations?
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process						Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	No railroads in Township					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			We sweep streams annually and maintain signs on Township Roads			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				Completed		<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	We do not have any privately owned digital billboards. The Township has two digital signs that we use to keep residents informed.					Has this activity been integrated into the municipality's normal operations?
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	No					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	No					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	No					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	No					<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						

Mitigation Action Plan Review Worksheet- East Goshen

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for East Goshen Township			X			In addition to our web site and quarterly newsletter the Board of Supervisors includes information about ReadyChesco and Smart 911 on each of its meeting agendas and any notification letter they send out to the Township.
Emergency alerting systems for East Goshen Township			X			The Township continues to encourage residents to sign up for ReadyChesco, and Smart 911

Hazard Identification and Risk Evaluation Worksheet

Name: Neil Lovekin _____ Title: __Township Manager_____

Jurisdiction: _East Marlborough Township_____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input checked="" type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|---|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input checked="" type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input checked="" type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input checked="" type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: East Marlborough Township Point of Contact Name and Title: Neil Lovekin, Township Manager

Phone: 610-444-0725 E-mail: nlovekin@eastmarlborough.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X	2012		Police Dept., Chief	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	X	12/2019		ZHB, BOS, ZO	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	2012		BOS, PC	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2011		BOS, PC	
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1/2021		EAC, PC, BOS	Update to be adopted 1/2021
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code					
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)		X		
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		X		
Emergency Manager		X		
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes	X		Admin, Berkheimer	
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Admin	
Stormwater Utility Fees		X		
Development Impact Fees	X		Admin	
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X		Admin	
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability	X		
Financial Capability	X		
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST MARLBOROUGH TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.		
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.		
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Through Township Engineer and Zoning Officer/Floodplain Administrator
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Unknown	



2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		Depends on any findings during the permit review
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	During plan review
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Per ICC
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	No	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Action Plan Review Worksheet- East Marlborough Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for East Marlborough Township	X					
Emergency alerting systems for East Marlborough Township	X					
Install back-up batteries for short term power outages for all traffic signals within the township				X		Generator hookups included
Placement of temporary road barriers at the intersection of Walnut Road and Longwood Road				X		Placed as needed
Purchase and install back-up generator at 721 Unionville Road				X		Completed 2013

Municipality: East Nantmeal Township

Name of Representative from Municipality: Kathleen Brumfield, Township Secretary

Date: 11/23/20

Time: 1:40pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No change

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

No change

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

On going actions as identified in the 2015

4. What updates do you have to your planning and administrative capabilities since 2015?

No change

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology- County GIS Data, otherwise no

Water Sewer Authority-

Capital Improvement Plans- No change

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Testing- No

Hazard Identification and Risk Evaluation Worksheet

Name: Kim Moretti

Title: Township Manager

Jurisdiction: EAST PIKELAND TOWNSHIP

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

INVASIVE SPECIES – SPOTTED LANTERNFLY

PANDEMIC & INFECTIOUS DISEASE – Impact on Public; not necessarily on township operations

Capability Assessment Survey

Jurisdiction: EAST PIKELAND TOWNSHIP

Point of Contact Name and Title: KIM MORETTI, Township Manager

Phone: (610) 933-1770

E-mail: manager@eastpikeland.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X				Rely on Chester Co. DES
Emergency Operations Plan	X				Rely on Chester Co. DES
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	6/6/17			Article 4 of township Zoning Ordinance.
Floodplain Management Plan	X	6/6/17			Article 4 of township Zoning Ordinance
Zoning Regulations	X	9/16/19			



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	6/2/15			
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	9/16/19			Phoenixville Regional Comprehensive Plan as adopted by participating municipalities
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1/7/13			Amendment to Comprehensive Plan
Stormwater Management Plan / Ordinance	X	10/2/19			
Natural Resource Protection Plan	X	6/6/17			Article 4 of Zoning Ordinance
Capital Improvement Plan					
Economic Development Plan	X	1/7/13			Amendment to Comprehensive Plan
Historic Preservation Plan	X	6/2/15			Article 16 of Zoning Ordinance
Farmland Preservation					
Building Code	X				Utilize 2015 International Building Code
Fire Code	X				Utilize 2015 International Building Code
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X	THEURKAUF DESIGN & PLANNING	3 rd Party consultant
Planners or engineers (with natural and/or human caused hazards knowledge)		X	LTL CONSULTANTS	3 rd Party consultant
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		X	LTL CONSULTANTS	
Emergency Manager	X			Police Chief serves as Emergency Management Coordinator
NFIP Floodplain Administrator				
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants	X		Administrative staff	
Staff with expertise or training in benefit-cost analysis				
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements		X		
Other				

- 4. Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		No specific program in place, however we do include educational articles in periodic township newsletters.
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST PIKELAND TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	
c. Does the municipality support requests for map updates?	If yes, specify how.	YES	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	NO	We share maps with public but provide no technical assistance.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	NO	East Pikeland Township does not allow encroachments in the SFHA
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	However, East Pikeland Township does not allow encroachments in the SFHA
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	However, East Pikeland Township does not allow encroachments in the SFHA
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	NO	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	YES	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	East Pikeland Township ordinance prohibits any encroachments including new construction, substantial improvements, fill, development, unless it has been demonstrated with technical analysis that the proposed encroachment would not result in any increase in flood levels.

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	NO	East Pikeland Township staff does not have expertise in flood insurance.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO	East Pikeland Township staff does not have expertise in flood insurance.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	East Pikeland Township staff does not have expertise in flood insurance.

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Kimberly Moretti **Title:** Township Manager **Jurisdiction:** EAST PIKELAND TOWNSHIP

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					Rely on Chester County
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan	X					Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			Duty of Emergency Management Coordinator
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					<i>Has this activity been integrated into the municipality's normal operations? Rely on County</i>
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			<i>Has this activity been integrated into the municipality's normal operations? When necessary after flood event.</i>
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-11. Enhance the communications equipment between the County and the municipalities				X		
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery	X					
AH-13. Continue infrastructure improvements through community development	X					
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			<i>Educational articles included in periodic township newsletters.</i>
AH-15. Implement a system to report blocked/closed roads			X			<i>Website; Facebook</i>
FC-16. Provide education to the municipalities on resident evacuation processes and need						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-17. Provide education to the municipalities on tracking road closures			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines			X			
TS-2. Sustain tree management programs around power lines			X			
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County			X			<i>Educational articles included in periodic township newsletters.</i>
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains				X		Has this activity been integrated into the municipality's normal operations?
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps				X		
F-6. Follow state and County stormwater regulations				X		
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)				X		
F-9. Manage integrity and functions of existing regional flood control facilities	X					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				X		Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-12. Continue to maintain the stream gauges				X		Has this activity been integrated into the municipality's normal operations?
F-13. Continue to maintain the stream gauges within the County	X					Has this activity been integrated into the municipality's normal operations?
F-14. Install stream gauges if an additional area is identified to benefit from one	X					Has this activity been integrated into the municipality's normal operations?
F-15. Provide education to the municipalities on flood gauges	X					Has this activity been integrated into the municipality's normal operations?
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road				X		
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs				X		
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows				X		
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			<i>Educational articles included in periodic township newsletters.</i>
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents				X		
WS-3. Improve storm drains throughout the County to handle snow melt			X			
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			<i>Has this activity been integrated into the municipality's normal operations? Rely on County</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	X					
TOR-3. Provide public information on debris management	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County		X				Currently amending township zoning to encourage low impact development.
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	X					<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation		X				
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			X			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process						<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages				X		<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction						Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County						Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices				X		
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources				X		
IL-4. Plan for replenishment fuel for generators				X		
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	X					

Municipality: East Vincent Township

Name of Representative from Municipality:

Catherine Ricardo Township Manager

Date: 23-Oct-20

Time: 1400 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No None

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

French Creek area some flooding during heavy rains

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

None at this time

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Yes

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- Yes

NFIP Ordinance- Yes

Building Codes- Yes

GIS Technology-County

Water Sewer Authority- With in the Township no separate authority

Capital Improvement Plans- Yes Township Building and Software upgrades

Building Code- Township Employee

Engineer- Third Party

Planning Commission- Yes

Stormwater Management Ordinance/MS4 Plan- Yes

Hazard Identification and Risk Evaluation Worksheet

Name: Loren Nafziger Title: EMC

Jurisdiction: East Whiteland Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	Extensive HM remain in district and passing through district.
Nuclear Incidents	NC	
Transportation Accidents	I & D	Increase in number of accidents with increased traffic volume and a decrease in severity of accidents due to highway, roadway, and vehicle safety improvements.

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Covid 19 has affected general operations in all areas and while this event has not been overwhelming for us, any significant increases or subsequent events could be worse.

Jurisdiction Risk - East Whiteland Twp (Municipality)

Hazard	Score	Comparison
Dam Failure	1.3	<
Drought & Water Supply Deficiencies	2.5	<
Earthquake	2.2	=
Environmental Hazards Hazardous Materials Release	2.9	>
Extreme Temperatures	2.7	=
Flood, Flash Flood, and Ice Jam	3.2	<
Hurricane and Tropical Storm	2.1	=
Invasive Species	2.8	=
Nuclear Incident	1.9	>
Opioid Addiction Response	3.1	=
Pandemic & Infectious Disease	3.1	=
Environmental Hazard Gas & Liquid Pipelines	2.6	>
Radon Exposure	2.3	=
Structural Fires	2.2	=
Terrorism	2.8	=
Tornado, Windstorm	3.1	=
Transportation Accident	2.4	>
Utility Interruption	3.5	=
Winter Storm	2.7	=

- > Your municipality's risk from this hazard is greater than the county's risk as a whole
- < Your municipality's risk from this hazard is less than the county's risk as a whole
- = Your municipality's risk from this hazard is about the same as the county's risk as a whole

Capability Assessment Survey

Jurisdiction: East Whiteland Township

Point of Contact Name and Title: Loren Nafziger EMC

Phone: 610-633-5983

E-mail: Lnafziger@eastwhiteland.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	2015		Chester County	
Emergency Operations Plan	X	02/2019		EWT	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan			X	EWT	
NFIP	X				
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	08/2017			
Floodplain Management Plan					
Zoning Regulations	X	2007			Continual updates



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	12/1999			Continual updates
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2016			
Open Space Management Plan (or Parks/Rec or Greenways Plan)			X	EWT	
Stormwater Management Plan / Ordinance	X	01/2014			
Natural Resource Protection Plan	X		X	EWT	Some in place with zoning with updates contained in upcoming open space plan
Capital Improvement Plan	X	2020			
Economic Development Plan					
Historic Preservation Plan	X				
Farmland Preservation					
Building Code	X				2015 IBC
Fire Code	X				2015 IFC
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X			
Planners or engineers (with natural and/or human caused hazards knowledge)	X			Staff with 3 rd party consultants
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			Staff with 3 rd party consultants
Emergency Manager	X			
NFIP Floodplain Administrator	X			
Land Surveyors		X		3 rd party as needed
Scientists or staff familiar with the hazards of the community		X		3 rd party as needed
Personnel skilled in GIS and/or FEMA’s HAZUS program	X			Limited staff & 3 rd party contacts
Grant writers or fiscal staff to handle large or complex grants	X			Staff
Staff with expertise or training in benefit-cost analysis	X			Limited staff
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X			
Stormwater Utility Fees		X		
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X			Fire Dept safety trainings including EMS, Extinguishers, Fire safety, and Fire Prevention.
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Financial Capability			X
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: EAST WHITELAND TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	No	Access FIRM online
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	08/09/2017 Adoption
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	If they make sense
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	If information becomes available
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Use of Chescoviews & FIRM online
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Planning & Zoning

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	08/09/2017
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Planning & Zoning
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Planning & Zoning
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Planning & Zoning Codes & Life Safety
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Zoning Codes & Life Safety
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Calls, Plan review, Daily travel by Planning, Zoning, and Codes & Life Safety

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No Yes Yes Yes Yes	Zoning review – 200-55

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	During plan review & on website
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	Via U.S. Mail & on website
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	As requested

Any available information would be appreciated to add to website.

Completed by Ted Locker Zoning Officer



Mitigation Strategy 5-Year Mitigation Plan Review

Name: Loren Nafziger **Title:** EMC **Jurisdiction:** East Whiteland Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-4. Provide regular updates to the countywide Mass Care Plan			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities			X			<i>Has this activity been integrated into the municipality’s normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division		X				Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters		X				Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
F-12. Continue to maintain the stream gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering		X				<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages		X				<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster		X				Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction		X				Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations		X				Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



Mitigation Action Plan Review Worksheet- East Whiteland Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for East Whiteland Township		X				Twp website, Twitter, Notify Me, Communication Coordinator Employee
Emergency alerting systems for East Whiteland Township		X				Notify Me, Reverse 911, PD/FD Sign Boards
Install gates to be closed during flood incidents and signage at Old Morehall Road	X					Discussed in past, unknown future
Install gates to be closed during flood incidents and signage at Church Road	X					Discussed in past, unknown future
Increase culvert size at Spring Road				X		
Strengthen Embankment at Ravine Road			X			Small improvements as incidents occur
Increase stormwater pipe size at Hillbrook Circle	X					Found to be larger than expected project with further exploration needed
Purchase and install permanent emergency generators at sewer pumping stations		X				Two stations left to complete
Purchase emergency generators at 18 traffic signals within the township				X		18 generators available to rotate as needed among 38 traffic signals

Mitigation Strategies for Consideration Worksheet Response

East Whiteland Township

1. We have no repetitive loss properties and no known flooding issues. Several flooding areas were listed in the County Plan already.
2. A, C, & D
3. Stormwater - Church Road between Swedesford Rd & Foreside Rd – under MS4 review with all work required upstream from the location on private property

Stormwater – Lancaster Ave (Bus Rt 30) / Deerfield Ln – Railroad & Private Property run off onto Lancaster Ave which is a State Rd. – Twp not addressing at this time due to multiple parties involved

4. Twp is in the planning stages of commissioning a study to assess and prioritize the status of our stormwater system.
5. Fixed facility: Lee Blvd – large cold storage facility & manufacturing facilities, Great Valley Parkway – Pharmaceutical R&D & manufacturing facilities, Bacton Hill Rd – Propane distribution site, Malin Rd – Bulk Petroleum storage facilities, Bishop Tube Superfund site

Pipeline: Numerous petroleum and natural gas pipelines throughout the Twp.

Transportation Corridors: Rt 202, PA Turnpike, Lancaster Ave (Bus Rt 30)

6. N/A
7. Ravine Rd. has had minor bank erosion after major storm events. Twp repairs as needed with only threat to the roadway.
8. Sinkhole issues at various locations in the Twp with the main problem areas on Flat Rd, Lee Blvd, and Phoenixville Pike. Repairs completed as needed with closest threatened infrastructure being a pump station and roadways.
9. Pipelines, Bulk Storage Facilities, Several large corporate data centers

10. N/A

11. Twp facilities are covered at this time. Immaculata University had expressed interest in improving their resistance to outages as they believe they have identified an area that is susceptible to power lines being downed by trees. However, those trees are believed to be on private property that is not owned by the university. I do not know what communications they have had with PECO on this matter.

12. The Twp is in the design process for a new separate building for the Police Department. Once that building is completed, the main Twp building is presumed to undergo renovations to expand the Administration offices into the former Police station. When that project goes into design, there has been discussion of incorporating a warming/cooling area for use by residents and possibly an additional space for use as an EOC. Only preliminary thoughts at this time with no time frame or feasibility available.

Mitigation Action Plan Review Worksheet- Easttown Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Easttown Township			X			Website, Facebook, and email
Emergency alerting systems for Easttown Township				X		Reverse 911 using Blackboard
Upgrade existing stormwater management systems to address increased water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed			X			
Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed	X					

Hazard Identification and Risk Evaluation Worksheet

Name: ___Barclay Hargreaves_____ Title: ___EMC_____

Jurisdiction: ___Elverson Boro and West Nantmeal Twp_____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Municipality: Franklin Township

Name of Representative from Municipality: Franklin Township Assistant Township Manager Jeff Eastburn

Date: 11/23/20

Time: 4pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No other changes

Tropical storm isais- worst flooding seen in a while (quantity of roads inundated), more intensity in storms. Increase in residential calls

Clogged inverts

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

512 Chesterville Road (could use for water to be diverted) can see

North Clay Creek and Churchill road (flooding)

Strickersville Rd and Appleton Road (flooding at Green Bridge)

Blocked inlets at 896 between Goodhope Rd and Gypsey Hill (debris not removed from area, just inlet)

3. Are their mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Continuous,

Complete – radio station

Social media

4. What updates do you have to your planning and administrative capabilities since 2015?

Not a lot of residential development over the past five years. Mostly renovations.

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology-

Water Sewer Authority-

Capital Improvement Plans-

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Requirement- Unsure , testing may not explicitly by township, but is a requirement for banks.

Road Crew-

Municipality: Highland Township

Name of Representative from Municipality: Billy Beers /Gerry McKee

Date: October 2020

Time:

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update? NO
2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?) NO CHANGE
3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall. NO CHANGE
4. What updates do you have to your planning and administrative capabilities since 2015?

Updating Comprehensive Plan

EOP – None

SALDO – None

Zoning – Yes, per Attorney General (2016)

Flood Plain Ordinance – None

NFIP Ordinance – None

Building Codes – 2015 Codes

GIS Technology – None

Water Sewer Authority – PA American

Capital Improvement Plans –

Building Code – None

Engineer – None

Planning Commission – None

Stormwater Management Ordinance/MS4 Plan – None

Hazard Identification and Risk Evaluation Worksheet

Name: _____ Robert D. Esposito Jr _____ Title: ___ Emergency Management Coordinator _____

Jurisdiction: ___ Honey Brook Borough _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	Finding that additional spots in the municipality continue to flood
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	In recent history these issues seem to be prolonged
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	Increased traffic flow in the 322 corridors has increased traffic accidents within the past few years

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Honey Brook Borough Point of Contact Name and Title: Robert D. Esposito Jr. Emergency Management Coordinator

Phone: 484-832-5336 E-mail: RDEsposito46@gmail.com

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X				
Emergency Operations Plan	X				
Disaster Recovery Plan	X				
Evacuation Plan	X				
Continuity of Operations Plan	X				
NFIP			X		
NFIP – Community Rating System			X		
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)			X		
Floodplain Management Plan			X		
Zoning Regulations	X				

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X				
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X				
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan	X				
Capital Improvement Plan	X				
Economic Development Plan			X		
Historic Preservation Plan			X		
Farmland Preservation			X		
Building Code					
Fire Code			X		
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)	X			
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			
Emergency Manager	X			
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees	X			
Water / Sewer Fees	X			
Stormwater Utility Fees	X			
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X			
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Financial Capability		X	
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: HONEY BROOK BOROUGH

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	NO	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	NO	
c. Does the municipality support requests for map updates?	If yes, specify how.	NO	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	NO	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	NO	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	YES	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	NO	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	NO	
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	NO	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	NO	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	NO	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	

Hazard Identification and Risk Evaluation Worksheet

Name: _____ Robert D. Esposito Jr _____ Title: ___ Emergency Management Coordinator _____

Jurisdiction: ___ Honey Brook Township _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	Finding that additional spots in the municipality continue to flood
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	In recent history these issues seem to be prolonged
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	Increased traffic flow in the 322 corridors has increased traffic accidents within the past few years

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _____ Honey Brook Township _____ Point of Contact Name and Title: Robert D. Esposito Jr. Emergency Management Coordinator

Phone: ___ 484-832-5336 _____ E-mail: ___ RDEsposito46@gmail.com _____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X				
Emergency Operations Plan	X				
Disaster Recovery Plan	X				
Evacuation Plan	X				
Continuity of Operations Plan	X				
NFIP			X		
NFIP – Community Rating System			X		
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)			X		
Floodplain Management Plan			X		

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Zoning Regulations	X				
Subdivision Regulations	X				
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X				
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan	X				
Capital Improvement Plan	X				
Economic Development Plan			X		
Historic Preservation Plan			X		
Farmland Preservation			X		
Building Code					
Fire Code			X		
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)	X			
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			
Emergency Manager	X			
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees	X			
Water / Sewer Fees	X			
Stormwater Utility Fees	X			
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X			
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Financial Capability		X	
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: _____ HONEY BROOK TOWNSHIP _____

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	NO	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	NO	
c. Does the municipality support requests for map updates?	If yes, specify how.	NO	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	NO	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	NO	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YESP	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	YES	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	NO	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	NO	
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	NO	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	NO	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	NO	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	

Hazard Identification and Risk Evaluation Worksheet

Name: John Morris Title: EMC

Jurisdiction: Borough of Kennett Square

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	Damage to infrastructure
Hurricane and Tropical Storm	I	Damage to infrastructure, loss of power to critical infrastructure
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	I	Windstorms loss of power
Winter Storm	D	No snow last winter
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	I	Extra policing/graffiti removal
Conventional/Improvised Bombs	NC	
Cyber Terrorism	I	Police report an up tick in cyber crimes- more fraud than terrorism

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Dam Breaches	NC	
Extended Utility, Data, or Telecomm Disruptions	I	All disruptions storm related
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Utility interruptions significantly affect our infrastructure- water distribution, sewage treatment and traffic signals

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: BOROUGH OF KENNETT SQUARE

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	yes	Codes and Zoning Department



2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	no	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	yes	Reviews done by Borough Engineering firm
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	yes	Codes Department
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	yes	Borough Engineer
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	yes	Through Codes Department citations and inspections and with citations

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	no	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	no	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	yes	By mail
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	no	

Mitigation Action Plan Review Worksheet- Kennett Square Borough

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Kennett Square Borough			On going			
Emergency alerting systems for Kennett Square Borough				Completed		
Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St West of Union St	Nothing yet					
Improve culverts and inlet boxes to better handle rain to reduced localized flooding of the entire length of E Birch St		Working on funding				
Reengineer access road to sewage plant at 650 W South Street (Kennett Sewage plan)	Unknown					

Roads that flood in Kennett TWP and Kennett Borough. They asked to add theirs in also.

1. Pemberton Rd Bridge floods on Heavy rains (mill Rd to Cedar Springs)
2. South Street Road floods pipes over full + stream over Banks (Scarlet to Chandler Mill)
3. West Hillendale stream over flows Banks (Chandler Mill to Scarlet)
4. Chandler Mill Road Road Floods stream overflow Banks (West Hillendale to Round Hill)
5. Bucktoe Road stream erodes Banks flood Rd loss of Road (Kaolin to Sharp)
6. Kaolin Rd Flooded Road ways stream overflows Banks (Chandler Mill to Bucktoe)
7. Marshall bridge at Rt 82 South stream overflow Banks floods Rd.
8. East Hillendale Between (McFadyen + Bayard) also (Bayard to Rosedale) Road Flooding
9. Rosedale Rd stream overflow (Walnut St to McFadyen)
10. Bayard Rd at Rosedale stream overflow Banks
11. Center Mill Rd stream overflow (Burnt Mill Rd to Delaware Line)



Kennett Borough List

East South Street between S Walnut + Broad Street
Walnut Street between Birch + E South
West South Street at Lafayette and Grant Way

Hazard Identification and Risk Evaluation Worksheet

Name: Jeff Hammaker Title: Emergency Management Coordinator

Jurisdiction: Kennett Twp. PA

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	I	temperature shifts are Hotter than previous years
Flood, Flash Flood, and Ice Jam	I	Storms are more extreme with rainfall and the creeks where everything goes are easily overwhelmed
Hurricane and Tropical Storm	I	1999 and 2003 we had our 100 and 500 year floods from tropical storms
Radon Exposure	NC	
Thunderstorm	I	Shifting weather patterns are causing earlier and more powerful storms
Tornado and Windstorm	I	Tornado NC Windstorms have become stronger and increased frequency
Winter Storm	D	Winter heavy snowfalls decreased
Human-made Hazards		
Armed Attacks	I	Increased for surrounding areas



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Civil Disturbance	I	Political groups intentionally orchestrating civil disturbance
Conventional/Improvised Bombs	NC	
Cyber Terrorism	I	Preying on uninformed web users
Dam Breaches	NC	Any dam breach will pose no threat to residents or structures in Kennett Twp
Extended Utility, Data, or Telecomm Disruptions	I	Power disruptions can be long lasting due to storm damage
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	Mostly due to people using phones instead of actually watching the road

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Weather related issues especially related to flooding are a concern as the Red Clay and White Clay creeks can go to full stage and into flood stage with any thunderstorm with little time to prepare.

Capability Assessment Survey

Jurisdiction: ___KENNETT TWP

Point of Contact Name and Title: Eden Ratliff- Township Manager

Phone: _610-388-1300_____

E-mail: _____eden.ratliff@kennett.pa.us_____

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X	2018		TWP, EMC, PD, FD	
Disaster Recovery Plan				PEMA, FEMA	
Evacuation Plan	X	2018		TWP, EMC, PD, FD	
Continuity of Operations Plan	X	2018		TWP, EMC, PD, FD	
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)				TWP, PEMA, Federal	
Floodplain Management Plan				TWP, PEMA, Federal	
Zoning Regulations	X			TWP	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X			TWP, STATE	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X			TWP	
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X			TWP	
Stormwater Management Plan / Ordinance	X			TWP, STATE	
Natural Resource Protection Plan				TWP, STATE, Federal	
Capital Improvement Plan	X			TWP	
Economic Development Plan	X			TWP, COUNTY, STATE	
Historic Preservation Plan				TWP, COUNTY, STATE	
Farmland Preservation				TWP, COUNTY, STATE	
Building Code	x			TWP, COUNTY, STATE	
Fire Code	x			TWP FIRE MARSHALL	
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)			TWP	
Planners or engineers (with natural and/or human caused hazards knowledge)			TWP	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)			TWP	
Emergency Manager	x		TWP, FD	
NFIP Floodplain Administrator				
Land Surveyors			TWP	
Scientists or staff familiar with the hazards of the community	x		EMC, TWP, PD, FD	
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis	x		TWP	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming				
Community Development Block Grants (CDBG)				
Special Purpose Taxes				
Gas / Electric Utility Fees				
Water / Sewer Fees	X			
Stormwater Utility Fees				
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)				
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		CHESCO OEM	
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach			X

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: _____KENNETT TOWNSHIP_____

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Planning & Zoning
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Planning & Zoning
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Planning & Zoning
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Planning & Zoning
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Planning & Zoning

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		



Objective		
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Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					Has this activity been integrated into the municipality's normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality's normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan			X			Has this activity been integrated into the municipality's normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities		X				Has this activity been integrated into the municipality's normal operations?
AH-8. Arrange and hold hazard mitigation workshops for county residents			X			TWP holds house hold hazard drop offs as needed



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities			X			RUN BY CHESCO
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			EMC, TWP, CHESCO
AH-15. Implement a system to report blocked/closed roads			X			CHESCO has this set up on CAD system
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures						Has this activity been integrated into the municipality's normal operations?
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines		X				
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	X					
F-2. Educate county residents on the NFIP following flood events						Has this activity been integrated into the municipality's normal operations?
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains		X				Has this activity been integrated into the municipality's normal operations?
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Enforced by TWP



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations		X				
F-7. Enforce floodplain management ordinances		X				Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)				X		
F-9. Manage integrity and functions of existing regional flood control facilities	X					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges			X			Done by USGS funded by FEMA, PEMA
F-13. Continue to maintain the stream gauges within the County			X			Done by USGS funded by FEMA FEMA
F-14. Install stream gauges if an additional area is identified to benefit from one						Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-15. Provide education to the municipalities on flood gauges						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	x					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents				X		TWP STATE
WS-3. Improve storm drains throughout the County to handle snow melt	X					Not an issue
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Not an issue
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency				X		
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management			x			Has this activity been integrated into the municipality's normal operations? Yes
TOR-4. Retrofit critical public facilities with safe rooms						Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-1. Provide public information on the effects of droughts on public and private wells	X					Has this activity been integrated into the municipality's normal operations?
D-2. Promote sustainability programs and green practices throughout the County		X				
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					Has this activity been integrated into the municipality's normal operations?
PG-1. Encourage security check of bags/coolers at public gathering	X					Has this activity been integrated into the municipality's normal operations?
PG-2. Plan for and implement strengthened security at public events			X			Has this activity been integrated into the municipality's normal operations?
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens		X				
PG-6. Purchase temporary mobile camera to set up for events	X					Has this activity been integrated into the municipality's normal operations?
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					Has this activity been integrated into the municipality's normal operations?
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			X			Has this activity been integrated into the municipality's normal operations?
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			
PG-10. Increase advanced planning through use of the incident action plan process	X					Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations? yes
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	x					Has this activity been integrated into the municipality's normal operations?
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	x					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	x					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	x					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations		x				<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices			x			
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	x					
IL-3. Purchase backup generators for critical infrastructure/key resources				X		
IL-4. Plan for replenishment fuel for generators				X		
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	x					

Mitigation Action Plan Review Worksheet- Kennett Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Kennett Township	X					
Emergency alerting systems for Kennett Township		X				
Acquisition/Elevation of structure located at 611 Creek Road	X					
Acquisition/Elevation of structure located at 903 Creek Road	X					
Acquisition/Elevation of structure located at 909 Creek Road	X					
Purchase generators to run light during a power outage at all traffic signals within the township				X		
Install gates to be closed during flood incidents and signage at flood prone intersections within the township	X					
Ongoing upkeep of the bridge to ensure it is able to withstand the force of flood waters at flood prone bridges within the township			X			
Install warning signs to be utilized during flood incidents at flood prone bridges within the township	X					

Hazard Identification and Risk Evaluation Worksheet

Name: CAROLYN MATALON

Title: SECRETARY

Jurisdiction: LONDON BRITAIN TOWNSHIP

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: LONDON BRITAIN TOWNSHIP Point of Contact Name and Title: CAROLYN MATALON,SECRETARY

Phone: 610.255.0388 E-mail: CAROLYN.LONDONBRITAINWTP@COMCAST.NET

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	1/4/16		BOS	
Emergency Operations Plan	X	3/26/12		EMC & BOS	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	9/21/17		ZONING OFFICER	ZONING ORD AMENDMT FEMA
Floodplain Management Plan	X	9/21/17		ZONING OFFICER	ZONING ORD AMENDMT FEMA
Zoning Regulations	X	9/21/17		ZONING OFFICER	LAST REVISION



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	2007		ZONING OFFICER	SALDO
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2019		PLANNING COMM	UPDATED
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1992		BOS, PLAN COMM	
Stormwater Management Plan / Ordinance	X	12/9/13		ZONING OFFICER	
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan	X				HISTORIC COMMISSION
Farmland Preservation	X	2004		ASA BOARD, BOS	AG SECURITY, LBT LAND TRUST
Building Code	X	2004		BLDG INSPECTOR	UCC CODE
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		PLANNING COMMISSION	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		TOWNSHIP ENGINEER	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		TWP ENGINEER, BLDG INSPECTOR	
Emergency Manager	X		EMC	
NFIP Floodplain Administrator	X		ZONING OFFICER	
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants	X		TOWNSHIP TREASURER	
Staff with expertise or training in benefit-cost analysis		X		
Other		X		

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		TWP TREASURER	1 DEVELOPMT, 1 SHOPPES
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X		CHESTER COUNTY	
Other		X		

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		TWP STAFF	NEWSLETTER, WEBSITE
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		VARIOUS	WCC WATERTSHED, LBT LAND TRUST AND OTHER LAND TRUST ORG., OPEN SPACE TRAILS COMMITTEE
Other		X		

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability			X
Financial Capability			X
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: LONDON BRITAIN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	FIRM MAPS ARE AVAILABLE FOR REVIEW IN TWP OFFICE. ALL DIGITAL IS AVAILABLE ONLINE AT THE FEMA WEBSITE
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	2017
c. Does the municipality support requests for map updates?	If yes, specify how.	YES	ANY PERSON REQUESTING AN UPDAE WILL HAVE ACCESS TO TWP DATA
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	YES	TWP REQUESTS THAT DATA BE SENT TO LOCAL FEMA OFFICE
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	TOWNSHIP PROVIDES ACCESS TO ALL DATA IT HAS
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	TOWNSHIP SECRETARY

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	YES	ZONING/BLDG
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	ENGINEERING/ZONING
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	ZONING/BLDG
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	YES	ZONING/BLDG
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	YES	ORDINANCE ALLOWABLE ENFORCEMENT ACTIONS ARE TAKEN

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	PROHIBITED USES ARE AS FOLLOWS: PRODUCTION STORAGE OR MAINTENANCE OF CHEMICALS HOSPITALS, NURSING HOMES, JAILS NEW MFTGD HOME PARKS OR SUBIDV NEW MFTGD HOME OR SUBTANTIAL IMPROVEMENTS TO MFTGD HOME

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	NEW RESIDENTS CONTACTING TWP ARE INFORMED OF FLOOD INS
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	NEW RELEASES ARE POSTED ON TWP WEBSITE AND IN NEWSLETTER
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	REQUESTS FOR ASSISTANCT ARE HANDLED ON CASE BY CASE BASIS

Mitigation Strategy 5-Year Mitigation Plan Review

Name: CAROLYN MATALON **Title:** SECRETARY **Jurisdiction:** LONDON BRITAIN TOWNSHIP

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
<p>THE PUBLIC SAFETY AND PUBLIC HEALTH OF ALL RESIDENTS IS A TOP PRIORITY</p>		
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
ALL UCC AND FEMA GUIDELINES ARE FOLLOWED		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
WHEN HAZARDS ARE IDENTIFIED MITIGATION EFFORRS ARE IMPLEMENTED		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
RESIDENT AWARENESS IS IMPLEMENTED THROUGH THE TOWNSHIP WEBSITE AND NEWSLETTER.		



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan				X		Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities			X			
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery			X			TWP WEBSITE & NEWSLETTER
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads			X			
FC-16. Provide education to the municipalities on resident evacuation processes and need			X			
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			Has this activity been integrated into the municipality's normal operations?
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard			X			
AH-21. Encourage municipalities to require radon testing at the time sale of homes			X			
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines			X			
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County			X			
F-2. Educate county residents on the NFIP following flood events			X			Has this activity been integrated into the municipality's normal operations?
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps				X		
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)			X			
F-9. Manage integrity and functions of existing regional flood control facilities			X			Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	X					
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate			X			
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs				X		
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows		X				



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms	X					
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X			
WS-3. Improve storm drains throughout the County to handle snow melt			X			
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	X					
TOR-3. Provide public information on debris management				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County				X		
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	X					
PG-10. Increase advanced planning through use of the incident action plan process	X					Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction			X			Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources		X				
IL-4. Plan for replenishment fuel for generators	X					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	X					



Mitigation Action Plan Review Worksheet- London Britain Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for London Britain Township			X			WEBSITE AND NEWSLETTER
Emergency alerting systems for London Britain Township	X					AGEM AND CHESTER COUNTY PROVIDE THIS
Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd	X					
Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd	X					
Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd	X					
Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd	X					
Install gates to be closed during flood incidents and signage at Yeatmans Station Rd	X					
Install a snow fence during snow season to prevent snow drifting on Flint Hill Rd				X		INSTALLED EVERY WINTER
Install a snow fence during snow season to prevent snow drifting on Indiantown Rd				X		INSTALLED EVERY WINTER

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Install a snow fence during snow season to prevent snow drifting on South Bank Rd	X					
Install a snow fence during snow season to prevent snow drifting on Strickersville Rd	X					

Hazard Identification and Risk Evaluation Worksheet

Name: Robert Weer

Title: Fire Code Official/EMC

Jurisdiction: London Grove Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	D	2019 -2020 saw a decrease in winter storms
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Jurisdiction Risk - London Grove Township (Municipality)

Dam Failure	Drought & Water Supply Deficiencies	Earthquake	Environmental Hazards Hazardous Materials Release	Extreme Temperatures	Flood, Flash Flood, and Ice Jam	Hurricane and Tropical Storm	Invasive Species	Nuclear Incident	Opioid Addiction Response	Pandemic & Infectious Disease	Environmental Hazard Gas & Liquid Pipelines	Radon Exposure	Structural Fires	Terrorism	Tornado, Windstorm	Transportation Accident	Utility Interruption	Winter Storm
1.3	2.5	2.2	2.9	2.7	3.2	2.1	2.8	1.9	3.1	3.1	2.6	2.3	2.2	2.8	3.1	2.4	3.5	2.7
=	>	>	<	<	<	>	<	>	<	<	>	<	>	>	>	>	<	=

- > Your municipality’s risk from this hazard is greater than the county’s risk as a whole
- < Your municipality’s risk from this hazard is less than the county’s risk as a whole
- = Your municipality’s risk from this hazard is about the same as the county’s risk as a whole

Capability Assessment Survey

Jurisdiction: London Grove Township

Point of Contact Name and Title: Robert Weer Fire Code Official/EMC

Phone: 610-345-0100

E-mail: rweer@londongrove.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan		3/6/19		Fire Marshal/EMC	
Emergency Operations Plan		3/8/19		Fire Marshal/EMC	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan		3/20		Manager	
NFIP		9/6/17		LGT Zoning Officer	
NFIP – Community Rating System		9/6/17		LGT Zoning Officer	
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)		9/6/17		LGT Zoning Officer	
Floodplain Management Plan		9/6/17		LGT Zoning Officer	
Zoning Regulations		10/3/18		LGT Zoning Officer	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations		10/8/20		LGT Zoning	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)		3/2011		Planning Commission	
Open Space Management Plan (or Parks/Rec or Greenways Plan)		10/8/18		LGT Zoning	
Stormwater Management Plan / Ordinance		5/2014		LGT Zoning	
Natural Resource Protection Plan					
Capital Improvement Plan		2012-2016		Finance Director	
Economic Development Plan					
Historic Preservation Plan		10/2018		LGT Zoning	
Farmland Preservation		10/2018		LGT Zoning	
Building Code		1/2020		LGT Building Code Official	
Fire Code		1/2020		LGT Fire Code Official	
Other Standard of Response Cover		2/2019		LGT Fire Code Official	

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		LGT Zoning	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		LGT Code Department	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		LGT Building Dept	
Emergency Manager	X		LGT Fire Marshal/EMC	
NFIP Floodplain Administrator	X		LGT Zoning Officer	
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community	X		LGT Fire Code Official	
Personnel skilled in GIS and/or FEMA’s HAZUS program	X		LGT Manager	
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis	X		LGT Manager	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes	X			
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X			
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements		X		
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification				
Natural disaster or safety related school programs	X		LGT Fire Code Official	
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		LGT Fire Code Official	
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other Risk Assessment/Inspection Program	X		LGT Fire Code Official	

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability		X	
Financial Capability	X		
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: London Grove Township

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	The property owner is requested to make request to FEMA through the LOMC process
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Using FEMA mapping and GIS
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Floodplain manager

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	BCO, Zoning and floodplain manager
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Floodplain manager
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	BCO and floodplain manager
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	BCO, Engineer and floodplain manager
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	BCO, Zoning and floodplain manager

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	FEMA information
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	Mailers, website and facebook
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Robert Weer

Title: Fire Marshal /EMC

Jurisdiction: London Grove Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		

Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan		X				Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents		X				Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures		X				Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			Has this activity been integrated into the municipality's normal operations?
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events		X				Has this activity been integrated into the municipality's normal operations?
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains		X				Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations			X			Codes and Ordinances
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities			X			Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				X		Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					Has this activity been integrated into the municipality's normal operations?
F-14. Install stream gauges if an additional area is identified to benefit from one	X					Has this activity been integrated into the municipality's normal operations?
F-15. Provide education to the municipalities on flood gauges	X					Has this activity been integrated into the municipality's normal operations?
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road					X	
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs			X			Municipal employees are certified and maintain CEUs
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows			X			Municipality has software and mapping capabilities

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired			X			
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X	X		Public works has identified route for each vehicle
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas			X			Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance or policy outlining the process and implement a declaration of a snow emergency				X		Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris		X				Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events			X			Has this activity been integrated into the municipality's normal operations?
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events	X					Has this activity been integrated into the municipality's normal operations?
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					Has this activity been integrated into the municipality's normal operations?
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage	X					Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X	X		Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster		X				Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources				X		Municipal owned
IL-4. Plan for replenishment fuel for generators			X			Municipal owned
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



Mitigation Action Plan Review Worksheet- London Grove Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for London Grove Township			X			
Emergency alerting systems/public notification system for London Grove Township Golf Club	X					<i>Delayed due to cost</i>
Install gates to be closed during flood incidents and signage on Clay Creek Rd at E. Avondale Rd and Garden Station Rd	X					<i>County-wide project</i>
Install gate to be closed during flood incidents and signage on Sullivan Rd S/of Clay Creek Rd	X					<i>County-wide project</i>
Install gates to be closed during flood incidents and signage on Lake Rd at Baltimore Pike and at Raymond Ave.	X					<i>County-wide project</i>
Install gates to be closed during flood incidents and signage on Clay Creek Rd (south side) at Garden Station Rd and Church Hill Rd (Franklin Twp)	X					<i>County-wide project</i>
Install gates to be closed during flood incidents and signage on Garden Station at Ellicot Rd and W/of Clay Creek Rd	X					<i>County-wide project</i>
Reconfigure stream channel in front of 792 Lake Rd	X				X	<i>Only flooding area in TWP that directly impacts a residential structure</i>
Purchase generator for the traffic signal at Rt. 41 and Rt. 1				X		<i>Need permanent generator</i>

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Purchase generator for the traffic signal at Rt. 41 and Hepburn Rd				X		<i>Need permanent generator</i>
Purchase generator for the traffic signal at Rt. 41 and Baltimore Pike				X		<i>Need permanent generator</i>
Purchase and install a backup generator at 372 Rose Hill Rd				X		<i>Natural gas generator has been installed to run PW and Admin buildings</i>
Reconfigure stream channel at Sullivan Rd & Clay Creek Rd	X					
Widen bridge and bridge approaches at Indian Run Rd	X					

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.
Action Number:	
59-03	
<i>Location (address, lat/long)</i>	792 Lake Rd. - Lat. 39.831861/Long -75.801008
<i>Mitigation Technique Category</i>	Structure & Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flooding that impedes on a structure - Single Family Dwelling
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	\$10,000
<i>Potential Funding Streams</i>	FEMA/PEMA
<i>Timeline</i>	Long-term – 5 years or greater
<i>Lead Agency/Department</i>	London Grove Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Robert Weer
<i>Title</i>	EMC
<i>Agency/Department</i>	LGT/Emergency Management
<i>Phone</i>	610-3345-0100
<i>E-mail</i>	rwee@londongrove.org

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	Install gates and signage within flood prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters. County-Wide Project
Action Number:	
59-04	
Location (address, lat/long)	
	Lake Rd @ Raymond Ave (Lat. 39.830400/Long. -75.804996) & E. Baltimore Pk (Lat. 39.834005/Long. -75.798447) Clay Creek Rd @ Garden Station Rd (Lat. 39.802631/Long. -75.783772) & E. Avondale Rd (Lat. 39.813551/Long. -75.796196) Sullivan Rd S/O Clay Creek (Lat. 39.807141/Long. -75.794058) Garden Station @ Clay Creek (Lat. 39.802357/Long. -75.784639) Garden Station @ Ellicott Rd (Lat. 39.803595/Long. -75.781535)
Mitigation Technique Category	
	Structure & Infrastructure Project
Hazard(s) Addressed	
	Flood
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	County
Timeline	
	Short – 1 to 5 years
Lead Agency/Department	
	County of Chester/ Department of Emergency Management
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	London Grove Township/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	To remove an existing narrow culvert and replace with a structure to span the base flood elevation. Portions or all of the structure removal and replacement could be completed utilizing Municipal Public Works.
Action Number:	
59-05	
<i>Location (address, lat/long)</i>	Indian Run Rd @ Clay Creek Rd (Lat. 39.812405/Long.-75.794485)
<i>Mitigation Technique Category</i>	Structure & Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flooding
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA.PEMA, Regional & Local Grants, & Municipal Funds
<i>Timeline</i>	Long Term – 5 years of greater
<i>Lead Agency/Department</i>	London Grove Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Robert Weer
<i>Title</i>	EMC
<i>Agency/Department</i>	London Grove Township/Emergency Management
<i>Phone</i>	610-345-0100
<i>E-mail</i>	rweer@londongrove.org

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	Install alerting system/public notification system to provide warning/notification of potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.
Action Number:	
59-06	
<i>Location (address, lat/long)</i>	15 Athelone Way (Lat. 39.813283/Long. -75.803223)
<i>Mitigation Technique Category</i>	Education & Awareness Program
<i>Hazard(s) Addressed</i>	Hazardous Weather
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low =< \$10,000
<i>Potential Funding Streams</i>	FEMA.PEMA, Regional & Local Grants, & Municipal Funds
<i>Timeline</i>	Short Term – 1 to 5 Years
<i>Lead Agency/Department</i>	London Grove Township/Emergency Management
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Robert Weer
<i>Title</i>	EMC
<i>Agency/Department</i>	London Grove Township/Emergency Management
<i>Phone</i>	610-345-0100
<i>E-mail</i>	rweer@londongrove.org

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources
Action Number:	
59-01	
Location (address, lat/long)	
	Woodview Rd – Cross Street Chatham Rd & Gap Newport Pk. Closest Address - 326 Woodview Rd Lat. 39.838733/Long. -75.817756
Mitigation Technique Category	
	Structure & Infrastructure Project (SIP)
Hazard(s) Addressed	
	326 Woodview Rd (closest address)
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High => \$100,000
Potential Funding Streams	
	FEMA, PEMA, Municipal, and Private Funding
Timeline	
	Short – 1-5 years
Lead Agency/Department	
	London Grove Township/Public Works
Support Agency(ies)/ Department(s)	
	Emergency Management
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org

Mitigation Action Worksheet

Municipality:	Action
London Grove Township	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable unit as opposed to three permanent generators providing additional costs savings.
Action Number:	
59-02	
<i>Location (address, lat/long)</i>	333 Rose Hill Rd. - Lat.39.817563/Long -75.809758 748 E. Avondale Rd – Lat 39.809121/-75.804173 15 Athelone Way – Lat 39.812255/Long -75.800753
<i>Mitigation Technique Category</i>	Structure & Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Inability to operate critical infrastructure- Wastewater treatment
<i>Priority (High, Medium, Low)</i>	Medium - \$10,000 to \$100,000
<i>Estimated Cost</i>	\$75,000 (\$25,000 per electrical connection)
<i>Potential Funding Streams</i>	FEMA, PEMA, & Municipal funds
<i>Timeline</i>	Short – 1 to 5 years
<i>Lead Agency/Department</i>	London Grove Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Robert Weer
<i>Title</i>	EMC
<i>Agency/Department</i>	London Grove Township/Emergency Management
<i>Phone</i>	610-345-0100
<i>E-mail</i>	rweer@londongrove.org

Hazard Identification and Risk Evaluation Worksheet

Name: Chuck Freese Title: _____ EMC _____

Jurisdiction: Londonderry Township_

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	I	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	D	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Londonderry Township, Chester County Point of Contact Name and Title: Mark Harman, P.G./ARRO Consulting, Inc.

Phone: 717-560=6083

E-mail: Mark.Harman@ARROconsulting.com

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	x	9/12/17		Township Staff	
Floodplain Management Plan	X	9/12/17		Township Staff	
Zoning Regulations	x	4/9/19		Township Staff	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	x	7/12/16		ARRO Consulting, Inc	
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	x	4/27/15		ARRO Consulting, Inc	
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code					Utilize a BCO and State Code
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		x		Utilize consultants
Planners or engineers (with natural and/or human caused hazards knowledge)		x		Utilize consultants
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		x		Utilize consultants
Emergency Manager				
NFIP Floodplain Administrator	x		Township Staff	
Land Surveyors		x		Utilize consultants
Scientists or staff familiar with the hazards of the community		x		Utilize consultants
Personnel skilled in GIS and/or FEMA’s HAZUS program		x		Utilize consultants
Grant writers or fiscal staff to handle large or complex grants		x		Utilize consultants
Staff with expertise or training in benefit-cost analysis		x		Utilize consultants
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		x		
Community Development Block Grants (CDBG)		x		
Special Purpose Taxes		x		
Gas / Electric Utility Fees		x		
Water / Sewer Fees		x		
Stormwater Utility Fees		x		
Development Impact Fees		x		
General Obligation, Revenue, and/or Special Tax Bonds		x		
Partnering Arrangements or Intergovernmental Agreements		x		
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		x		
StormReady certification		x		
Natural disaster or safety related school programs		x		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		x		
Public-private partnership initiatives addressing disaster-related issues		x		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		x		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	x		
Administrative and Technical Capability	x		
Financial Capability	x		
Education and Outreach	x		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: LONDONDERRY TOWNSHIP, CHESTER COUNTY

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	no	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	no	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	no	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	yes	Township Office

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	yes	Floodplain administrator
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	no	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	yes	Floodplain administrator
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	no	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	yes	Ordinance compliance and permit processes

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	no	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	no	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	yes	If required via the Township website.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	no	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Mark Harman/ARRO Consulting, Inc. **Title:** P.G., Senior Vice President, Client Contact **Jurisdiction:** Londonderry Township, Chester County

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
No suggested changes to the goal or objectives.		
Goal 2	Reduce personal and property disaster losses	
No suggested changes to the goal or objectives.		
Goal 3	Increase disaster resilience of public and private infrastructure	
No suggested changes to the goal or objectives.		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
No suggested changes to the goal or objectives.		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
No suggested changes to the goal or objectives.		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
No suggested changes to the goal or objectives.		

Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective	None	
Objective	None	
Objective	None	
Goal		
Objective	None	
Objective	None	
Objective	None	



Goal		
Objective	None	
Objective	None	
Objective	None	

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					<i>Has this activity been integrated into the municipality’s normal operations? NO</i>
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			<i>Has this activity been integrated into the municipality’s normal operations? YES</i>
AH-4. Provide regular updates to the countywide Mass Care Plan	X					<i>Has this activity been integrated into the municipality’s normal operations? NO</i>
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community	X					
AH-7. Promote and provide emergency management training opportunities	X					<i>Has this activity been integrated into the municipality’s normal operations? NO</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
AH-11. Enhance the communications equipment between the County and the municipalities	x					
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery	x					
AH-13. Continue infrastructure improvements through community development			x			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			x			
AH-15. Implement a system to report blocked/closed roads	x					
FC-16. Provide education to the municipalities on resident evacuation processes and need	x					
AH-17. Provide education to the municipalities on tracking road closures	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	x					
AH-20. Provide public information surrounding Radon hazard	x					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	x					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	x					
TS-2. Sustain tree management programs around power lines	x					
TS-3. Encourage new development planning to include burying of utility cables	x					
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County			x			
F-2. Educate county residents on the NFIP following flood events	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			x			
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>
F-8. Implement the Act 167 Plan (Stormwater management)			x			
F-9. Manage integrity and functions of existing regional flood control facilities	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	x					
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-12. Continue to maintain the stream gauges	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-15. Provide education to the municipalities on flood gauges	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	x					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	x					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate			x			
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs			x			
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	x					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows			x			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	x					
WS-1. Provide public information on utility outages and the need to prepare for storms	x					
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			x			
WS-3. Improve storm drains throughout the County to handle snow melt	x					
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency	x					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	x					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	x					
TOR-3. Provide public information on debris management	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TOR-4. Retrofit critical public facilities with safe rooms	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
D-1. Provide public information on the effects of droughts on public and private wells	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
D-2. Promote sustainability programs and green practices throughout the County	x					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
PG-1. Encourage security check of bags/coolers at public gathering	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	x					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	x					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	x					
PG-6. Purchase temporary mobile camera to set up for events	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	x					
PG-10. Increase advanced planning through use of the incident action plan process	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			x			<i>Has this activity been integrated into the municipality's normal operations? YES</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events	x					
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-7. Provide public education on traffic accident reduction	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	x					<i>Has this activity been integrated into the municipality's normal operations? NO</i>
TRF-10. Enforcement of traffic laws	x					
IL-1. Provide private sector education/outreach related to cyber security best practices	x					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	x					
IL-3. Purchase backup generators for critical infrastructure/key resources	x					
IL-4. Plan for replenishment fuel for generators	x					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	x					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness	x					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	x					

Mitigation Action Plan Review Worksheet- Londonderry Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Londonderry Township			X			MS4, flooding, stromwater
Emergency alerting systems/public notification system for Londonderry Township	X					
Purchase and install a backup generator at the Municipal Building	X					
Remove dirt bank or change traffic pattern to one-way on Rt 926 and Hood Rd	X					
Purchase 2-way radios to assist in communication during emergency events in the township	X					
Install a permanent silt fencing to reduce the amount of dirt ending up on the roadway causing a dangerous intersection at Rt 796 and Rt 926	X					
Clear the brush in roadway lines of sight at Rt 796 and Rt 41	X					
Increase the height of the bridge at Whitehorse Rd near Creek Rd	X					
Locate, clean, and assess the capacity of the buried culvert at Elm Creek Rd and Ewing Rd	X					

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Locate, clean, and assess the capacity of the buried culvert in the area of 44 Saint Malachi Rd	X					
Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station	X					
Reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd	X					

Mitigation Action Worksheet

Municipality(ies):	Action	
LONDONDERRY TWP	IMPROVE PLANS + COMMUNICATION IN CASE OF EMERGENCY	
Action Number:		
Location (address, lat/long)	DALEVILLE + COCHRANVILLE RDs COCHRANVILLE, PA	
Mitigation Technique Category	LOCAL PLANS AND REGULATIONS	
Hazard(s) Addressed	ENVIRONMENTAL HAZARDS - APPELIVE	
Priority (High, Medium, Low)	MEDIUM	
Estimated Cost	5,000	
Potential Funding Streams	ESNG	
Timeline	SPRING 2021	
Lead Agency/Department	ESNG	
Support Agency(ies)/ Department(s)	LONDONDERRY TWP - COCHRANVILLE FIRE CO.	
Project Point of Contact		
Name	LOUIS F. SIMONE	
Title	CHAIRMAN BOARD OF SUPERVISORS	
Agency/Department	LONDONDERRY TWP	
Phone	610-869-2138	
E-mail	lfsimone@zoominternet.net	

Mitigation Action Worksheet

Municipality(ies):	Action	
LONDONDERRY TWP	IMPROVE PLANS + COMMUNICATION IN CASE OF EMERGENCY	
Action Number:		
Location (address, lat/long)	DALEVILLE + COCHTANWITTE RD COCHTANVILLE, PA	
Mitigation Technique Category	LOCAL PLANS AND REGULATIONS	
Hazard(s) Addressed	ENVIRONMENTAL HAZARDS - APPELIVE	
Priority (High, Medium, Low)	MEDIUM	
Estimated Cost	5,000	
Potential Funding Streams	ESNG	
Timeline	SPRING 2021	
Lead Agency/Department	ESNG	
Support Agency(ies)/Department(s)	LONDONDERRY TWP - COCHTANVILLE FIRE CO.	
Project Point of Contact		
Name	LOUIS F. SIMONE	
Title	CHAIRMAN BOARD OF SUPERVISORS	
Agency/Department	LONDONDERRY TWP	
Phone	610-869-2138	
E-mail	lfsimone@zoominternet.net	

Mitigation Action Worksheet

Municipality(ies):	LONDONDERRY TWP	
Action Number:	1	
Action:	CONSTRUCT A ROUNDABOUT AT THE INTERSECTION OF PA Rte 41 AND PA Rte 926	
Location (address, lat/long)	See Above	
Mitigation Technique Category	STRUCTURE AND INFRASTRUCTURE PROJECTS	
Hazard(s) Addressed	TRANSPORTATION ACCIDENTS	
Priority (High, Medium, Low)	High	
Estimated Cost	3,000,000	
Potential Funding Streams	PENN DOT + LONDONDERRY TWP	
Timeline	By Year 200	
Lead Agency/Department	PENN DOT	
Support Agency(ies)/Department(s)	PENN DOT	
Project Point of Contact		
Name	Louis F. Simone	
Title	Chairman Board of Supervisors	
Agency/Department	LONDONDERRY TWP	
Phone	610-869-2138	
E-mail	lfsimone@zoomin.net	

Mitigation Action Worksheet

Municipality(ies):	LONDONBERRY TWP	
Action:	IMPROVE & ENHANCE CULVERTS	
Action Number:	2	
Location (address, lat/long)	VARIOUS THROUGHOUT LONDONBERRY TWP	
Mitigation Technique Category	STRAINING AND INFRASTRUCTURE PROJECT	
Hazard(s) Addressed	FLOODING - FLASH FLOODS	
Priority (High, Medium, Low)	MEDIUM	
Estimated Cost	\$60,000	
Potential Funding Streams	STATE	
Timeline	2022	
Lead Agency/Department	LONDONBERRY TWP	
Support Agency(ies)/Department(s)	PENNDOT	
Project Point of Contact		
Name	LOUIS F. SIMONE	
Title	CHAIRMAN BOARD OF SUPERVISORS	
Agency/Department	LONDONBERRY TWP	
Phone	610-869-2138	
E-mail	lfsimone@zoominternet.net	

Investigation Action Worksheet

Municipality(ies):	LONDONBERY TWP
Investigation Number:	3
Location (address, lat/long)	103 DALEVILLE RD. COCHONTOWN, PA
Investigation Technique Category	LOCAL PLANS & REGULATIONS
Hazard(s) Addressed	EXTREME TEMPERATURE (UTILITY INTERRUPTION)
Priority (High, Medium, Low)	HIGH
Estimated Cost	15,000
Potential Funding Streams	TOWNSHIP GENERAL FUNDS
Timeline	SPRING 2021
Lead Agency/Department	LONDONBERY TOWNSHIP
Support Agency(ies)/Department(s)	N/A
Project Point of Contact	
Name	LOUIS F. SIMONE
Title	CHAIRMAN BOARD OF SUPERVISORS
Agency/Department	LONDONBERY TWP
Phone	610-869-2138
E-mail	lfsimone@zoominternet.net

Hazard Identification and Risk Evaluation Worksheet

Name: W. Ronald Kepler

Title: Emergency Management Coordinator

Jurisdiction: Lower Oxford Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Lower Oxford Township

Point of Contact Name and Title: W. Ronald Kepler, Emergency Management Coordinator

Phone: 610-932-8150 ext. 2

E-mail: loweroxfordtwp@zoominternet.net

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan	X	2009			
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X				
Floodplain Management Plan					
Zoning Regulations	X				



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X				
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan					
Capital Improvement Plan	X				
Economic Development Plan					
Historic Preservation Plan	X				
Farmland Preservation	X				
Building Code	X				
Fire Code	X				
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X			
Planners or engineers (with natural and/or human caused hazards knowledge)				
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			
Emergency Manager	X			
NFIP Floodplain Administrator				
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis				
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)				
Special Purpose Taxes				
Gas / Electric Utility Fees				
Water / Sewer Fees	X			
Stormwater Utility Fees				
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)				
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.				
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Financial Capability	X		
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: LOWER OXFORD TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.	No	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	No	

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	No	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: W. Ronald Kepler

Title: Emergency Management Coordinator

Jurisdiction: Lower Oxford Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan	X					Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community	X					
AH-7. Promote and provide emergency management training opportunities	X					Has this activity been integrated into the municipality’s normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	X					Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities	X					
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery	X					
AH-13. Continue infrastructure improvements through community development	X					
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments	X					
AH-15. Implement a system to report blocked/closed roads			X			
FC-16. Provide education to the municipalities on resident evacuation processes and need	X					
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	X					
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables	X					
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	X					
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	X					Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations	X					
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)	X					
F-9. Manage integrity and functions of existing regional flood control facilities	X					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	X					
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	X					
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms	X					
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents	X					
WS-3. Improve storm drains throughout the County to handle snow melt	X					
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	X					<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	X					
TOR-3. Provide public information on debris management	X					Has this activity been integrated into the municipality's normal operations?
TOR-4. Retrofit critical public facilities with safe rooms	X					Has this activity been integrated into the municipality's normal operations?
D-1. Provide public information on the effects of droughts on public and private wells	X					Has this activity been integrated into the municipality's normal operations?
D-2. Promote sustainability programs and green practices throughout the County	X					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					Has this activity been integrated into the municipality's normal operations?
PG-1. Encourage security check of bags/coolers at public gathering	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure			X			Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages			X			Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws	X					
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources	X					
IL-4. Plan for replenishment fuel for generators	X					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	X					

Mitigation Action Plan Review Worksheet- Lower Oxford Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Lower Oxford Township			X			
Emergency alerting systems for Lower Oxford Township			X			

Mitigation Action Plan Review Worksheet- Malvern Borough

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Malvern Borough			X			We developed a social media page along with posting link on our website and utilizing Ready Chesco for mass notifications.
Emergency alerting systems for Malvern Borough			X			Alerting through Ready Chesco for emergencies and closures.
Increase culvert size at 313 S Warren Ave	X					
Elevation/Acquisition of structures 10 through 142 W First Ave	X					Boro still working with residents to find a solution
Elevation/Acquisition of structures 2 through 10 Remington Ln	X					Boro still working with residents to find a solution
Elevation/Acquisition of structures 193 through 323 Paoli Pike	X					Boro still working with residents to find a solution
Elevation/Acquisition of structure located at 135 Powelton Ave	X					Boro still working with residents to find a solution
Elevation/Acquisition of structure located at 145 Powelton Ave	X					Boro still working with residents to find a solution
Elevation/Acquisition of structures 217 through 545 S. Warren Ave	X					Boro still working with residents to find a solution

Hazard Identification and Risk Evaluation Worksheet

Name: Ramsey Reiner Title: Township Manager

Jurisdiction: New Garden Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	I	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	
Tornado and Windstorm	I	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input checked="" type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species- SPOTTED LANTERNFLY | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: New Garden Township

Point of Contact Name and Title: Ramsey Reiner, Township Manager

Phone: 610.268.2915 x102

E-mail: rreiner@newgarden.org

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan		9/2020	X	EMC	In conjunction with Twp. Manager
Emergency Operations Plan	X	2/2012	X	EMC	Will update within the next year
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	X				



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	7/1999			
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	6/2018			
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	9/2008			
Stormwater Management Plan / Ordinance	X	11/2013			
Natural Resource Protection Plan	X	2/2013			
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan	X	7/2009			
Farmland Preservation					
Building Code	X	2015 w/2018 amendments		Codes Department	2015 ICC/2015 IPMC
Fire Code	X	2015			
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Codes & Zoning Officer	Christian Adamek
Planners or engineers (with natural and/or human caused hazards knowledge)				
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Codes/3 rd Party Consultant	Christian Adamek/BIU
Emergency Manager	X		3 rd Party Volunteer	Guy Swift
NFIP Floodplain Administrator				
Land Surveyors	X		3 rd Party	ARRO Engineering
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants	X		Township Secretary & Grants Coordinator	Kathryn Parlier
Staff with expertise or training in benefit-cost analysis	X		Township Manager	Ramsey Reiner
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)	X			
Special Purpose Taxes	X		EIT goes to Open Space Review Board	
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Sewer System in tentative sale agreement	
Stormwater Utility Fees		X		We do collect O&M escrow, but no specific SWM tax
Development Impact Fees	X		TIF	
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements	X		Multi-municipal Public Works Co-op	
Other				

- 4. Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X	KASD	
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		MS4, recycling education	
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		Open Space Review Board	
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: _____

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.		
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.		Yes. Map was recently updated. Any requests would be considered.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.		If necessary, we will.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.		Yes.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.		Yes.

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.		

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	no	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	no	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction	X					<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-4. Provide regular updates to the countywide Mass Care Plan	X					<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community	X					
AH-7. Promote and provide emergency management training opportunities	X					<i>Has this activity been integrated into the municipality’s normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	X					Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities	X					
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery	X					
AH-13. Continue infrastructure improvements through community development	X					
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments	X					
AH-15. Implement a system to report blocked/closed roads	X					
FC-16. Provide education to the municipalities on resident evacuation processes and need	X					
AH-17. Provide education to the municipalities on tracking road closures	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	X					
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables	X					
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	X					
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps	X					
F-6. Follow state and County stormwater regulations	X					
F-7. Enforce floodplain management ordinances	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-8. Implement the Act 167 Plan (Stormwater management)	X					
F-9. Manage integrity and functions of existing regional flood control facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	X					
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-12. Continue to maintain the stream gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	X					
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	X					



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms	X					
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents	X					
WS-3. Improve storm drains throughout the County to handle snow melt	X					
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency	X					Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	X					
TOR-3. Provide public information on debris management	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County	X					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	X					
PG-10. Increase advanced planning through use of the incident action plan process	X					Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage	X					Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events	X					
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)	X					Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws	X					
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources	X					
IL-4. Plan for replenishment fuel for generators	X					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	X					



Mitigation Action Plan Review Worksheet- New Garden Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for New Garden Township	X					
Emergency alerting systems for New Garden Township	X					
Construct larger culvert at Cedar Springs Rd at Pemberton Rd	X					
Construct larger culvert at Egypt Run Road	X					
Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike	X					
Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike	X					
Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike	X					
Purchase portable generator for traffic signal at Scarlett Rd south of Baltimore Pike	X					
Purchase portable generator for traffic signal at Newark Rd and Rt 41	X					
Purchase portable generator for traffic signal at Penn Green Rd and Rt 41	X					
Purchase portable generator for traffic signal at Southwood Rd and Rt 7	X					

Newlin Township- Robert Mastrippolito, Jr. EMC/Road master
Contacted: 1/28/21 at 11:15 am

Hazards: - Same and consistent, one concern about pipeline is the age of infrastructure. Pipeline companies do execute repairs though.

Planning Capabilities:

- Aqua services with well and pump system for one development
- All planning capabilities possible are subcontracted out (codes, GIS, engineering).
- Only one full time municipal staff member (one part-timer).
- Supervisors working toward plans to improve road conditions of many roads impacted by wash out or falling into creek beds.
- Insufficient culverts – Green Valley Road (in process of being redone by Penn DOT).

Mitigation actions:

Brandywine Creek Rd/Harvey's Bridge(flooding concerns)- no changes, 8 ton bridge, Chester County owns this bridge, infrastructure upgrades have been made to Brandywine Creek Road which is open now.

3 homes with driveways impacted by Laurel Road (supervisors are trying to plan improvements but very costly to township) which is missing 800 feet of road that fell in. It has added 17 minutes to ambulance response because traffic needs to go around missing road segment to get to other side.

Rt 162 between Cannery Rd and Stargazers Rd- Penn DOT cleared trees (complete)

Lost many Ash Trees to the Ash Borer

NC Hazard Identification and Risk Evaluation Worksheet

Name: Erica Batdorf Title: Township Manager

Jurisdiction: North Coventry Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm		
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC+	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: North Coventry Township

Point of Contact Name and Title: Erica Batdorf, Township Manager

Phone: 610-323-1694

E-mail: ebatdorf@northcoventry.us

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	5/23/16		CHESTER CO. ES	
Emergency Operations Plan	X	10/18/06		NCT EOC	UPDATED 1/20/13
Disaster Recovery Plan	X	10/18/06		NCT EOC	
Evacuation Plan	X	11/11/13		NCT EOC	
Continuity of Operations Plan	X	10/18/06		NCT EOC	
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	X	12/9/68		ZONING OFFICER	UPDATED 6/20/03



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2000		EAC	UPDATED 10/24/19
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	6/24/02		OPEN SPACE REVIEW BOARD	AMMENDED 9/9/2002 TOWNSHIP CODE CHAPTER # 44
Stormwater Management Plan / Ordinance	X	4/12/04		LTL – TOWNSHIP ENG’R	AMENDED 4/12/2004
Natural Resource Protection Plan	X	4/12/04		LTL – TOWNSHIP ENG’R	
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	X	10/9/18		BCO	2015 IBC
Fire Code	X	10/9/18		FIRE MARSHAL, BCO	2015 IFC
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		TOWNSHIP PLANNING COMM.	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		TOWNSHIP ENGINEERS LTL CONSULTANTS	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		TOWNSHIP ENGINEERS	
Emergency Manager	X		EMC	
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants	X		TOWNSHIP MANAGER	
Staff with expertise or training in benefit-cost analysis	X		TOWNSHIP MANAGER	
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		TOWNSHIP MANAGER	
Community Development Block Grants (CDBG)	X		TOWNSHIP MANAGER	
Special Purpose Taxes	X		TOWNSHIP MANAGER	
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees	X		BOARD OF SUPERVISORS	
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X		TOWNSHIP EMC/MANAGER	
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		TOWNSHIP FIRE MARSHAL	
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		TOWNSHIP EMC	
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: NORTH COVENTRY TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	No	
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	Refer to FEMA
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.		If and when applicable.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		Zoning Office for all of the below
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	Through Floodplain Management Ordinance

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County				X		Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan			X			Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters		X				Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains		X				<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities		X				Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				X		Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					Has this activity been integrated into the municipality's normal operations?
F-14. Install stream gauges if an additional area is identified to benefit from one	X					Has this activity been integrated into the municipality's normal operations?
F-15. Provide education to the municipalities on flood gauges	X					Has this activity been integrated into the municipality's normal operations?
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency				X		<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering			X			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events		X				<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			X			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage	X					Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages				X		Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster		X				Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						

=Hazard Identification and Risk Evaluation Worksheet

Name: Mary Higgins and Robert Ketcham

Title: Borough Council Members

Jurisdiction: Oxford Borough

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	Increased	More severe
Tornado and Windstorm	Increased	More Severe
Winter Storm	Decreased	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance		
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	Increase	Storm severity caused outages
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County's hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: OxfordBorough Point of Contact Name and Title: Mary Higgins, Councilwoman _____
 Phone: 610-470-6869 E-mail: mhiggins@oxfordboro.org

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	2016		Chesco EMA	
Emergency Operations Plan	X	April 2020		EMC	
Disaster Recovery Plan	X	April 2020		EMC	
Evacuation Plan	X	April 2020		EMC	
Continuity of Operations Plan					Need to develop
NFIP					
NFIP – Community Rating System	X				Currently maintained by David Sweet and John Schaible
Floodplain Regulations (spec. NFIP)					



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	x			Codes Department Oxford Borough	Ongoing
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)				ORPC/Borough	Update to begin in 2021
Open Space Management Plan (or Parks/Rec or Greenways Plan)					None
Stormwater Management Plan / Ordinance			X	Chester CO	Permit not issued for MS4 Plan
Natural Resource Protection Plan					
Capital Improvement Plan			X		Finance Committee of the Borough
Economic Development Plan	X	2015		OMI-BID and HARB	Needs to be updated
Historic Preservation Plan					HARB needs to weigh in on development
Farmland Preservation					
Building Code		ongoing			
Fire Code					Need to check NFPA and make sure are in compliance with it. If not consider adoption.
Other					



2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “x” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)				We do hire on a contractual basis engineers to serve this role
Planners or engineers (with natural and/or human caused hazards knowledge)				Need to review and update.
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)				
Emergency Manager			Oxford Borough EMC	John Reynolds
NFIP Floodplain Administrator				
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program	X		GIS Mapping	
Grant writers or fiscal staff to handle large or complex grants	X			Pauline Garcia-Allen
Staff with expertise or training in benefit-cost analysis				Need to review
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources **for hazard mitigation purposes** (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		In review
Community Development Block Grants (CDBG)	X			
Special Purpose Taxes		X		
Gas / Electric Utility Fees		x		
Water / Sewer Fees	X			Oxford Water Company
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		Educational program- review
StormReady certification		X		Need to pursue for certification
Natural disaster or safety related school programs				Don't know
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X			Governmental and private
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Financial Capability		X	
Education and Outreach			X

Mitigation Action Plan Review Worksheet- Oxford Borough

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status				Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	
Public Information Programs for Oxford Borough			X		
Emergency alerting systems for Oxford Borough					Ready Chesco

Mitigation Action Worksheet

Municipality(ies):	Action
Oxford Borough	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8 th Street.
Action Number:	
<i>Location (address, lat/long)</i>	39.782153, -75.967946
<i>Mitigation Technique Category</i>	Natural Systems Protection (NSP)
<i>Hazard(s) Addressed</i>	Storm water
<i>Priority (High, Medium, Low)</i>	
<i>Estimated Cost</i>	\$50,000
<i>Potential Funding Streams</i>	Grants and/or general fund revenues
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Arlene Harrison
<i>Title</i>	Interim Borough Manager
<i>Agency/Department</i>	Oxford Borough
<i>Phone</i>	610-932-2500, ext. 1302
<i>E-mail</i>	treasurer@oxfordboro.org

Hazard Identification and Risk Evaluation Worksheet

Name: Neil D. Vaughn

Title: Borough Manager

Jurisdiction: Parkesburg Borough

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	
Tornado and Windstorm	NC	
Winter Storm	I	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	
Fires	I	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	I	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input checked="" type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: PARKESBURG BOROUGH

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	Online versions
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	2017
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	Borough Engineer will review updates when submitted.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	*	We have not been in this situation. We will work with any required agency as needed if it does arise.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Working with Borough Engineer and Flood Plain Data on-site.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Borough Administration

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Borough Administration / Engineer
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Borough Administration / Engineer
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Borough Administration / Engineer
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Borough Administration / Engineer
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Through Normal Enforcement MEans

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	These uses are not permitted within the Floodplain District.

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Neil D. Vaughn

Title: Borough Manager

Jurisdiction: Parkesburg Borough

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
<ul style="list-style-type: none"> Do the goals, objectives, and actions address current and expected conditions? Yes, municipalities are responsible for the health, safety and welfare of their citizens. Should each goal be carried forward into the updated plan? Yes Should a goal be changed based on current conditions in the community? No Should a goal be discontinued, and if so, why? No What is the status of each action? Ongoing What progress has been made? Preventative inspections, maintenance, public information, and updating ordinances / plans Should an action be continued in the updated plan? Yes Should an action be discontinued, and if so, why? No Has the nature or magnitude of hazard risk changed? No Are current resources adequate to implement the plan? Within reason, yes. Always could use more. Should additional local resources be committed to address identified hazard threats? It should be the responsibility of everyone to work on this. Are there any issues that have limited the current implementation schedule? No Have the implementation of identified mitigation actions resulted in expected outcomes? Unable to determine. Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided? No Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed? Yes Are there other concerns that should be identified? No 		ew

Goal 2	Reduce personal and property disaster losses
<ul style="list-style-type: none"> • Do the goals, objectives, and actions address current and expected conditions? Yes • Should each goal be carried forward into the updated plan? Yes Should a goal be changed based on current conditions in the community? No Should a goal be discontinued, and if so, why? No • What is the status of each action? Ongoing progress; same as #1 What progress has been made? Should an action be continued in the updated plan? Preventative inspections, maintenance, public information, and updating ordinances / plans Should an action be discontinued, and if so, why? No • Has the nature or magnitude of hazard risk changed? No • Are current resources adequate to implement the plan? Within reason, yes. Always could use more. • Should additional local resources be committed to address identified hazard threats? It should be the responsibility of everyone to work on this. • Are there any issues that have limited the current implementation schedule? No • Have the implementation of identified mitigation actions resulted in expected outcomes? Unable to determine. • Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided? No • Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed? Yes, and is still ongoing • Are there other concerns that should be identified? No 	

Goal 3	Increase disaster resilience of public and private infrastructure
<ul style="list-style-type: none"> • Do the goals, objectives, and actions address current and expected conditions? Somewhat • Should each goal be carried forward into the updated plan? Yes Should a goal be changed based on current conditions in the community? No Should a goal be discontinued, and if so, why? No • What is the status of each action? Ongoing What progress has been made? Plan reviews, inspections Should an action be continued in the updated plan? Yes Should an action be discontinued, and if so, why? No • Has the nature or magnitude of hazard risk changed? No • Are current resources adequate to implement the plan? Within Reason • Should additional local resources be committed to address identified hazard threats? No • Are there any issues that have limited the current implementation schedule? No • Have the implementation of identified mitigation actions resulted in expected outcomes? Unable to determine. • Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided? No • Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed? Yes • Are there other concerns that should be identified? No 	

Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards
All answers will be the same as Goal #3	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures
<ul style="list-style-type: none"> • Do the goals, objectives, and actions address current and expected conditions? Yes • Should each goal be carried forward into the updated plan? Yes Should a goal be changed based on current conditions in the community? No Should a goal be discontinued, and if so, why? No • What is the status of each action? Ongoing What progress has been made? Ongoing Should an action be continued in the updated plan? Yes Should an action be discontinued, and if so, why? No • Has the nature or magnitude of hazard risk changed? No • Are current resources adequate to implement the plan? Yes • Should additional local resources be committed to address identified hazard threats? No • Are there any issues that have limited the current implementation schedule? No as it is ongoing • Have the implementation of identified mitigation actions resulted in expected outcomes? Unable to determine. • Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided? No • Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed? Yes • Are there other concerns that should be identified? No 	

Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community
<ul style="list-style-type: none"> • Do the goals, objectives, and actions address current and expected conditions? Yes • Should each goal be carried forward into the updated plan? Yes Should a goal be changed based on current conditions in the community? No Should a goal be discontinued, and if so, why? No • What is the status of each action? Ongoing What progress has been made? Ongoing PR Should an action be continued in the updated plan? Yes Should an action be discontinued, and if so, why? No • Has the nature or magnitude of hazard risk changed? No • Are current resources adequate to implement the plan? Yes • Should additional local resources be committed to address identified hazard threats? No • Are there any issues that have limited the current implementation schedule? No • Have the implementation of identified mitigation actions resulted in expected outcomes? Unable to determine. • Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided? No. • Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed? Yes • Are there other concerns that should be identified? No 	

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			Has this activity been integrated into the municipality’s normal operations? Yes
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					Unknown
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			Has this activity been integrated into the municipality’s normal operations? Yes
AH-4. Provide regular updates to the countywide Mass Care Plan			X			Has this activity been integrated into the municipality’s normal operations? Yes
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations? Yes

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents		X				Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Haven't heard from them on a local level.
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	X					
AH-11. Enhance the communications equipment between the County and the municipalities			X			
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						N/A
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						N/A
AH-15. Implement a system to report blocked/closed roads				X		
FC-16. Provide education to the municipalities on resident evacuation processes and need	X					
AH-17. Provide education to the municipalities on tracking road closures	X					
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities						N/A

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	X					
TS-2. Sustain tree management programs around power lines						Not our responsibility
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						N/A
F-2. Educate county residents on the NFIP following flood events	X					Has this activity been integrated into the municipality's normal operations? No
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			Has this activity been integrated into the municipality's normal operations? Yes
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations? yes

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)			X	X		
F-9. Manage integrity and functions of existing regional flood control facilities						N/A
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						N/A
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges						N/A
F-13. Continue to maintain the stream gauges within the County						N/A
F-14. Install stream gauges if an additional area is identified to benefit from one						N/A
F-15. Provide education to the municipalities on flood gauges	X					Has this activity been integrated into the municipality's normal operations?
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate		X				
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs		X	X			
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows		X	X			
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents		X				
WS-3. Improve storm drains throughout the County to handle snow melt	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency		X	X			Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris		X	X			Has this activity been integrated into the municipality's normal operations?
TOR-2. Develop a countywide Debris Management Plan			X			
TOR-3. Provide public information on debris management			X			Has this activity been integrated into the municipality's normal operations?
TOR-4. Retrofit critical public facilities with safe rooms	X					Has this activity been integrated into the municipality's normal operations?
D-1. Provide public information on the effects of droughts on public and private wells	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-2. Promote sustainability programs and green practices throughout the County	X					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						N/A
PG-1. Encourage security check of bags/coolers at public gathering	X					Has this activity been integrated into the municipality's normal operations?
PG-2. Plan for and implement strengthened security at public events		X	X			Has this activity been integrated into the municipality's normal operations?
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-6. Purchase temporary mobile camera to set up for events	X					Has this activity been integrated into the municipality's normal operations? No
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					Has this activity been integrated into the municipality's normal operations? No
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					Has this activity been integrated into the municipality's normal operations?
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	X					
PG-10. Increase advanced planning through use of the incident action plan process		X	X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Amtrak is horrible. Get a rep in my town now!
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage		X	X			Has this activity been integrated into the municipality's normal operations? Yes

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events		X				
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)		X				Has this activity been integrated into the municipality's normal operations? Yes
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						No Billboards in the Borough
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction		X				Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws		X	X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources	X					
IL-4. Plan for replenishment fuel for generators		X	X			
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site		X	X			
IL-6. Continue to engage the private sector to become involved in emergency preparedness		X	X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts		X	X			

Mitigation Action Plan Review Worksheet- Parkesburg Borough

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Parkesburg Borough			X			Via Social Media, Borough Website, and Emergency Management Partners
Emergency alerting systems for Parkesburg Borough				X		ReadyChesco
Purchase generator for traffic lights at Rt 10 and Rt 372				X		
Purchase and install backup generator at Keystone Valley Fire Department (329 W 1st Ave)				X		
Re-engineer and re-build the bridge to be able to support traffic at Bridge St Amtrak Bridge		X				West Bridge Street – 2021 Project Start
Purchase debris removal equipment (chainsaws, front end loaders, etc) for the Borough				X		
Provide training to public works crew on operation of debris removal equipment for the Borough			X			Ongoing

Hazard Identification and Risk Evaluation Worksheet

Name: Chuck Freese Title: EMC

Jurisdiction: Penn Twp.

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	D	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	D	
Nuclear Incidents	D	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Hazard Identification and Risk Evaluation Worksheet

Name: Michael Hochhaus Title: EMC

Jurisdiction: Pennsbury Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input checked="" type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: ___Pennsbury Township___ Point of Contact Name and Title: Michael J Hochhaus, EMC

Phone: 610-299-5976 E-mail: _mhochhaus@verizon.net

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	1/1/2021		County EMA HMP	Providing updated Township data to CCDES
Emergency Operations Plan	X	1/1/2020		Pennsbury EMC	Reviewed annually
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Floodplain Management Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Zoning Regulations	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Subdivision Regulations	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Stormwater Management Plan / Ordinance	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Natural Resource Protection Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Capital Improvement Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Economic Development Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Historic Preservation Plan	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Farmland Preservation	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Building Code	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Fire Code	X	1/1/2020		Pennsbury Township Board of Supervisors	Reviewed annually
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X			
Planners or engineers (with natural and/or human caused hazards knowledge)	X			
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			
Emergency Manager	X			
NFIP Floodplain Administrator	X			
Land Surveyors				
Scientists or staff familiar with the hazards of the community				
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis	X			
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Pennsbury Township Board of Supervisors	Reviewed annually
Community Development Block Grants (CDBG)				
Special Purpose Taxes	X		Pennsbury Township Board of Supervisors	Reviewed annually
Gas / Electric Utility Fees				
Water / Sewer Fees				
Stormwater Utility Fees				
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds				
Partnering Arrangements or Intergovernmental Agreements				
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Financial Capability			X
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: PENNSBURY TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: _____ Title: _____ Jurisdiction: _____

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County						<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction						<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-4. Provide regular updates to the countywide Mass Care Plan						<i>Has this activity been integrated into the municipality’s normal operations?</i>
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County						
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community						
AH-7. Promote and provide emergency management training opportunities						<i>Has this activity been integrated into the municipality’s normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents						<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division						<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters						<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-11. Enhance the communications equipment between the County and the municipalities						
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities						<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						
F-6. Follow state and County stormwater regulations						
F-7. Enforce floodplain management ordinances						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-8. Implement the Act 167 Plan (Stormwater management)						
F-9. Manage integrity and functions of existing regional flood control facilities						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-12. Continue to maintain the stream gauges						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas						<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management						<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms						<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells						<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering						<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process						<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure						<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage						<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)						<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction						Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County						Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations						Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws						
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



Mitigation Action Plan Review Worksheet- Pennsbury Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Pennsbury Township			X			Web page and quarterly news letter
Emergency alerting systems for Pennsbury Township			X			Webeoc, readychesco,chescoalert
Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek	X					
Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd	X					



**Chester County Department of Emergency Services
Hazard Mitigation Meeting with Phoenixville Public Works and Emergency Management
Departments**

February 7, 2020

10:00 am –11:00 am

Borough of Phoenixville Borough Office

Mitigation Subjects	Actions/Comments/Notes
<p>1. Local Plans and Regulations</p>	<ul style="list-style-type: none"> • Active Shade Tree Commission has (1) tree maintenance program that takes care of trimming trees within the public ROW and (2) tree replacement program which will remove dead/dying/hazardous trees and replace them with new trees that are better suited for the location. • Compliance with MS4. They are getting ready to implement a SWIF sometime in the future, but that is still in the works. Storm Water Ordinance is from (2014). • Building on floodplain is prohibited. When reviewing development, they ensure that the developer is accounting for storm water drainage and runoff. This is not a large issue, mostly because of the locations chosen to develop, and because they can easily discharge into either Schuylkill River or French Creek. French Creek rarely is at capacity, so run-off usually is not an issue. • Progressive planning initiatives that allow for development while mitigating risk of damage or loss of life and property (For example, first floor of high-density housing is a parking garage). **
<p>2. Infrastructure Improvements</p>	<ul style="list-style-type: none"> • Aging infrastructure is one of the biggest challenges within Public Works. They have received assistance in the form of CDBG grants from the County. Director of Public Works relies on superintendents of water, storm water, streets, wastewater, etc. to inform capital improvement plans. The Borough strives to place a 10 year lifecycle on equipment and to regularly replace as necessary. • Mitigation Actions: Raising of the flood wall by a couple feet was completed, as well as getting back-up power supplies for traffic control lights (either through connection to generator feeds or batteries). These projects are complete, and the Borough believes that (save for other infrastructural endeavors like fixing/replacing aging water lines with assistance of CDBG through County), the mitigation actions and strategies they will focus on is public outreach initiatives and organizing/training a solid volunteer base. Through the water line restoration, they have seen a reduction in water main breaks. There is one point of consistent flooding at the intersection of Bridge and Church. They have a storm arch that is failing and leads to French Creek, but it would be incredibly costly and destructive as it sits under buildings and goes through several

	<p>properties.</p> <ul style="list-style-type: none"> • Water plant will be procuring a new generator to ensure that in the event of a power failure, they can still function until power is restored. • If they are anticipating a severe storm, the Public Works department vacuums storm water culverts/drains to remove leaves, debris so that run-off flows more freely.
<p>3. Natural Systems Protection</p>	<ul style="list-style-type: none"> • One of the most common forms of this is riparian buffers/stream restoration. I don't believe that this applies to Phoenixville. • Removal of Tree of Life plants to mitigate spotted lantern fly infestation out of public property as well as asking homeowners to do the same.
<p>4. Education and Awareness Programs</p>	<ul style="list-style-type: none"> • Robust history of public outreach including with the school district and community organizations, senior citizens facilities, Good Samaritan Shelter. Director of Emergency Management encourages training for volunteer groups and Public Works so that these groups are ready and confident immediately after an emergency incident. • Use of social media and Public Information Forums covering wide array of topics to keep citizens informed. This is a collective effort between all agencies (Supervisors, administration, and other boards within the Borough). • Narcan disbursement. Police along with Mayor have an opioid awareness campaign. The number of overdoses seems to have decreased, while other drugs may be on the rise. • Emergency Management Booth at First Fridays with information for public. • Participation with Montgomery County Dept. of Emergency Services as well as Chester County Emergency Services in trainings and exercises.
<p>Other notes:</p>	<p>Good working relationship with PECO so that response is fast and effective when they do lose power. The primary pump station which supplies 80% of their customer base does have a back-up generator as do all of the waste water plants. The other two pump stations rely on one power source.</p> <p>Good working relationship with neighboring municipalities to ensure that recovery is fast and community resiliency is strong. Established regional emergency management organization in conjunction with Montco municipalities to maintain and building (cross-train as well) staff knowledge, cohesion, and list of resources.</p> <p>Having a dedicated person to Emergency Management has had a great number of positive impacts on the community.</p>

***This was from a previous conversation with Karin Williams from the Debris Tabletop.**

****This piece was from Tony**

Municipality: Pocopson

Name of Representative from Municipality: Kevin Gosselin, Pocopson Township

Date: 11/23/20

Time: 2:40pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

Hazard pretty stable. No change. Flooding and power outages during extreme weather events.

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Last two years, state rebuilt bridge on 926 and Creek Road. Thus improving the flooding problems.

Flooding around Brandywine Creek on Northbrook Road (one lane bridge), historical bridge

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

No change-

4. What updates do you have to your planning and administrative capabilities since 2015? No Change

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology-

Water Sewer Authority-

Capital Improvement Plans- Not sure

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Test

Mitigation Action Worksheet

Municipality(ies):	Action
Pocopson Township, PA	<u>West Creek Road Project</u> Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding.
Action Number:	
Location (address, lat/long)	
	608 W Creek Rd, (Pocopson Township), West Chester, 19382 (39.91411 N, 75.63548 W)
Mitigation Technique Category	
	Lessen impacts on natural resources and open space from natural and human-caused hazards.
Hazard(s) Addressed	Transportation Accidents; Flood, Flash Flood, and Ice Dams
Priority (High, Medium, Low)	High
Estimated Cost	\$500,000
Potential Funding Streams	2021 Pocopson Township budget
Timeline	June 1, 2021 through December 31, 2021
Lead Agency/Department	Pocopson Township Public Works Department
Support Agency(ies)/ Department(s)	Gilmore and Associates 119 East Linden Street Kennett Square, PA 19348 P: 610.444.9006; Fax: 610.444.7292
Project Point of Contact	
Name	Mark Knightly
Title	Public Works Director
Agency/Department	Pocopson Township Public Works Department
Phone	610-793-2387
E-mail	publicworks@pocopson.org

Mitigation Technique Category

- Local Plans and Regulations (LPR) – These actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP) – These actions involve (1) modifying existing structures and infrastructure to protect them from a hazard, or (2) removing them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also includes projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.

Costs:

If an estimated cost is known, please provide or use the following ranges:

Low = < \$10,000

Medium = \$10,000 to \$100,000

High = > \$100,000

If costs have not been estimated, please use the following categories:

<i>Low</i>	Possible to fund under existing budget. Project is part of, or can be part of, an existing on-going program.
<i>Medium</i>	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
<i>High</i>	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

Timeline:

Short = 1 to 5 years

Long-Term = 5 years or greater

OG = On-going program

DOF = Depending on funding

Municipality: Sadsbury Township

Name of Representative from Municipality: Earl Taylor, Jr. Township EMC

Date: 11/23/2020

Time: 0205 PM

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

Flooding has increased in certain areas

Civil unrest- no change

Haz Material, no change even with rt 30

Problem with railroad not taking care of trees in the past, and during thunderstorms sometimes that impacts the wires.

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Greenbelt Drive: culvert and water , 100' up from that runs into flooding issues

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

- Ongoing for public information and emergency alerting systems
- No change with Greenbelt
- No change with Old Mill Road
- Pump station no longer owned by Sadsbury Township, American Water
- Washington Lane has been completed by Valley Township, stops up by Waverly Blvd.
- Manholes now belong to PA water
- Road Crew often will go out and inspect culverts and try to mitigate problems before storms.

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology-

Water Sewer Authority-

Capital Improvement Plans-

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Testing- unsure

Hazard Identification and Risk Evaluation Worksheet

Name: E.J. Mentry Title: Township Manager

Jurisdiction: SCHUYLKILL TOWNSHIP

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	Increase in flooding/flash flooding, including new areas with no previous flooding history
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	See above (flooding)
Tornado and Windstorm	I	Derecho in June 2020, excessive power outage, tree damage, property damage
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Dam Breaches	NC	Concern regarding the age of the dam and vulnerability to breaches
Extended Utility, Data, or Telecomm Disruptions	I	Due to storms
Fires	NC	
Hazard Material Releases	NC	Concern regarding Norfolk Southern hauling crude oil through the Township on a daily basis
Nuclear Incidents	NC	Township is part of Limerick Generating Station 10-mile Plan
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input checked="" type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Schuylkill Township

1. FLOODPLAIN IDENTIFICATION AND MAPPING

Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	2012
c. Does the municipality support requests for map updates?	If yes, specify how.	YES	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	newsletter articles
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.		
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	

Schuylkill Township**Background Information**

The township is 8.9 square miles in area. The 2010 Census counted 8,516 people within the municipality.

Buildings in the 1% (100 year) and 0.2% (500 year) chance floodplain

Total	1% Annual flood chance			0.2% Annual flood chance			
Parcel Count	Building Count	Parcel Count	Building Count	Structure Value	Parcel Count	Building Count	Structure Value
3,154	4,368	30	74	\$20,721,490	7	18	\$6,237,800

Utility Providers

Electric	Natural Gas	Water
PECO	PECO	Aqua America, Inc.

Capabilities

Planning and Regulatory Capabilities		Administrative and Technical Capabilities	
Building Code	IBC	Emergency Management Coordinator	✓
Capital Improvement Plan		Engineer on Staff or Contracted	✓
Comprehensive Plan (Last Updated)	10/3/2007	Environmental Preservation Committee	✓
Emergency Operations Plan	✓	GIS Capabilities on Staff or Contracted	✓
Floodplain Ordinance	✓	Historical Preservation Committee	✓
NFIP Participant	✓	Municipal Planning Commission	✓
Stormwater Management Ordinance	✓	Municipal Road Crew	✓
Subdivision or Land Development Ordinance (Last Updated)	12/7/2011	Municipal Sewer Authority	
Zoning Ordinance (Last Updated)	9/5/2012	Municipal Water Authority	
Restrictions on building in the floodplain	Building prohibited	Municipal Zoning Board	✓
		Require Radon Testing during real estate transaction	

These capabilities are in addition to the countywide capabilities outlined in the capability section of the plan.

Emergency Services Providers

	Agency(ies)
ALS	West End Fire Company
BLS	West End Fire Company
Fire	Valley Forge Fire Company
Police	Schuylkill Township Police Department

Mitigation Strategy 5-Year Mitigation Plan Review

Name: E.J. MENTRY

Title: TOWNSHIP MANAGER

Jurisdiction: SCHUYLKILL TOWNSHIP

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
		We agree with this goal
Goal 2	Reduce personal and property disaster losses	
		We agree with this goal
Goal 3	Increase disaster resilience of public and private infrastructure	
		We agree with this goal



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
		We agree with this goal
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
		We agree with this goal
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
		We agree with this goal



Suggested Additional Goals and/or Objectives		Comments
Goal	Increase communication/coordination among all emergency response agencies within the County	
Objective		
Objective		
Objective		
Goal	Improve stormwater management and flood mitigation efforts	
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		

Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						N/A
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan	X					Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities			X			
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						N/A
AH-13. Continue infrastructure improvements through community development	X					
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						N/A
AH-15. Implement a system to report blocked/closed roads			X			
FC-16. Provide education to the municipalities on resident evacuation processes and need						N/A
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities			X			Has this activity been integrated into the municipality's normal operations?
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						N/A
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes						N/A
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						N/A
TS-2. Sustain tree management programs around power lines			X			
TS-3. Encourage new development planning to include burying of utility cables				X		
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County	X					
F-2. Educate county residents on the NFIP following flood events	X					Has this activity been integrated into the municipality's normal operations?
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps						N/A
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)			X	X		
F-9. Manage integrity and functions of existing regional flood control facilities			X			Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams			X			
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				X		Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					Has this activity been integrated into the municipality's normal operations?
F-14. Install stream gauges if an additional area is identified to benefit from one	X					Has this activity been integrated into the municipality's normal operations?
F-15. Provide education to the municipalities on flood gauges	X					Has this activity been integrated into the municipality's normal operations?
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					Township uses portable barricades
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					Unknown
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs			X	X		
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						N/A – County action
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows				X		Part of our MS4

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X			
WS-3. Improve storm drains throughout the County to handle snow melt			X			
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			X			Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						N/A
TOR-3. Provide public information on debris management			X			Has this activity been integrated into the municipality's normal operations?
TOR-4. Retrofit critical public facilities with safe rooms	X					Has this activity been integrated into the municipality's normal operations?
D-1. Provide public information on the effects of droughts on public and private wells			X			Has this activity been integrated into the municipality's normal operations?
D-2. Promote sustainability programs and green practices throughout the County			X			
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					Has this activity been integrated into the municipality's normal operations?
PG-1. Encourage security check of bags/coolers at public gathering		X				Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events			X			Has this activity been integrated into the municipality's normal operations?
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events			X			
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					Has this activity been integrated into the municipality's normal operations?
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					Has this activity been integrated into the municipality's normal operations?
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure		X				Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)				X		Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction			X			Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			X			Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					Unknown
IL-3. Purchase backup generators for critical infrastructure/key resources				X		
IL-4. Plan for replenishment fuel for generators				X		
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					Unknown

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						N/A



Mitigation Action Plan Review Worksheet- Schuylkill Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Schuylkill Township			X			
Emergency altering systems for Schuylkill Township			X			Chester County reverse 911, Township Facebook, website, and mass email
Acquisition/Elevation of the structure located at 493 State Creek Road	X					This address does not exist. Assuming this is the Creek Road Bridge, this is an ongoing County project, not a Township project
Obtain generator for traffic signal at Rt 23 and Whitehorse Rd				X		
Obtain generator for traffic signal at Rt 23 and Pawling Rd				X		
Obtain generator for traffic signal at Rt 23 and County Club Rd				X		
Obtain generator for traffic signal at County Club Rd and Valley Park Rd				X		
Construct Larger Culvert at S Whitehorse Road	X					Waiting on PennDOT
Protect Structure with Barrier at Creek Road Bridge	X					Unknown
Construct Larger Culvert at East Phillip Drive	X					Unknown

Municipality: Schuylkill Township

Name of Representative from Municipality: Moujan Toloubadei

Date: 10/15/2020

Time: 12:54 PM

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No real change, flooding still an issue but a secondary hazard they have seen an increase in power outage frequency/duration.

Utility outages has been increasing, especially in 2020

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Township working on grants for RT 23 and State Creek road (mitigation action).

Storm water management is a concern, more houses are being flooded in particular communities

3. Go through their specific mitigation actions to see if there are completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Projects still in progress but traffic signals seem to be on generators so those are complete. Others are ongoing.

4. Planning Updates (EOPs, SALDO, Zoning, NFIP, etc.)?

Plans updated regularly plans, township leadership is proactive with keeping plans and capabilities up to date.

EOP-

SALDO-

Zoning-

NFIP Ordinance-

Building Codes-

One area of improvement/concern also with volunteer retention for EOC/EMA activities.

South Coventry Township

Amanda Shaner, Township Administrator/EMC, 1/21/21 @ 3:30pm.

Hazards:

No change, consistent with County plan

Capabilities:

Portion of township is still provided water
Update to Comp Plan around 2015

Traffic signal at Coventryville Rd and 23 – Installation of traffic light with PennDOT grant application.

Mitigation Actions:

Closed bridge- construct larger culvert – no progress keep on list

Woodridge Sewer Plant- Other Capital improvements have been prioritized over generator; keep on list.

Schoolhouse Rd- pipe under school house road. **Hoping to do swale for flooding in that area.**

Coventryville Rd-

Young Rd- Replacement to pipe under has helped. These signage items can be removed.

Coventryville Rd & Harmonyville Road (close to North Cov. Border) some downhill flooding issues on hill there the township would like to do something with.

Hazard Identification and Risk Evaluation Worksheet

Name: Judy Lizza

Title: Twp. Manager

Jurisdiction: Thornbury Twp

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	I	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	I	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	I	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	D	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|---|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input checked="" type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input checked="" type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input checked="" type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Thornbury Twp.
 Phone: 610-399-1425

Point of Contact Name and Title: Judy Lizza, Twp. Manager
 E-mail: jlizza@thornburytwp.com

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	updated 2015	X	Twp	needs updating supports
Emergency Operations Plan	X	↓		Twp.	supports
Disaster Recovery Plan	X	↓		Twp	supports
Evacuation Plan	X	↓		Twp.	neutral
Continuity of Operations Plan	X	↓		Twp.	neutral
NFIP	X	2013		Twp/Engineer	supports
NFIP – Community Rating System	X	2013		Twp	supports
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	6/2017		Twp/Engineer/codes	- supports
Floodplain Management Plan	X	6/2014		Twp/Engineer	- supports
Zoning Regulations	X	1983	X	Twp/Engineer	updating now - supports

with amendments



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	1983		Twp/Eng	Supports
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	5-13-2018		Twp/Planning Commission(PC)	neutral
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X			Twp/Planning Com.	supports
Stormwater Management Plan / Ordinance	X	2014		Twp/Eng./Codes	supports
Natural Resource Protection Plan	X			Twp/PC	supports
Capital Improvement Plan	X	2019		Twp	neutral
Economic Development Plan	N/A	-		-	N/A
Historic Preservation Plan	X	2009		Twp/Historic Commission	neutral
Farmland Preservation	N/A	-		-	N/A
Building Code	X	1999 UCC		Twp/Codes	supports
Fire Code	X	1999		twp/Codes/Fire Marshal	supports
Other					

2. **Administrative and Technical Capability:** Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an "X" in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		contracted
Planners or engineers (with natural and/or human caused hazards knowledge)		X		↓
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		X		
Emergency Manager	X		Twp. Mgr.	
NFIP Floodplain Administrator		X		contracted
Land Surveyors		X		↓
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA's HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants	X		Twp.	
Staff with expertise or training in benefit-cost analysis		X		
Other				contracted

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Twp. Mgr	
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds	X		Twp.	
Partnering Arrangements or Intergovernmental Agreements	X		Twp.	
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs	X			Concept School does this programming
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X			newsletter, email blasts
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X	X		some HOA's are active in disseminating information
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability		X	
Financial Capability	X		
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Thornbury Township

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	yes	Have NFIPs send copies to the local library
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	yes	6/2017
c. Does the municipality support requests for map updates?	If yes, specify how.	no	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	no	would if any request is made
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	no	- recommend to hire engineer for report to dispute boundary
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	yes	but have none to date

2. FLOODPLAIN MANAGEMENT

Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	yes	but permitting is not allowed w/o stringent requirements; no applications to date
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	yes	township engineer
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	yes	township engineer
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	yes	codes office/ twp. records
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	yes	review all activities, expansions, bldgs through zoning permit; engineering reviews and property inspections during construction.



2. FLOODPLAIN MANAGEMENT

Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	yes	# all those are included in the existing ordinance

3. FLOOD INSURANCE

Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	no	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	no	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	yes	have maps available; address questions



Mitigation Strategy 5-Year Mitigation Plan Review

Name: Judy Lizza Title: Township Manager Jurisdiction: Thornbury Twp.

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
<i>None</i>		
Goal 2	Reduce personal and property disaster losses	
<i>None</i>		
Goal 3	Increase disaster resilience of public and private infrastructure	
<i>None</i>		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
<i>None</i>		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
<i>None</i>		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
<i>Difficult to measure success</i>		

Suggested Additional Goals and/or Objectives		Comments
Goal		<i>None</i>
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		

Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones			X			
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			
AH-4. Provide regular updates to the countywide Mass Care Plan			X			
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			
AH-8. Arrange and hold hazard mitigation workshops for county residents			X			
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			
AH-11. Enhance the communications equipment between the County and the municipalities			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery		?				would this be protected or open to public
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads				X		
FC-16. Provide education to the municipalities on resident evacuation processes and need	?					better to educate to get more residents to sign up
AH-17. Provide education to the municipalities on tracking road closures	?					Ready Chesco that will give pertinent info.
AH-18. Promote awareness of mental health services and resources throughout all the facilities within the County to include schools, workplaces, and healthcare facilities		X				
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders			unknown			
AH-20. Provide public information surrounding Radon hazard				X	the	~ has been addressed
AH-21. Encourage municipalities to require radon testing at the time sale of homes				X	the	
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	?				.	



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines		?				<i>mgmt. program by PECO what @ communicada lines?</i>
TS-3. Encourage new development planning to include burying of utility cables				X		
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County				X		
F-2. Educate county residents on the NFIP following flood events				X		
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains				X		
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads				X		
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps				X		
F-6. Follow state and County stormwater regulations				X		
F-7. Enforce floodplain management ordinances				X		
F-8. Implement the Act 167 Plan (Stormwater management)				X		
F-9. Manage integrity and functions of existing regional flood control facilities				X		
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams				X		
F-11. Develop and implement a model natural conservation ordinance for municipal adoption				X		



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-12. Continue to maintain the stream gauges			X			
F-13. Continue to maintain the stream gauges within the County			X			
F-14. Install stream gauges if an additional area is identified to benefit from one	?					
F-15. Provide education to the municipalities on flood gauges				X		
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	?					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	?					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate				X		
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs				X		
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	?					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows				X		
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired				X		

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS-1. Provide public information on utility outages and the need to prepare for storms			X	X		
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X	X		
WS-3. Improve storm drains throughout the County to handle snow melt			X	X		
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas			X	X		
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency	?			\		
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X	X		
TOR-2. Develop a countywide Debris Management Plan	?					
TOR-3. Provide public information on debris management	?					
TOR-4. Retrofit critical public facilities with safe rooms	?					
D-1. Provide public information on the effects of droughts on public and private wells	?					
D-2. Promote sustainability programs and green practices throughout the County			X	X		

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs			X	X		
PG-1. Encourage security check of bags/coolers at public gathering			X	X		
PG-2. Plan for and implement strengthened security at public events			X			
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events			X			
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation			X			
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens			X			
PG-6. Purchase temporary mobile camera to set up for events	?		X			
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	?					
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			X			
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			
PG-10. Increase advanced planning through use of the incident action plan process			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure			X			
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages			X			
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster			X			
TRF-7. Provide public education on traffic accident reduction	?					
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			X	X		
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X	X		
TRF-10. Enforcement of traffic laws			X	X		
IL-1. Provide private sector education/outreach related to cyber security best practices			X			
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-3. Purchase backup generators for critical infrastructure/key resources	?					
IL-4. Plan for replenishment fuel for generators			X			
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site			X			
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts			X			

Mitigation Action Plan Review Worksheet- Thornbury Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Thornbury Township			x			
Emergency alerting systems for Thornbury Township			x			
Obtain generator for EOC/Township Office (8 Township Drive)		x				
Obtain generator for traffic signal at Rt 202 and Rt 926				x		
Obtain generator for traffic signal at Rt 202 and Green Tree Dr				x		
Obtain generator for traffic signal at Rt 926 and Westtown-Thorton Rd				x		
Obtain generator for traffic signal at Rt 926 and New St				x		
Obtain generator for traffic signal at Rt 926 and S. Westtown Rd				x		
Install gates to be closed during flood incidents and signage at Rt 926 and Creek Rd	x					State owned road
Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd	x					State owned road
Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge	x					State owned road
Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd north of Railroad Bridge	x					State owned road
Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd	x					State owned road

Mitigation Strategy 5-Year Mitigation Plan Review

<i>Existing Mitigation Action</i>	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Assessment of flood prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd	x					<i>State owned road</i>



Please provide the following information for the update of actions and initiatives for your mitigation strategy. Suggested actions have been developed based on an analysis of Chester County's needs and capabilities or were carried over from the previous hazard mitigation plan (HMP) update. If questions do not apply to your municipality, please indicate with N/A.

Hazards being profiled in the HMP are dam failure, drought and water supply deficiencies, earthquake, environmental hazards (hazardous materials releases), extreme temperatures, flood, flash flood, and ice jams, hurricanes and tropical storms, invasive species, nuclear incident, opioid addiction response, pandemic and infectious disease, environmental hazard gas and liquid pipelines, radon exposure, structural fires, terrorism, tornado and windstorm, transportation accidents, utility interruption, and winter storms.

Please provide as much detail as possible so that mitigation actions can be expanded and customized for your municipality to accurately reflect your capabilities and methods of operation.

1. Which properties in your jurisdiction are most at-risk from flood events and would have the greatest need for retrofitting or other flood hazard mitigation measures? All repetitive loss and severe repetitive loss properties should be included. Specific property addresses need not be listed (to ensure residential privacy), but names of streets or neighborhoods can be included.

2. What public outreach and education actions would you be most interested in implementing?
 - A. Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.
 - B. Provide hazard and risk reduction information through social media channels and e-mail blast systems.
 - C. Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.
 - D. Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.
 - E. Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.
 - F. Encourage private business owners and managers of infrastructure that provide critical services in post-disaster situations to develop Continuity of Operations Plans or Business Continuity Plans.
 - G. Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.
 - H. Other:

3. Which roads would benefit from mitigation or structural projects to reduce vulnerability to flood or stormwater incidents? Also, please specify the types of projects that would most help a high-risk road (for example, new/expanded culvert, road elevation, repaving, etc.), if this information is available.



4. What areas in the municipality are still in need of stormwater rehabilitation and upgrades?
5. Which areas of your municipality concern you regarding hazardous materials (HazMat) releases, whether from a fixed facility, pipeline, natural gas wells, or transportation accident?
6. Which roads would benefit from mitigation or structural projects to reduce vulnerability to HazMat incidents? Also, please specify the types of projects that would most help a high-risk road (for example, lower speed limits), if this information is available.
7. What areas of your municipality have undergone landslides, or are you worried that landslides will happen? What structures or infrastructure is under threat from this?
8. Where in your municipality have land subsidence or sinkholes occurred? What facilities or infrastructure is under threat from this?
9. What facilities are you concerned could be targets of a terrorist attack?
10. What roads or intersections in the municipality are considered high-risk and would benefit from improved design, routing, and traffic control functions? To which hazards (if any) are these roads most vulnerable?
11. Which critical facilities still need or would benefit from a backup generator or redundant power supply?
12. In what other mitigation projects are you interested or targeting for completion during the next 5 years? Please provide as much detail as possible.

Thornbury Township Mitigation Strategies for Consideration

1. The most at-risk from flood events are:
 - a. 1200 S Westtown Road (Township Park – Soccer Park)
 - b. 840 E Street Road (Goose Creek Park)
 - c. Neighborhood of Thornbury Estates located off from US 202
2. Interested in implementing: A, B, D, F
3. Roads that would benefit from mitigation
 - a. Route 926 (E Street Road)
 - i. @ S Westtown Road
 - ii. @ Cheyney Road
 - iii. @ 270 E Street Road
 - b. Westtown Thornton Road under the SEPTA bridge
 - c. Neighborhood of Thornbury Estates located off from US 202 (new inlets, swales, etc.)
4. Thornbury Township would like to upgrade/rehab stormwater facilities on S Concord road and the neighborhood of Thornbury Estates if funding were available for the planning and implementation.
5. Transportation accident would have the have highest concern for a hazardous material release.
6. Roads that would benefit to reduce vulnerability to HazMat:
 - a. US 202 Wilmington Pike
 - i. Better traffic control to reduce congestion
 - ii. Expansion of highway to provide steer clear areas and/or breakdown areas
 - b. Enforcement of “Weight Restrictions” on many of the Townships roads. This could be accompanied with installation of traffic calming systems to further the reduction of the trucks illegally using the roadways.
7. N/A
8. N/A
9. Targets for Terrorism
 - a. Cheyney University
 - b. Meadowcroft Presbyterian Church
 - c. The Concept School
 - d. Kindercare
10. High risk intersections/roads
 - a. 202 and 926 (too congested)
 - b. S Concord Road (township road that is inundated with traffic avoiding 202)
 - c. Westtown-Thornton Road (flooding issue)
11. The Township building would benefit from a backup generator
12. TBD

Thornbury Township Risk Assessment Review

Hazard Risk	Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Risk Factor
	Utility Failure	4	2	3	4	2	3
	Flood, Flash Flood, and Ice Jams	4	2	2	2	2	2.6
	Opioid Epidemic	4	1	1	4	1	2.2
	Pandemic	1	4	2	1	4	2.4
	Tornadoes & Windstorms	2	3	3	3	3	2.7
	Environ. Hazards	2	1	1	4	1	1.6
	Invasive Species	4	1	4	1	4	2.8
	Terrorism	2	2	1	4	2	2
	Extreme Temp	4	1	4	1	2	2.6
	Winter Storms	4	2	4	1	2	2.9
	Pipeline Incidents	2	1	1	4	2	1.7
	Drought and Water Supply Def.	2	2	3	1	4	2.3
	Transportation Accidents	4	1	1	4	1	2.2
	Radon Exposure	1	1	1	1	4	1.3
	Earthquake	2	1	4	4	3	2.4
	Structural Fires	3	1	1	4	1	1.9
	Hurricane and Trop Storms	2	1	4	1	3	2.1
	Nuclear Incidents	1	2	1	4	3	1.8
	Dam Failure	1	1	1	2	2	1.2

Less than County

Higher than County

Same as County

Thorndbury Township ranked hazard list

Hazard Risk	Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Risk Factor
High	Utility Failure	4	2	3	4	2	3
	Winter Storms	4	2	4	1	2	2.9
	Invasive Species	4	1	4	1	4	2.8
	Tornadoes & Windstorms	2	3	3	3	3	2.7
	Flood, Flash Flood, and Ice Jams	4	2	2	2	2	2.6
	Extreme Temp	4	1	4	1	2	2.6
	Earthquake	2	1	4	4	3	2.4
	Pandemic	1	4	2	1	4	2.4
	Drought and Water Supply Def.	2	2	3	1	4	2.3
	Opioid Epidemic	4	1	1	4	1	2.2
Medium	Transportation Accidents	4	1	1	4	1	2.2
	Hurricane and Trop Storms	2	1	4	1	3	2.1
	Terrorism	2	2	1	4	2	2
	Structural Fires	3	1	1	4	1	1.9
	Nuclear Incidents	1	2	1	4	3	1.8
	Pipeline Incidents	2	1	1	4	2	1.7
	Environ. Hazards	2	1	1	4	1	1.6
	Radon Exposure	1	1	1	1	4	1.3
	Dam Failure	1	1	1	2	2	1.2

Less than County
 Higher than County
 Same as County

Municipality: Tredyffrin Township

Name of Representative from Municipality: Steven Burgo

Date: 11/24/20

Time: Roughly 11 am

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

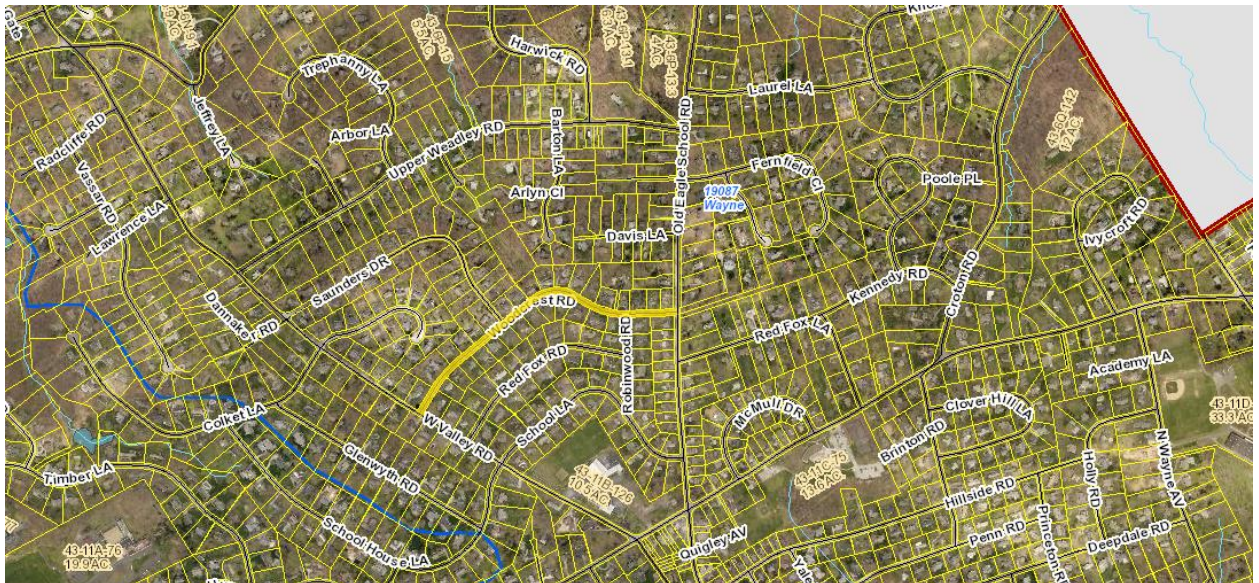
Flooding/Flash flooding definitely seeing an increase especially as intense storms become more prevalent, more intensity in storms. Increase in concerns about flooding. Clogged inverts (owned by PennDOT). Has made several requests for cleaning out and removing debris (often it is removed by laid close by so it ends up happening again).

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Hadwick Road and Upper Weedly Road

Wills Lane and Woodcrest Drive an Saunders Drive

\$1 million municipal stormwater project along Trout Creek to install/expand stormwater infrastructure. Will include infiltration system.



3. Are their mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Public awareness and emergency alerting systems ongoing....

Acquisition project unknown

4. What updates do you have to your planning and administrative capabilities since 2015?

Lots of residential development in the township over the last several years. In-staff engineer applying for grants to help support stormwater management improvements.

EOP- Yes

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- Yes

NFIP Ordinance- Y

Building Codes- Y

GIS Technology- Y

Water Sewer Authority-

Capital Improvement Plans- Yes

Building Code- Y

Engineer- Y

Planning Commission- Y

Stormwater Management Ordinance/MS4 Plan- Y

Radon Requiremen

Road Crew- Public Works

Hazard Identification and Risk Evaluation Worksheet

Name: _JANE DAGGETT_ Title: _____SECRETARY

Jurisdiction: _____UPPER OXFORD TOWNSHIP_

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	I	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	D	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	BROADBAND CONNECTIVITY ISSUES
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _____UPPER OXFORD TWP_____ Point of Contact Name and Title: JANE DAGGETT-SECRETARY__

Phone: _610-932-9233_____ E-mail: __UPPEROXFORD@HOTMAIL.COM__

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X			N/A	SEE EOP
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan					
Zoning Regulations	X			N/A	SEE ZONING REGS



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X				SEE ZONING REGS
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X			OXFORD REGION PLANNING COMMISSION	SEE ORPC COMP PLAN
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				SAA
Stormwater Management Plan / Ordinance	X				SAA
Natural Resource Protection Plan	X				SAA
Capital Improvement Plan	N/A				
Economic Development Plan	N/A				
Historic Preservation Plan	X				SAA
Farmland Preservation	X				SAA
Building Code	X				SAA
Fire Code	N/A				
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		CHESTER COUNTY PLANNING COMISSION	
Planners or engineers (with natural and/or human caused hazards knowledge)		X		
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		X		
Emergency Manager		X		
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees	X		UOT PLANNING COMM	
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X		UOT BOARD OF SUPERVISORS	
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		UOT BOARD OF SUPERVISORS	WEB PAGE/NEWSLETTERS
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		Oxford Region Emergency Management	
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	x		
Administrative and Technical Capability	x		
Financial Capability	x		
Education and Outreach	x		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: UPPER OXFORD TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	UNK	
c. Does the municipality support requests for map updates?	If yes, specify how.	UNK	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	UNK	



2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.		
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.		

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.		
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.		
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.		

Hazard Identification and Risk Evaluation Worksheet

Name: Byron Nickerson Title: EMC

Jurisdiction: Upper Uwchlan

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	I	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	I, in general	Our IT Firm monitors & resolves
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	I	Increased population/traffic
Nuclear Incidents	NC	
Transportation Accidents	I	Increased population/traffic

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: Upper Uwchlan Township Point of Contact Name and Title: Byron Nickerson, EMC

Phone: 484-650-0295 E-mail: bnickerson@upperuwchlan-pa.gov

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	2/2016		EMPC	
Emergency Operations Plan	X				
Disaster Recovery Plan			X		
Evacuation Plan	X				
Continuity of Operations Plan	X				Police Dept. has a COOP. Township Administration's COOP is in progress
NFIP	X	2017			
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X				
Floodplain Management Plan	X				

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Zoning Regulations	X				
Subdivision Regulations	X				
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	2014			
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X				
Stormwater Management Plan / Ordinance	X				
Natural Resource Protection Plan					
Capital Improvement Plan	X				
Economic Development Plan					
Historic Preservation Plan	X				
Farmland Preservation					
Building Code	X				
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X			Contractor
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Police/Public Works	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Administration	
Emergency Manager	X		EMPC	
NFIP Floodplain Administrator	X		Zoning	
Land Surveyors	X			
Scientists or staff familiar with the hazards of the community	X		Police, EMC	
Personnel skilled in GIS and/or FEMA’s HAZUS program	X			Contractor
Grant writers or fiscal staff to handle large or complex grants	X		Police, Administration	
Staff with expertise or training in benefit-cost analysis	X		Finance	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X			
Community Development Block Grants (CDBG)	X			
Special Purpose Taxes	X			
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X			
Stormwater Utility Fees		X		
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X			
Public-private partnership initiatives addressing disaster-related issues	X			
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X			
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability		X	
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: UPPER UWCHLAN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Y	8/21/2017
c. Does the municipality support requests for map updates?	If yes, specify how.	Y	WRITTEN REQUEST
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	N	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	WRITTEN REQUEST
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	TWP.SECRETARY

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Y	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Y	ZONING
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Y	ZONING
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Y	ZONING
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Y	ZONING
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Y	ZONING

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	N	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	N	BUT, POTENTIAL NEWSLETTER COMMUNICATION
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	N	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	N	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: BYRON NICKERSON Title: EMC Jurisdiction: UPPER UWCHLAN TWP

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
<p>UUT has an active, multifaceted public health and safety awareness program.</p>		
Goal 2	Reduce personal and property disaster losses	
<p>All UUT departments proactively work to identify personal and property vulnerability issues and, if necessary, work with the potentially affected public to mitigate possible problems.</p>		
Goal 3	Increase disaster resilience of public and private infrastructure	
<p>UUT has an active, multifaceted public emergency awareness, preparedness and response program.</p>		



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Township manager is aware of this goal and has shared this goal with department heads.		
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
UUT has multiple commissions made up of volunteers with multidisciplinary experience. expertise that identify potential hazards		
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	
In progress – continuous.		

Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			UUT complies with County directives
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones			X			
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			
AH-4. Provide regular updates to the countywide Mass Care Plan	X					UUT will comply with County directives
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X			
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			UUT complies with County directives
AH-7. Promote and provide emergency management training opportunities			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					EMPC routinely presents hazard mitigation concepts and recommended mitigation measures in the Township newsletter and on Township web sites.
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			
AH-11. Enhance the communications equipment between the County and the municipalities			X			UUT complies with County directives
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery			X			UUT maintains a website and multiple social media sites
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
FC-16. Provide education to the municipalities on resident evacuation processes and need			X			UUT complies with County directives
AH-17. Provide education to the municipalities on tracking road closures			X			
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities		X				
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard		X				
AH-21. Encourage municipalities to require radon testing at the time sale of homes			X			UUT complies with County directives
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	X					UUT will comply with County directives
TS-2. Sustain tree management programs around power lines		X				UUT and PECO
TS-3. Encourage new development planning to include burying of utility cables			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County			X			UUT complies with County directives
F-2. Educate county residents on the NFIP following flood events			X			
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			X			
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			UUT complies with County directives
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			
F-8. Implement the Act 167 Plan (Stormwater management)			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-9. Manage integrity and functions of existing regional flood control facilities			X			
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams			X			UUT complies with County directives
F-11. Develop and implement a model natural conservation ordinance for municipal adoption			X			UUT complies with County directives
F-12. Continue to maintain the stream gauges	X					
F-13. Continue to maintain the stream gauges within the County	X					
F-14. Install stream gauges if an additional area is identified to benefit from one	X					
F-15. Provide education to the municipalities on flood gauges	X					
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road			X			
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs		X				
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	X					
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			X			
WS-3. Improve storm drains throughout the County to handle snow melt			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
WS.4. Plant bushes/other vegetation to stop drifting snow in known problem areas			X			
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			X			UUT complies with County directives
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			
TOR-2. Develop a countywide Debris Management Plan			X			UUT complies with County directives
TOR-3. Provide public information on debris management			X			
TOR-4. Retrofit critical public facilities with safe rooms				X		
D-1. Provide public information on the effects of droughts on public and private wells	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
D-2. Promote sustainability programs and green practices throughout the County			X			UUT complies with County directives
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					
PG-1. Encourage security check of bags/coolers at public gathering	X					
PG-2. Plan for and implement strengthened security at public events			X			
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events			X			
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation		X				
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-6. Purchase temporary mobile camera to set up for events	X					
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents			X			
PG-10. Increase advanced planning through use of the incident action plan process			X			
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages		X				
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster			X			
TRF-7. Provide public education on traffic accident reduction	X					
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations			X			
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources			X			
IL-4. Plan for replenishment fuel for generators			X			
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site			X			
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts			X			UUT complies with County directives

Mitigation Action Plan Review Worksheet- Upper Uwchlan Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Upper Uwchlan Township			X			
Emergency alerting systems for Upper Uwchlan Township			X			
Township wide Tree trimming and/or selective removal			X			
Raise Fellowship Rd roadway at Red Bone Rd	X					
Stormwater culvert and basin re-sizing on Krauser Rd	X					
Stormwater culvert and basin re-sizing on Greenridge Rd	X					
Acquisition/Elevation of the structure located at 2 Kiloran Wynd	X					
Acquisition/Elevation of the structure located at 80 Saint Andrews Ln	X					
Protect Structure with Barrier on Font Rd	X					
Protect Structure with Barrier on St. Andrews Lane	X					
Protect Structure with Barrier on Krauser Rd		X				Stormwater pipe replaced 2020
Protect Structure with Barrier on Dorothy Ln	X					

Mitigation Strategy 5-Year Mitigation Plan Review

<i>Existing Mitigation Action</i>	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Protect Structure with Barrier on Moore Rd and Turnstone Way	X					
Protect Structure with Barrier on Lyndell Rd	X					
Protect Larkins Bridge with Barrier	X					
Protect Windsor Schoolhouse with barrier	X					

Municipality: Uwchlan Township

Name of Representative from Municipality: Mike Holmes EMC 33 + years with township

Date: 23-Oct-20

Time: 1145 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Road Department working on improvements where needed.

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Nothing at this time

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Yes

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- Yes

NFIP Ordinance- None

Building Codes- Yes, Statewide Code

GIS Technology- County

Water Sewer Authority- Yes

Capital Improvement Plans- Upgrade to Culverts and Stream Piping

Building Code- Township Employee

Engineer- Third Party Contract

Planning Commission- Yes

Stormwater Management Ordinance / M/SR 4 Plan

Yes Up to date

Municipality: Valley Township

Name of Representative from Municipality: Jancies Rambo

Date: 23-Oct-20

Time: 1154 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

None

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Infrastructure - Working on Wagontown Road (Road Closed at this time)

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Working on updates

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- None

NFIP Ordinance- None

Building Codes- Yes Statewide Code

GIS Technology-County

Water Sewer Authority- Yes at the present time in negotiation to sell to PA

Capital Improvement Plans- Township Building (Under Construction to be completed Nov 2020)

Building Code- Third Party Contract

Engineer- Third Party Contract

Planning Commission- Yes

Stormwater Management Ordinance / M/SR 4 Plan - Yes Up to date

Municipality: Warwick Township

Name of Representative from Municipality: Joan Grimley

Date: 23-Oct-20

Time: 1128 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No None

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Nothing at this time

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Nothing at this time

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Working with new EMC

SALDO- None

Zoning- Yes, Minor revisions

Flood Plain Ordinance- Working on

NFIP Ordinance- None

Building Codes- None

GIS Technology-County

Water Sewer Authority- None work with Health Department

Capital Improvement Plans- None

Building Code- Third Party Contract

Engineer- Third Party Contract

Planning Commission- Yes

Stormwater Mangement Ordinance / M/SR 4 Plan

None at this time

Municipality: West Bradford

Name of Representative from Municipality: Jim Lucas, EMC and Fire Marshall West Bradford Township

Date: 11/24/20

Time: 3pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

- Stormwater concerns are definitely a concern, may be more intense stormwater

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

- Roadway flooding: Broad Run Rd. between Beacon Hill

3. Are their mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

- No progress on downing

- Realignment of 322 elevated road so that issues with Sugars Bridge Rd and 322 flooding are not as significant.

- Applied for FEMA grant, never received grant for WWTP

 - Capacity exists for a few days

 - Back up gennys forcing WWTP to take in affluent that they can't process

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology-

Water Sewer Authority-

Capital Improvement Plans-

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Requirement- Unsure , testing may not explicitly by township, but is a requirement for banks.

Road Crew-

Mitigation codes are required in new constructions, radon.

Hazard Identification and Risk Evaluation Worksheet

Name: Joseph Dell'Arciprete

Title: Director of Emergency Management

Jurisdiction: West Brandywine Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures		
Flood, Flash Flood, and Ice Jam	I	New Housing and Commercial developments in township requires additional attend to storm water management
Hurricane and Tropical Storm	I	Increase in recent storms has required additional attention to mitigation and recovery procedures
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Dam Breaches	NC	
Extended Utility, Data, or Telecomm Disruptions	I	Due to the increase dependence to telecommunication, municipality had increase bandwidth and acquired new support devices
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused



Building or Structure Collapse

Mass Food/Animal Feed Contamination

Disorientation

Terrorism

Drowning

Utility Interruption

Levee Failure

War and Criminal Activity

Additional Comments:

Municipality: West Brandywine Township

Name of Representative from Municipality: Linda Formica

Date: 23-Oct-20

Time: 1400 hrs

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

Rt 82 and Reesville Road (PENNDOT Road) working with PENNDOT and Township

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Rt 82 and Reesville Road (PENNDOT Road) working with PENNDOT and Township

4. What updates do you have to your planning and administrative capabilities since 2015?

EOP- Yes

SALDO- Yes

Zoning- Yes

Flood Plain Ordinance- Yes

NFIP Ordinance- None

Building Codes- Yes

GIS Technology-County

Water Sewer Authority- Sewer Authority only

Capital Improvement Plans- Working on Plan

Building Code- Township Employee

Engineer- Third Party Contract

Planning Commission- Yes

Stormwater Management Ordinance / M/SR 4 Plan - Yes Up to date

Hazard Identification and Risk Evaluation Worksheet

Name: Paul E. Pfitzenmeyer

Title: Emergency Management Coordinator

Jurisdiction: West Caln Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	I	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	
Tornado and Windstorm	I	
Winter Storm	I	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	I	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	I	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input checked="" type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input checked="" type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|---|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input checked="" type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input checked="" type="checkbox"/> Disorientation | <input checked="" type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input checked="" type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: **West Caln Township**

Point of Contact Name and Title: **Paul E. Pfitzenmeyer, Emergency Management Coordinator**

Phone: **610-384-5643**

E-mail: **EMA@WestCaln.org**

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X	5/9/2005			
Disaster Recovery Plan					
Evacuation Plan	X			Coatesville Area School District	Kings Hwy. Elementary School
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	8/9/2017			
Floodplain Management Plan					

Capability Assessment Survey

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Zoning Regulations	X	2/25/2006			
Subdivision Regulations	X	9/30/2010			
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	3/25/1998	X		
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1997			
Stormwater Management Plan / Ordinance	X	4/21/2014			
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan	X	6/18/1995			
Farmland Preservation	X	?			
Building Code	X	6/28/2004			
Fire Code	X	7/10/1995			
Other					



2. **Administrative and Technical Capability:** Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an "X" in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Township Engineer	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Township Engineer	
Emergency Manager	X		Emergency Management	
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA's HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes	X			EMS/Fire
Gas / Electric Utility Fees		X		
Water / Sewer Fees		X		
Stormwater Utility Fees		X		
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X			
Other				

4. **Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification	X		County of Chester	
Natural disaster or safety related school programs		X	County of Chester	
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		PA American Water Wagontown Fire Company	
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Financial Capability	X		
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: WEST CALN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.		
c. Does the municipality support requests for map updates?	If yes, specify how.	YES	Answering via e-mail
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	YES	If necessary
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	If available
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	Administration

2. FLOODPLAIN MANAGEMENT

Requirement

Recommended Action

Yes/No

Comments

<p>a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:</p>	<p>If yes, answer questions (1) through (4) below.</p>	<p>YES</p>	
<p>(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?</p>	<p>If yes, specify the office responsible.</p>	<p>NO</p>	
<p>(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?</p>	<p>If yes, specify the office responsible.</p>	<p>NO</p>	
<p>(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?</p>	<p>If yes, specify the office responsible.</p>	<p>NO</p>	
<p>(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?</p>	<p>If yes, specify the office responsible.</p>	<p>NO</p>	
<p>b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?</p>	<p>If yes, specify how.</p>	<p>YES</p>	

2. FLOODPLAIN MANAGEMENT		
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	<p>If yes, specify activities.</p>	<p>NO</p>

Comments

3. FLOOD INSURANCE		
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	NO
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO

Comments

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Paul E. Pfitzenmeyer Title: Emergency Management Coordinator Jurisdiction: West Caln Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	

Suggested Additional Goals and/or Objectives		Comments
Goal	Revise and update current TWP EOP	
Objective	Update with new hazards	
Objective	Update to comply with legislative changes	
Objective	Expand to incorporate other	
Goal	Develop a hazard mitigation plan for the TWP	
Objective	Create plan specific to TWP hazards	
Objective		
Objective		

Mitigation Strategy 5-Year Mitigation Plan Review

Goal			
Objective			
Objective			
Objective			



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status				Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	
AH-1. Catalog critical facilities and infrastructure within the County					
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones					
AH-3. Adhere to statewide Uniform Construction Code for New Construction					
AH-4. Provide regular updates to the countywide Mass Care Plan			X		
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County			X		
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X		
AH-7. Promote and provide emergency management training opportunities			X		
AH-8. Arrange and hold hazard mitigation workshops for county residents	X				
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X				
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	X				
AH-11. Enhance the communications equipment between the County and the municipalities			X		

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads						
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures						
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities						
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables			X			
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events						
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			
F-8. Implement the Act 167 Plan (Stormwater management)			X			
F-9. Manage integrity and functions of existing regional flood control facilities			X			



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams						
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						
F-12. Continue to maintain the stream gauges						
F-13. Continue to maintain the stream gauges within the County						
F-14. Install stream gauges if an additional area is identified to benefit from one						
F-15. Provide education to the municipalities on flood gauges						
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road						
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water						
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate						
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs						
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education						
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows						

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired						
WS-1. Provide public information on utility outages and the need to prepare for storms						
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents						
WS-3. Improve storm drains throughout the County to handle snow melt						
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas						
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			X			
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			
TOR-2. Develop a countywide Debris Management Plan						



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-3. Provide public information on debris management						
TOR-4. Retrofit critical public facilities with safe rooms						
D-1. Provide public information on the effects of droughts on public and private wells						
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						
PG-1. Encourage security check of bags/coolers at public gathering						
PG-2. Plan for and implement strengthened security at public events						
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status				Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens					
PG-6. Purchase temporary mobile camera to set up for events					
PG-7. Utilize temporary mobile camera during large events to monitor safety and security					
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events					
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents					
PG-10. Increase advanced planning through use of the incident action plan process					
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure					



Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage						
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events						
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)						
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages						
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster						
TRF-7. Provide public education on traffic accident reduction						
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County						
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations						
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices						



Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources				X		
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						
IL-6. Continue to engage the private sector to become involved in emergency preparedness						
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						



Hazard Identification and Risk Evaluation Worksheet

Name: Michael A. Perrone

Title: Borough Manager

Jurisdiction: Borough of West Chester

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	I	
Tornado and Windstorm	I	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: West Chester Borough

Point of Contact Name and Title: Michael A. Perrone

Phone:610-344-3246

E-mail: mperrone@west-chester.com

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	S				
Emergency Operations Plan	X			BOROUGH	
Disaster Recovery Plan	N				
Evacuation Plan	N				
Continuity of Operations Plan	N				
NFIP	N				
NFIP – Community Rating System	N				
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	S				
Floodplain Management Plan	S	6/21/2017			
Zoning Regulations	S	10/6/1988			Rewrite in progress



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	S	3/19/2019			
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	S	2/15/2017			
Open Space Management Plan (or Parks/Rec or Greenways Plan)	N				
Stormwater Management Plan / Ordinance	S	12/18/2013			
Natural Resource Protection Plan	N				
Capital Improvement Plan	N				
Economic Development Plan	N				
Historic Preservation Plan	S	2/24/2011			
Farmland Preservation	N				
Building Code	S	4/21/2004			Chapter 43
Fire Code	S	4/21/2004			
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)		X		
Planners or engineers (with natural and/or human caused hazards knowledge)		X		
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)		X		
Emergency Manager	Y		BOROUGH	
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA’s HAZUS program		X		
Grant writers or fiscal staff to handle large or complex grants		X		
Staff with expertise or training in benefit-cost analysis		X		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)	X			
Special Purpose Taxes			BOROUGH ADMIN	
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		SEWER DEPARTMENT	
Stormwater Utility Fees	X		FINANCE DEPARTMENT	
Development Impact Fees		X		
General Obligation, Revenue, and/or Special Tax Bonds		X		
Partnering Arrangements or Intergovernmental Agreements	X		BOROUGH MANAGER	
Other				

- 4. Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		X		
Public-private partnership initiatives addressing disaster-related issues		X		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		X		
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability		X	
Financial Capability	X		
Education and Outreach	X		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: WEST CHESTER BOROUGH

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Y	
c. Does the municipality support requests for map updates?	If yes, specify how.	Y	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Y	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	N	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Y	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Y	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Y	
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Y	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Y	

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	N	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	N	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	N	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	N	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Michael A. Perrone, C.B.O.

Title: Borough Manager

Jurisdiction: West Chester Borough

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal	Work with West Goshen Township on flooding issues at Montgomery Avenue; West Chester, PA	
Objective	Reduce flooding	
Objective	Apply to PennDOT to raise the road	
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County	X					Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones	X					
AH-3. Adhere to statewide Uniform Construction Code for New Construction				X		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan	X					Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community	X					
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents	X					Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	X					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters	X					Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities				X		
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery	X					
AH-13. Continue infrastructure improvements through community development			X			
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments	X					
AH-15. Implement a system to report blocked/closed roads				X		
FC-16. Provide education to the municipalities on resident evacuation processes and need	X					
AH-17. Provide education to the municipalities on tracking road closures	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines	X					
TS-2. Sustain tree management programs around power lines			X			
TS-3. Encourage new development planning to include burying of utility cables				X		
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County				X		
F-2. Educate county residents on the NFIP following flood events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps				X		
F-6. Follow state and County stormwater regulations				X		
F-7. Enforce floodplain management ordinances				X		Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)				X		
F-9. Manage integrity and functions of existing regional flood control facilities	X					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams	X					
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	X					Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate	X					
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs	X					
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education	X					
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows	X					

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms	X					
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents				X		
WS-3. Improve storm drains throughout the County to handle snow melt	X					
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency	X					Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris	X					Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan	X					
TOR-3. Provide public information on debris management	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County	X					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events	X					
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	X					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	X					
PG-6. Purchase temporary mobile camera to set up for events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events	X					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents	X					
PG-10. Increase advanced planning through use of the incident action plan process	X					Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	X					Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage	X					Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events	X					
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)		X				Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County	X					Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws	X					
IL-1. Provide private sector education/outreach related to cyber security best practices	X					
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	X					
IL-3. Purchase backup generators for critical infrastructure/key resources	X					
IL-4. Plan for replenishment fuel for generators	X					
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site	X					



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness	X					
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts	X					



Mitigation Action Plan Review Worksheet- West Chester Borough

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for West Chester Borough	X					
Emergency alerting systems for West Chester Borough				X		
Construct larger culverts/pipes at the Southeast Quadrant			X			
Reduce roadway flooding on Barnard Street Railroad Bridge			X			
Obtain back-up generator for Goodwill Fire Company	X					

Municipality: West Fallowfield

Name of Representative from Municipality: Chuck Harris, EMC

Date: 02/16/2021

Time: 5pm

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No, West Fallowfield is consistent with the county with hazard. There is a slight concern with SR 41 and 10 about the truck traffic and what may be traversing the township.

What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

They have problems with flooding generally, but no specific places given.

2. Are their mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Generators have been put on lights identified in the 2015 plan.

3. What updates do you have to your planning and administrative capabilities since 2015?

All of these things are in place and updated as needed. No changes have been made to capabilities.

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology-

Water Sewer Authority-

Capital Improvement Plans-

Building Code-

Engineer-

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Radon Requirements

Road Crew- PW Dept

Hazard Identification and Risk Evaluation Worksheet

Name: Richard J. Craig, P.E. Title: Township Engineer

Jurisdiction: West Goshen Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: _West Goshen Township_____ Point of Contact Name and Title: _Andrea Testa, Emergency Management Coordinator

Phone: _610-696-5266_____ E-mail: __atesta@westgoshen.org_____

- 1. Planning and Regulatory Capability:** Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X			EMC	
Emergency Operations Plan	X	Yearly		EMC	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP	X	7/19/17		Township Engineer	
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	7/19/17		Township Engineer	
Floodplain Management Plan	X	7/19/17		Township Engineer	
Zoning Regulations	X	7/25/19		Township Zoning Officer	



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations	X	11/13/13			
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	6/13/19			
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	X	11/13/13			
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	X	5/26/04			
Fire Code	X	5/26/04			
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Engineering	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Engineering	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Engineering/Codes	
Emergency Manager	X		Fire Marshal	
NFIP Floodplain Administrator	X		Engineering	
Land Surveyors				
Scientists or staff familiar with the hazards of the community	X		Engineering/Fire Marshal	
Personnel skilled in GIS and/or FEMA’s HAZUS program	X		Engineering	
Grant writers or fiscal staff to handle large or complex grants				
Staff with expertise or training in benefit-cost analysis				
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Finance	
Community Development Block Grants (CDBG)				
Special Purpose Taxes				
Gas / Electric Utility Fees				
Water / Sewer Fees	X		Finance	
Stormwater Utility Fees	X		Finance	
Development Impact Fees				
General Obligation, Revenue, and/or Special Tax Bonds	X		Finance	
Partnering Arrangements or Intergovernmental Agreements	X		Township Manager	
Other				

- 4. Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		Fire Safety, Stormwater Management	
Public-private partnership initiatives addressing disaster-related issues				
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.				
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		X	
Administrative and Technical Capability			X
Financial Capability		X	
Education and Outreach		X	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: WEST GOSHEN TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	
c. Does the municipality support requests for map updates?	If yes, specify how.	Yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Engineer

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	Yes	Engineer
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Engineer
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Engineer/Codes
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Codes
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Engineer

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	No new construction is allowed in the SFHA

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	Letter detailing flood map changes
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	Determination of location within SFHA

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Andrea Testa Title: EMC Jurisdiction: West Goshen Township

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			XXX			Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction				Yes		Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan			Yes			Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County				Yes		
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			Yes			
AH-7. Promote and provide emergency management training opportunities			Yes			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents		XXX				Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division	XXX					Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			XXX			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities				XXX		
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development						
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments						
AH-15. Implement a system to report blocked/closed roads				XXX		
FC-16. Provide education to the municipalities on resident evacuation processes and need						
AH-17. Provide education to the municipalities on tracking road closures				Yes		Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities		XXX				<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders						
AH-20. Provide public information surrounding Radon hazard						
AH-21. Encourage municipalities to require radon testing at the time sale of homes						
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines						
TS-2. Sustain tree management programs around power lines						
TS-3. Encourage new development planning to include burying of utility cables						
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			XXX			
F-6. Follow state and County stormwater regulations			XXX			
F-7. Enforce floodplain management ordinances			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
F-8. Implement the Act 167 Plan (Stormwater management)				XXX		
F-9. Manage integrity and functions of existing regional flood control facilities			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams			XXX			
F-11. Develop and implement a model natural conservation ordinance for municipal adoption	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-12. Continue to maintain the stream gauges	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	XXX					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water		XXX				
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate		XXX				
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs		XXX				
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education		XXX				
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows			XXX			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	XXX					
WS-1. Provide public information on utility outages and the need to prepare for storms			XXX			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents			XXX			
WS-3. Improve storm drains throughout the County to handle snow melt			XXX			
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan		XXX				
TOR-3. Provide public information on debris management			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County	XXX					
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events		XXX				
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation	XXX					
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens	XXX					
PG-6. Purchase temporary mobile camera to set up for events	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure	XXX					<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			XXX			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages			XXX			<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster		XXX				Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction			XXX			Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County		XXX				Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations		XXX				Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws			XXX			
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers	XXX					
IL-3. Purchase backup generators for critical infrastructure/key resources						
IL-4. Plan for replenishment fuel for generators						
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site						

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness			XXX			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						

Mitigation Action Plan Review Worksheet- West Goshen Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for West Goshen Township				X		Newsletter
Emergency alerting systems for West Goshen Township				X		Connect CTY
Improve Culvert at 103 Oak Lane	X					
Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery	X					

Hazard Identification and Risk Evaluation Worksheet

Name: Chuck Freese Title: ___EMC

Jurisdiction: West Grove Borough

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|--|--|
| <input checked="" type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Chuck Freese, EMC for West Grove, Londonderry, Penn Township,

12/11/2020

10:30 am

1. Londonderry- Frontier coverage (poor coverage), cell phone coverage isn't great. Infrastructure hasn't upgraded and with more development in the future, it could stretch bandwidth.

No change otherwise.

West Grove Borough- a member of regional police force, is "more urban", so there may be a slight increase in civil unrest there only due to population density, no direct incidents there.

2. Penn Township- growing, continual construction, changes to landscape
 - a. Area of interest- Storm water controls- up and coming community
 - b. Moving forward, Penn Township has seen a little more development, may see increase in 55+ communities.
 - c. New shopping center
3. No changes in planning capabilities, but will check in with townships to see if planning capabilities have changed dramatically.

Municipality: West Marlborough Township

Name of Representative from Municipality: Shirley K. Walton, Township Secretary/Treasurer/RtKo

Date: 11/23/2020

Time: 11:35 am

1. Have you seen any changes, either increases or decreases, to any hazards as defined by the 2015 Hazard Mitigation Plan? Do you have any changes or comments you would like to make about the identified hazards for the 2020 update?

No change in hazards as defined

COVID-19 is additional concern.

2. What specific areas of your community are being significantly impacted by these hazards? (e.g. culverts, blocked roadways, problem intersections, flooding locations?)

-Rt 82 (Unionville to Coatesville) a couple of bridges flood

3. Are there mitigation actions completed, not completed, omitted, continuous, or in progress. Take comments on additional changes or challenges to mitigation actions/strategies overall.

Continuous, now have a website to share information

4. What updates do you have to your planning and administrative capabilities since 2015?

No updates

EOP-

SALDO-

Zoning-

Flood Plain Ordinance-

NFIP Ordinance-

Building Codes-

GIS Technology- Yes

Water Sewer Authority-

Capital Improvement Plans- Not formal

Building Code-

Engineer- Contracted

Planning Commission-

Stormwater Management Ordinance/MS4 Plan-

Hazard Identification and Risk Evaluation Worksheet

Name: ___'Barclay Hargreaves_____ Title: ___EMC_____

Jurisdiction: ___Elverson Boro and West Nantmeal Twp_____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Hazard Identification and Risk Evaluation Worksheet

Name: Candace Miller Title: Secretary/Treasurer

Jurisdiction: West Nottingham Township

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	NC	
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|--|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: West Nottingham Township Point of Contact Name and Title: Candace Miller, Sec/Treas

Phone: (610) 932-4072 E-mail: westnottinghamtwp@zoominternet.net

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	x	5/24/16			
Emergency Operations Plan	x	05/12/20		EMC	
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)					
Floodplain Management Plan	x	07/24/17			
Zoning Regulations	x	03/26/13		Zoning Board	Adopted 08/1/2012 & amended 03/26/2013



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	x	04/03/06		Planning Commission	
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	x	4/15/14		Municipal Road Crew and Zoning Officer	
Natural Resource Protection Plan					
Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	x			IBC	
Fire Code					
Other					

2. Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an “X” in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	x		Planning Commission	
Planners or engineers (with natural and/or human caused hazards knowledge)	x		Planning Commission	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	x		Township Engineer	
Emergency Manager	x		EMC	
NFIP Floodplain Administrator				
Land Surveyors		x		
Scientists or staff familiar with the hazards of the community		x		
Personnel skilled in GIS and/or FEMA’s HAZUS program				
Grant writers or fiscal staff to handle large or complex grants		x		
Staff with expertise or training in benefit-cost analysis		x		
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes* (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		x		
Community Development Block Grants (CDBG)		x		
Special Purpose Taxes	x			For Emergency services
Gas / Electric Utility Fees		x		
Water / Sewer Fees		x		
Stormwater Utility Fees		x		
Development Impact Fees		x		
General Obligation, Revenue, and/or Special Tax Bonds		x		
Partnering Arrangements or Intergovernmental Agreements	x			
Other				

4. Education and Outreach: Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification		x		
StormReady certification		x		
Natural disaster or safety related school programs		x		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)		x		
Public-private partnership initiatives addressing disaster-related issues		x		
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		x		
Other				

5. Self-Assessment of Capability: Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		x	
Administrative and Technical Capability		x	
Financial Capability	x		
Education and Outreach		x	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: West Nottingham Township

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	These documents are available during office hours.
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	No	
c. Does the municipality support requests for map updates?	If yes, specify how.	No	We have not had requests for updates.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	We have not had any new technical or scientific data that could result in map revisions.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	No	We have not been asked to provide assistance with floodplain determinations.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	The Zoning Officer maintains this information.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	Section 903
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?	If yes, specify the office responsible.	No	
(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Zoning Officer and Building Codes Official
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Zoning Officer and Building Codes Official
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Zoning Officer and Building Codes Official
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Permits are not issued if the plans don't comply with the ordinance. Inspections are conducted to ensure continued compliance.

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	No	

3. FLOOD INSURANCE

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	No	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	No	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	No	

Mitigation Strategy 5-Year Mitigation Plan Review

Name: Candace Miller Title: Secretary/Treasurer Jurisdiction: W. Nottingham Twp

Purpose: To fulfill the requirement that maintenance of the hazard mitigation plan (HMP) has been completed since the publication of the original or previous version, and to obtain early feedback from the planning team to incorporate into the update process.

Instructions: Complete the *Goal and Objective Review Worksheet* and *Mitigation Action Plan Review Worksheet* on the next pages keeping the following questions in mind:

- Do the goals, objectives, and actions address current and expected conditions?
- Should each goal be carried forward into the updated plan? Should a goal be changed based on current conditions in the community? Should a goal be discontinued, and if so, why?
- What is the status of each action? What progress has been made? Should an action be continued in the updated plan? Should an action be discontinued, and if so, why?
- Has the nature or magnitude of hazard risk changed?
- Are current resources adequate to implement the plan?
- Should additional local resources be committed to address identified hazard threats?
- Are there any issues that have limited the current implementation schedule?
- Have the implementation of identified mitigation actions resulted in expected outcomes?
- Has the Steering Committee measured the effectiveness of completed hazard mitigation projects in terms of specific dollar losses avoided?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?
- Are there other concerns that should be identified?

Before completing the worksheets, the group may wish to discuss the above questions in a round-robin format, using a flip chart. The questions are standard; however it is important to check the existing HMP maintenance section for additional questions that may need to be considered.

Goal and Objective Review Worksheet

Instructions: Write each goal and objective identified in the existing HMP. Use the comment boxes to provide feedback or to suggest modification of any of the proposed goals or objectives. You may suggest additional objectives below each goal, or new goals and objectives on the last page of this exercise.

Existing Goals and Objectives		Comments
Goal 1	Reduce the risk to public safety and public health	
Goal 2	Reduce personal and property disaster losses	
Goal 3	Increase disaster resilience of public and private infrastructure	



Existing Goals and Objectives		Comments
Goal 4	Ensure that new replacement construction is hazard resistant and does not lead to increased hazard risk or exacerbate the effects of hazards	
Goal 5	Identify, encourage, and implement cost effective hazard mitigation measures	
Goal 6	Raise awareness of and encourage participation in hazard mitigation within the community	



Suggested Additional Goals and/or Objectives		Comments
Goal		
Objective		
Objective		
Objective		
Goal		
Objective		
Objective		
Objective		



Goal		
Objective		
Objective		
Objective		



Mitigation Action Plan Review Worksheet

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
AH-1. Catalog critical facilities and infrastructure within the County			X			Has this activity been integrated into the municipality’s normal operations?
AH-2. Upgrade and further develop the county-wide GIS database that incorporates county infrastructure, critical facilities, land use, and hazard zones						
AH-3. Adhere to statewide Uniform Construction Code for New Construction			X			Has this activity been integrated into the municipality’s normal operations?
AH-4. Provide regular updates to the countywide Mass Care Plan			X			Has this activity been integrated into the municipality’s normal operations?
AH-5. Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County	X					
AH-6. Periodically review County response plans and response teams to ensure they meet the needs of the community			X			
AH-7. Promote and provide emergency management training opportunities			X			Has this activity been integrated into the municipality’s normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-8. Arrange and hold hazard mitigation workshops for county residents			X			Has this activity been integrated into the municipality's normal operations?
AH-9. Maintain and foster communications with PEMA and FEMA region III-Mitigation Division			X			Has this activity been integrated into the municipality's normal operations?
AH-10. Examine federal funding opportunities at conference, workshops, and following disasters			X			Has this activity been integrated into the municipality's normal operations?
AH-11. Enhance the communications equipment between the County and the municipalities			X			
AH-12. Enhance the County website to create a place to consolidate public information related to disaster response and recovery						
AH-13. Continue infrastructure improvements through community development		X				
AH-14. Continue to provide community outreach and education about emergency preparedness and actions to take during an emergency. Develop a branded public information campaign that could be used by multiple County Departments			X			
AH-15. Implement a system to report blocked/closed roads			X			
FC-16. Provide education to the municipalities on resident evacuation processes and need			X			
AH-17. Provide education to the municipalities on tracking road closures			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
AH-18. Promote awareness of mental health services and resources throughout all of the facilities within the County to include schools, workplaces, and healthcare facilities	X					<i>Has this activity been integrated into the municipality's normal operations?</i>
AH-19. Increase the involvement of mental health professionals in the Disaster Crisis Outreach Team (DCORT) and increase the network of mental health responders	X					
AH-20. Provide public information surrounding Radon hazard	X					
AH-21. Encourage municipalities to require radon testing at the time sale of homes	X					
TS-1. Educate municipalities on the importance of streetscape planning and vegetation control such as not planting trees under power lines		X				
TS-2. Sustain tree management programs around power lines	X					
TS-3. Encourage new development planning to include burying of utility cables	X					
F-1. Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County						
F-2. Educate county residents on the NFIP following flood events						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-3. Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-4. Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads			X			Has this activity been integrated into the municipality's normal operations?
F-5. Recommend that municipalities update flood ordinances after the update to the FEMA flood study and flood maps			X			
F-6. Follow state and County stormwater regulations			X			
F-7. Enforce floodplain management ordinances			X			Has this activity been integrated into the municipality's normal operations?
F-8. Implement the Act 167 Plan (Stormwater management)			X			
F-9. Manage integrity and functions of existing regional flood control facilities	X					Has this activity been integrated into the municipality's normal operations?
F-10. Maintain and provide municipalities with updated emergency action plans for high hazard dams			X			
F-11. Develop and implement a model natural conservation ordinance for municipal adoption						Has this activity been integrated into the municipality's normal operations?
F-12. Continue to maintain the stream gauges						Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-13. Continue to maintain the stream gauges within the County						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-14. Install stream gauges if an additional area is identified to benefit from one						<i>Has this activity been integrated into the municipality's normal operations?</i>
F-15. Provide education to the municipalities on flood gauges			X			<i>Has this activity been integrated into the municipality's normal operations?</i>
F-16. Install roadway gates to be closed off flood prone intersections/ roads during flood incidents and signage to warn motorists of the closed road	X					
F-17. Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water	X					
F-18. When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate			X			
F-19. Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs			X			
F-20. Produce a map showing a relative frequency that roads/bridges throughout the county are subject to flooding to use for public outreach and education			X			
F-21. Work with the municipalities to develop a map of the stormwater system, including intakes and outflows			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
F-22. As opportunities arises elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired	X					
WS-1. Provide public information on utility outages and the need to prepare for storms			X			
WS-2. Identify Snow Emergency Routes in all municipalities to increase clearing efforts and travel ability of residents	X					
WS-3. Improve storm drains throughout the County to handle snow melt			X			
WS-4. Plant bushes/other vegetation to stop drifting snow in known problem areas	X					Has this activity been integrated into the municipality's normal operations?
WS-5. Encourage municipalities to adopt an ordinance outlining the process and implement a declaration of a snow emergency						Has this activity been integrated into the municipality's normal operations?
TOR-1 Enhance the Household hazards waste program to reduce post event hazardous debris			X			Has this activity been integrated into the municipality's normal operations?

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TOR-2. Develop a countywide Debris Management Plan						
TOR-3. Provide public information on debris management						<i>Has this activity been integrated into the municipality's normal operations?</i>
TOR-4. Retrofit critical public facilities with safe rooms						<i>Has this activity been integrated into the municipality's normal operations?</i>
D-1. Provide public information on the effects of droughts on public and private wells						<i>Has this activity been integrated into the municipality's normal operations?</i>
D-2. Promote sustainability programs and green practices throughout the County						
D-3. Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-1. Encourage security check of bags/coolers at public gathering						<i>Has this activity been integrated into the municipality's normal operations?</i>



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-2. Plan for and implement strengthened security at public events						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-3. Utilize sheriff K-9 teams for pre-event facility screening at large events						
PG-4. Provide training for public leaders, coaches, referees on conflict de-escalation						
PG-5. Investigate the interaction of public agencies and camera data from private companies/citizens						
PG-6. Purchase temporary mobile camera to set up for events						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-7. Utilize temporary mobile camera during large events to monitor safety and security						<i>Has this activity been integrated into the municipality's normal operations?</i>
PG-8. Inform leaders of large events about the benefits of not providing alcohol at large events						<i>Has this activity been integrated into the municipality's normal operations?</i>

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
PG-9. Continue to train staff to respond to critical incidents and maintain the team of attorneys that is available for large incidents						
PG-10. Increase advanced planning through use of the incident action plan process			X			Has this activity been integrated into the municipality's normal operations?
TRF-1. Work with the railroad industry to address safety concerns and aging rail infrastructure						Has this activity been integrated into the municipality's normal operations?
TRF-2. Provide ongoing cleaning and maintenance of roadways and road signage			X			Has this activity been integrated into the municipality's normal operations?
TRF-3. Utilize municipal and state mobile roadway signs (VMS signs) during emergency events			X			
TRF-4. Install back-up power sources for traffic signals (generator, battery, solar)			X			Has this activity been integrated into the municipality's normal operations?
TRF-5. Coordinate utilization of privately-owned digital billboards for emergency usages	X					Has this activity been integrated into the municipality's normal operations?



Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
TRF-6. Through coordination, stagger traffic during delays/early releases for schools, government, and private sector during a disaster	X					Has this activity been integrated into the municipality's normal operations?
TRF-7. Provide public education on traffic accident reduction	X					Has this activity been integrated into the municipality's normal operations?
TRF-8. Provide public information on the PennDOT color coded detour routes installed around major routes within the County			X			Has this activity been integrated into the municipality's normal operations?
TRF-9. Continue to grow partnerships with public and private transit agencies to utilize their services during emergency situations	X					Has this activity been integrated into the municipality's normal operations?
TRF-10. Enforcement of traffic laws			X			
IL-1. Provide private sector education/outreach related to cyber security best practices						
IL-2. Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers						
IL-3. Purchase backup generators for critical infrastructure/key resources			X			
IL-4. Plan for replenishment fuel for generators			X			
IL-5. Conduct reviews of SARA site plans to ensure they are taking into consideration all of the critical facilities surrounding their site			X			

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
IL-6. Continue to engage the private sector to become involved in emergency preparedness			X			
IL-7. Continue to provide the County HazMat team tours of large SARA facilities within the county to maintain familiarization of facility layouts						

Mitigation Action Plan Review Worksheet- West Nottingham Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for West Nottingham Township			X			
Emergency alerting systems for West Nottingham Township			X			
Install gates to be closed during flood incidents and signage at Fremont Rd between Willow Rd and King Pen Rd	X					On 2015 HMP; currently use portable barriers to close roads
Install gates to be closed during flood incidents and signage at Park Road between Veteran’s Drive and Sand Hill Rd	X					
Generator connection for traffic signal at Rt 272 and Herr Drive				X		
Back-up generator for traffic signal at Rt 272 and Herr Drive				X		
Elevation/Acquisition of structure located at 225 Lees Bridge Rd					X	Remove; we did not add this
Elevation/Acquisition of structure located at 227 Lees Bridge Rd					X	Remove; we did not add this
Elevation/Acquisition of structure located at 245 Park Rd					X	Remove; we did not add this
Elevation/Acquisition of structure located at 247 Park Rd					X	Remove; we did not add this

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Elevation/Acquisition of structure located at 249 Park Rd					X	Remove; we did not add this
Elevation/Acquisition of structure located at 250 Park Rd					X	Remove; we did not add this

Hazard Identification and Risk Evaluation Worksheet

Name: George Turner

Title: EMC

Jurisdiction: **West Whiteland Township**

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	We are seeing larger storms, and therefore increased flooding.
Hurricane and Tropical Storm	I	We are seeing larger storms, and therefore increased flooding.
Radon Exposure	NC	
Thunderstorm	I	We are seeing larger storms, and therefore increased flooding.
Tornado and Windstorm	I	We are seeing larger storms, and therefore increased flooding.
Winter Storm	NC	The increased intensity and frequency of large storms have involved rain, not snow.
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	I	There has been a little more civil disturbance than usual due to reaction to the Mariner East pipelines.



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County's hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Capability Assessment Survey

Jurisdiction: **West Whiteland Township** Point of Contact Name and Title: GEORGE TURNER, EMC
 Phone: 610-636-3351 E-mail: NFTA2000@AOL.COM

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction with the appropriate symbol (Supports, Neutral, or Hinders). Also indicate any change in the ability of the tool or program to affect loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
<i>EXAMPLE: Hazard Mitigation Plan</i>	X	1/1/2008		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	1/27/2016		CCDES	WWT adopted the Chester County Multi-Jurisdictional Hazard Mitigation Plan
Emergency Operations Plan	X	6/27/2012	X	WWT	Resources in the EOP have been updated periodically; entire EOP is currently under review
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP – Community Rating System					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	8/23/2017		WWT	Floodplain regulations were last updated in 2017.



Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Floodplain Management Plan					
Zoning Regulations	X			WWT	Adopted decades ago, updated periodically
Subdivision Regulations	X			WWT	Adopted decades ago, updated periodically
Comprehensive Land Use Plan (or General, Master, or Growth Mgt. Plan)	X	7/12/2019		WWT	WWT's Comp Plan was last amended in 2015 and 2019.
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	1992		WWT	
Stormwater Management Plan / Ordinance	X	12/11/2013		WWT	
Natural Resource Protection Plan	X			WWT	WWT's zoning ordinance includes numerous regulations that protect natural resources, as provided for in the Comprehensive Plan.
Capital Improvement Plan	X	12/11/2019		WWT	A formal transportation CIP was adopted in September 2015. The overall Township CIP is updated annually through the budget process.
Economic Development Plan					
Historic Preservation Plan	X	1982	X	WWT	The zoning ordinance includes regulations to protect historic structures. An update to the historic preservation plan is underway and will be complete in early 2021.
Farmland Preservation					

Tool / Program	Status			Dept./Agency Responsible	Comments
	In Place	Date Adopted or Updated	Under Development		
Building Code	X	5/25/2004		WWT	WWT opted in to enforce the statewide building code in 2004.
Fire Code	X	5/25/2004		WWT	WWT opted in to enforce the statewide building code, which includes the fire code, in 2004.
Other					

2. **Administrative and Technical Capability:** Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an "X" in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Planning & Zoning Dept	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Planning & Zoning Dept Public Works Dept	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Codes Dept	
Emergency Manager	X		Administration	
NFIP Floodplain Administrator	X		Planning & Zoning	
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in GIS and/or FEMA's HAZUS program	X		Planning & Zoning	
Grant writers or fiscal staff to handle large or complex grants	X		Finance Dept Public Works Dept	
Staff with expertise or training in benefit-cost analysis	X		Finance Dept	
Other				

3. **Financial Capability:** Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources **for hazard mitigation purposes** (including as match funds for state or federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		Public Works Dept	
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes		X		
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Public Works Dept	
Stormwater Utility Fees	X		Public Works Dept	Legally these fees are an option but WWT has not adopted a stormwater fee.
Development Impact Fees	X		Planning & Zoning Dept	
General Obligation, Revenue, and/or Special Tax Bonds	X		Finance Dept	
Partnering Arrangements or Intergovernmental Agreements	X		Various	
Other				

4. **Education and Outreach:** Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Then, identify the primary department or agency responsible for its administration or allocation and provide any additional comments you may have in the space provided or with attachments.

Program/Organization	Yes	No	Department/Agency	Comments
Firewise Communities Certification				
StormReady certification				
Natural disaster or safety related school programs				
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		Various	WWT uses various resources for public education, including newsletters, website, social media and community events.
Public-private partnership initiatives addressing disaster-related issues	X			WWT and the West Whiteland Fire Company work together on communications and community events to educate the public on disaster preparedness.
Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X			WWT participates with the Christina Watershed Municipal Partnership and the Chester/Ridley/Crum Watersheds Assn on public info about stormwater.
Other				

5. **Self-Assessment of Capability:** Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "X" in the box marking the most appropriate degree of capability (Limited, Moderate, or High) based on best available information and the responses provided in Sections 1-4 of this survey.

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	X		
Administrative and Technical Capability	X		
Financial Capability	X		
Education and Outreach		X	

WWT note: It depends on the hazard. We have moderate capability to address certain flooding and drainage problems, but nowhere near the financial capacity to acquire the property that would be necessary to implement large scale improvements. We have more limited or capability to address other hazards.

NATIONAL FLOOD INSURANCE PROGRAM SURVEY

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: WEST WHITELAND TOWNSHIP

1. FLOODPLAIN IDENTIFICATION AND MAPPING	Requirement	Recommended Action	Yes/No	Comments
a.	Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	In the Planning & Zoning Dept. office at the Township Building.
b.	Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Y	8/23/2017
c.	Does the municipality support requests for map updates?	If yes, specify how.	Y	Advises landowners on the requirements and process for a map update.
d.	Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Y	Township requires landowners/developers that do flood studies to complete the process for an approved map revision (both LOMA and LOMR) before approving any construction based on the revised information.
e.	Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	The Zoning Officer is the designated floodplain administrator and reviews plans and advises how to seek a map revision if necessary. ZO also completes Elevation Certificates for properties that include floodplains with an established BFE.
f.	Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	Planning & Zoning Dept.



NATIONAL FLOOD INSURANCE PROGRAM SURVEY

2. FLOODPLAIN MANAGEMENT

<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:</p>	<p>If yes, answer questions (1) through (4) below.</p>	<p>Y</p>	
<p>(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHA)?</p>	<p>If yes, specify the office responsible.</p>	<p>Y</p>	<p>Planning & Zoning Dept. (although such development is permitted only by variance).</p>
<p>(2) Does the municipality obtain, review, and utilize any base flood elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?</p>	<p>If yes, specify the office responsible.</p>	<p>Y</p>	<p>Planning & Zoning Dept.</p>
<p>(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?</p>	<p>If yes, specify the office responsible.</p>	<p>Y</p>	<p>Planning & Zoning Dept. (specified information is included in the floodplain regulations of the Zoning Ordinance).</p>
<p>(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?</p>	<p>If yes, specify the office responsible.</p>	<p>Y</p>	<p>The Codes Dept. would be responsible for maintaining such records; however, since we do not allow construction within the SFHA there are no such records.</p>
<p>b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?</p>	<p>If yes, specify how.</p>	<p>Y</p>	<p>The ordinance prohibits development in SFHA's, so enforcement entails denial of permits for building permit applications for structures in a SFHA. Corrections – such as a direction to remove a non-compliant structure – have not been necessary to date.</p>

NATIONAL FLOOD INSURANCE PROGRAM SURVEY

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	<p>If yes, specify activities.</p>	<p>Y</p>	<p>To date, it has been our determination that participation in the CRS would be of such limited benefit that it does not warrant the administrative effort.</p> <p>Our regulations prohibit all development within a SFHA.</p>

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Y	Upon request.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Y	When the FIRM was updated most recently in 2017, we posted information on the Township website and sent letters to the owners of affected properties – which was feasible only since our SFHA area is small and relatively few properties were involved.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Y	Upon request.



Mitigation Action Plan Review Worksheet- West Whiteland Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for West Whiteland Township			X			
Emergency alerting systems for West Whiteland Township			X			
Elevation/Acquisition & demolition of structure located at 113 N. Locust Lane				X		
Elevation/Acquisition & demolition of structure located at 115 N. Locust Lane				X		
Elevation/Acquisition of structure located at 116 N. Locust Lane	X					
Elevation/Acquisition of structure located at 117 N. Locust Lane	X					
Elevation/Acquisition of structure located at 118 N. Locust Lane				X		Property owner retained ownership after elevation.
Elevation/Acquisition of structure located at 117 Valley Road	X					
Elevation/Acquisition of structure located at 118 Valley Road	X					

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Elevation/Acquisition & demolition of structure located at 119 Valley Road				X		
Elevation/Acquisition of structure located at 120 Valley Road	X					
Elevation/Acquisition of structure located at 510 Winding Way	X					
Elevation/Acquisition of structure located at 512 Winding Way	X					
Elevation/Acquisition of structure located at 513 Winding Way	X					
Remove silt/clean Valley Creek bed	X					

Mitigation Strategies for Consideration

Chester County Hazard Mitigation Plan - **Westtown Comments in Red**

Please provide the following information for the update of actions and initiatives for your mitigation strategy. Suggested actions have been developed based on an analysis of Chester County's needs and capabilities or were carried over from the previous hazard mitigation plan (HMP) update. If questions do not apply to your municipality, please indicate with N/A.

Hazards being profiled in the HMP are dam failure, drought and water supply deficiencies, earthquake, environmental hazards (hazardous materials releases), extreme temperatures, flood, flash flood, and ice jams, hurricanes and tropical storms, invasive species, nuclear incident, opioid addiction response, pandemic and infectious disease, environmental hazard gas and liquid pipelines, radon exposure, structural fires, terrorism, tornado and windstorm, transportation accidents, utility interruption, and winter storms.

Please provide as much detail as possible so that mitigation actions can be expanded and customized for your municipality to accurately reflect your capabilities and methods of operation.

1. Which properties in your jurisdiction are most at-risk from flood events and would have the greatest need for retrofitting or other flood hazard mitigation measures? All repetitive loss and severe repetitive loss properties should be included. Specific property addresses need not be listed (to ensure residential privacy), but names of streets or neighborhoods can be included.

- **Roadways/properties along Chester Creek – Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive**
- **Public Infrastructure – WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.**

2. What public outreach and education actions would you be most interested in implementing?

- A. Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.**
- B. Provide hazard and risk reduction information through social media channels and e-mail blast systems.
- C. Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.**
- D. Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.**
- E. Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.**
- F. Encourage private business owners and managers of infrastructure that provide critical services in post-disaster situations to develop Continuity of Operations Plans or Business Continuity Plans.
- G. Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.**
- H. Other:

3. Which roads would benefit from mitigation or structural projects to reduce vulnerability to flood or stormwater incidents? Also, please specify the types of projects that would most help a high-risk road (for example, new/expanded culvert, road elevation, repaving, etc.), if this information is available.

No current issues.

4. What areas in the municipality are still in need of stormwater rehabilitation and upgrades?

No current issues.

5. Which areas of your municipality concern you regarding hazardous materials (HazMat) releases, whether from a fixed facility, pipeline, natural gas wells, or transportation accident?

- Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West Chester, PA 19382) . Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352
- Transportation – There are many critical infrastructures (Schools, daycare, apartment buildings, and nursing home) with vulnerable populations residing/living/working within close distance on Rt. 202 around Skiles Blvd. It includes:
 - Westtown Township Office
 - Westtown East Goshen Regional Police
 - Sunrise of Westtown, Assisted Living Facility
 - Sarah W Starkweather Elementary School
 - Stetson Middle School
 - Westtown KinderCare
 - St. Maximilian Kolbe Catholic Church and School
 - Duckling Early Learning Center Westtown
 -

6. Which roads would benefit from mitigation or structural projects to reduce vulnerability to HazMat incidents? Also, please specify the types of projects that would most help a high-risk road (for example, lower speed limits), if this information is available.

- Rt. 202. Redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge
- There are line of sight issues at the intersection of SR 926 and Avonlea Circle and Tanguy Road.

7. What areas of your municipality have undergone landslides, or are you worried that landslides will happen? What structures or infrastructure is under threat from this?

- No issues

8. Where in your municipality have land subsidence or sinkholes occurred? What facilities or infrastructure is under threat from this?

- No significant issues

9. What facilities are you concerned could be targets of a terrorist attack?

- All schools, public and non-public present a concern for terrorist activities.

10. What roads or intersections in the municipality are considered high-risk and would benefit from improved design, routing, and traffic control functions? To which hazards (if any) are these roads most vulnerable?

- Rt.. 202 at 926 intersection and High Street/202 merge
- Rt. 352/Rt. 3 intersection

11. Which critical facilities still need or would benefit from a backup generator or redundant power supply?

- None identified.

12. In what other mitigation projects are you interested or targeting for completion during the next 5 years? Please provide as much detail as possible.

There are concerns over damage by invasive species and the potential of subsequent wildfire risk. The township woodlands should be surveyed by a forester/wildlands conservation specialist. The Township has demonstrated a continued commitment to open space preservation and is currently developing a Master Plan for Oakbourne Park. In 2018, they completed an Open Space Financing Feasibility Study. As the township looks to preserve more, they are concerned about the assets they have already protected from development in relation to the aforementioned hazards.

The township owns the following open spaces and parks to date:

- Oakbourne Park and Arboretum/Oakbourne Park Athletic Complex
- Tyson Park
- Open Spaces:
 - South Penn Open Space
 - Plumly Farm Open Space
 - Larchbourne Park Open Space

Mitigation Action Worksheet

Municipality(ies):	Action
Westtown Township	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)
Action Number:	
1	
<i>Location (address, lat/long)</i>	1492 Woodtone Road
<i>Mitigation Technique Category</i>	SIP
<i>Hazard(s) Addressed</i>	Flooding
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Mr. Jon Altshul
<i>Title</i>	Township Manager
<i>Agency/Department</i>	Westtown Township
<i>Phone</i>	610-692-1930
<i>E-mail</i>	jaltshul@westtown.org

Mitigation Action Worksheet

Municipality(ies):	Action
Westtown Township	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating wild fire and invasive species risks.
Action Number:	
2	
Location (address, lat/long)	
Mitigation Technique Category	NSP
Hazard(s) Addressed	Wildfire, Invasive Species
Priority (High, Medium, Low)	Medium
Estimated Cost	Medium
Potential Funding Streams	
Timeline	Short
Lead Agency/Department	Westtown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Mr. Jon Altshul
Title	Township Manager
Agency/Department	Westtown Township
Phone	610-692-1930
E-mail	jaltshul@westtown.org

Hazard Identification and Risk Evaluation Worksheet

Name: _Willistown Township_____ Title: _____

Jurisdiction: _____

PART I

Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Natural Hazards		
Drought	NC	
Earthquake	NC	
Extreme Temperatures	NC	
Flood, Flash Flood, and Ice Jam	I	Substantial rainfall amounts have been increasing.
Hurricane and Tropical Storm	NC	
Radon Exposure	NC	
Thunderstorm	NC	
Tornado and Windstorm	NC	
Winter Storm	NC	
Human-made Hazards		
Armed Attacks	NC	
Civil Disturbance	NC	
Conventional/Improvised Bombs	NC	
Cyber Terrorism	NC	
Dam Breaches	NC	



Identified Hazards 2015 HMP	How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community? <i>NC = No Change; I = Increase; D = Decrease</i> <i>(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)</i>	Additional Comments
Extended Utility, Data, or Telecomm Disruptions	NC	
Fires	NC	
Hazard Material Releases	NC	
Nuclear Incidents	NC	
Transportation Accidents	NC	

PART II

Other Hazards:

Do any of the following hazards (not previously profiled in the County’s hazard mitigation plan) have the potential to affect your municipality significantly? If so, please check the box(es) below.

Natural

- | | |
|--|---|
| <input type="checkbox"/> Avalanche/Glacier | <input type="checkbox"/> Lightning Strike |
| <input type="checkbox"/> Coastal Erosion | <input checked="" type="checkbox"/> Pandemic and Infectious Disease |
| <input type="checkbox"/> Dust, Sand Storm | <input type="checkbox"/> Subsidence, Sinkhole |
| <input type="checkbox"/> Expansive Soils | <input type="checkbox"/> Tsunami |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Invasive Species | <input type="checkbox"/> Volcano |
| <input type="checkbox"/> Landslide | |

Human-Caused

- | | |
|---|--|
| <input type="checkbox"/> Building or Structure Collapse | <input type="checkbox"/> Mass Food/Animal Feed Contamination |
| <input type="checkbox"/> Disorientation | <input type="checkbox"/> Terrorism |
| <input type="checkbox"/> Drowning | <input checked="" type="checkbox"/> Utility Interruption |
| <input type="checkbox"/> Levee Failure | <input type="checkbox"/> War and Criminal Activity |

Additional Comments:

Utility interruption due to fallen trees during wind and/or rain events.

Mitigation Action Plan Review Worksheet- Willistown Township

Instructions: List each mitigation action from the existing HMP and identify its status as “No Progress / Unknown, In Progress / Not Yet Complete, Continuous, Completed, or Discontinued.” Include review comments for each action.

Existing Mitigation Action	Status					Review Comments
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
Public Information Programs for Willistown Township		X				We have a very active social media program
Emergency alerting systems for Willistown Township	X					We would use reverse911 if needed, accessed via the county.
Elevation/Acquisition of the structure located at 1 Eisenhower Dr	X					
Elevation/Acquisition of the structure located at 116 Davis Rd	X					
Increase drainage basin size behind Malvern Fire Company	X					
Increase drainage basin size of the Family Life Basin	X					
Increase drainage basin size at Rustmont Homeowners Association	X					
Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd	X					
Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd	X					

Mitigation Strategy 5-Year Mitigation Plan Review

Existing Mitigation Action	Status					Review Comments
	No Progress/Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	X					
Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek	X					
Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd	X					
Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	X					
Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek	X					

Subbio, Tony

From: Chester County EOC <chestercountyec@chesco.org>
Sent: Tuesday, February 11, 2020 10:51 AM
Cc: Ratliff, Gabrielle A.; Ratliff, Gabrielle A.; DESRAD1
Subject: Chester County Hazard Mitigation Plan

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Dear Chester County Hazard Mitigation Plan Update Steering Committee Members,

Chester County has begun the process to update our Hazard Mitigation Plan to comply with Commonwealth and federal requirements. This plan update will cover a five year period starting in 2020. As part of this process, we have contracted with Tetra Tech to lead the project. As a key stakeholder in mitigation planning, I would like to request your assistance in serving on the Steering Committee of this plan update.

The Steering Committee's responsibility is to provide strategic direction during the planning process. The Steering Committee will be responsible for working with municipalities and other members of the Planning Team (the group of all stakeholders involved in the planning process), conducting outreach, identifying goals and objectives for the plan, and working with the municipalities to gather information and develop the plan. That is not to say that the Steering Committee members are going to do all of the work- it is really more that the Steering Committee will assist Tetra Tech in getting it done, helping whenever we hit a roadblock.

This first step in the update will be a kickoff meeting with Tetra Tech to discuss the project and scope of work. The meeting will take place on **February 20, 2020 from 2:00-4:00 p.m.** at the **Chester County Government Services Center, Conference Room 42, 601 Westtown Road, West Chester, PA 19382.** As the project progresses, the Steering Committee will have periodic meetings via phone or in person to evaluate the status of the update and provide feedback on hazards or mitigation strategies brought up by stakeholders, as well as final review of the draft plan prior to submission to the Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA).

Your participation on this committee will not require a great deal of time, but will be instrumental in assisting our office in updating this plan. If you have any questions, please feel free to reach out.

Thank you,

Gabby Ratliff
Emergency Planning Coordinator
610.344.5042
gratliff@chesco.org

The Mission of the Department of Emergency Services is to Promote and Assist in Providing Safety and Security to Chester County Residents so they can Work, Live and Grow in a Healthy and Safe Community.



THE COUNTY OF CHESTER



COMMISSIONERS
Marian D. Moskowitz
Josh Maxwell
Michelle Kichline

DEPARTMENT OF EMERGENCY SERVICES
Government Services Center
601 Westtown Road, Suite 012
West Chester, PA 19380-0990
(610) 344-5000 • Fax (610) 344-5050
www.chesco.org/des
Michael P. Murphy Jr., Director

February 26, 2020

RE: Chester County Multijurisdictional Hazard Mitigation Plan 2020 Update

Dear Borough Council/City Council/Township Supervisors,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so the Hazard Mitigation Committee facilitated by Chester County Department of Emergency Services has begun our 5-year update of the HMP.

Because this plan serves as each municipalities' HMP, your participation in the planning process is crucial to the integrity of the plan. We encourage you to decide upon one or two individuals to serve as your representatives during the planning process. It is recommended that your designee(s) have a comprehensive understanding of your borough or township as this person will act as the conduit between the municipality and the Planning Team. Please note that we will be asking for input on how your community has changed and what mitigation capabilities or actions have been accomplished over the past 5 years.

We will be conducting a HMP Planning Team Kickoff Meeting for municipal representatives on Friday, March 13, 2020. The meeting will be held in Conference Room 351 at the Government Services Center, 601 Westtown Rd, West Chester, PA from 10a.m. to 12p.m. If you cannot attend the morning session, you may attend the meeting for other community stakeholders which will be from 1:00-3:00p.m.

At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Please have someone from your organization attend and participate in this first step of the planning process.

Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator

Subbio, Tony

From: Chester County EOC <chestercountyeoc@chesco.org>
Sent: Wednesday, February 26, 2020 1:57 PM
To: Ratliff, Gabrielle A.; Ratliff, Gabrielle A.
Cc: Turner, William; Turner, William; DESRAD1
Subject: 2020 Chester County Hazard Mitigation Plan Kickoff Invitation

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Dear Borough Council/City Council/Township Supervisors and Staff,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so the Hazard Mitigation Committee facilitated by Chester County Department of Emergency Services has begun our 5-year update of the HMP.

Because this plan serves as each municipalities' HMP, your participation in the planning process is crucial to the integrity of the plan. We encourage you to decide upon one or two individuals to serve as your representatives during the planning process. It is recommended that your designee(s) have a comprehensive understanding of your borough, township, or city as this person will act as the conduit between the municipality and the Planning Team. Please note that we will be asking for input on how your community has changed and what mitigation capabilities or actions have been accomplished over the past 5 years.

We will be conducting the HMP Planning Team kickoff meeting for municipal representatives on **Friday, March 13, 2020**. The meeting will be held in **Conference Room 351 at the Government Services Center**, 601 Westtown Rd, West Chester, PA from **10 a.m. to 12 p.m.** If you cannot attend the morning session, you may attend the meeting for other community stakeholders which will be from 1p.m. to 3p.m. at the same location. Attached is your official invitation to this meeting.

At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Please have someone from your organization attend the meeting and participate in this first step of the planning process.

Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
(P): 610.344.5042

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, February 26, 2020 3:29 PM
Subject: 2020 Hazard Mitigation Plan Update Meeting Invitation

⚠ CAUTION: This email originated from an external sender. Verify the source before opening links or attachments. **⚠**

Good afternoon Emergency Management Coordinators,

Attached is the letter that has been sent to municipal officials and staff about the Hazard Mitigation Plan Update Kickoff Meeting which will be on Friday, March 13, 2020. The meeting for municipalities will be held in Conference Room 351 at the Government Services Center, 601 Westtown Rd, West Chester, PA from 10a.m. to 12p.m. If you cannot attend the morning session, you may attend the afternoon session for community stakeholders which will be from 1:00-3:00p.m. in the same location.

At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Please coordinate with your municipal leadership and determine who will be the best representatives for this project. If you have any questions, please let me know.

Thank you,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des

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THE COUNTY OF CHESTER



COMMISSIONERS
Marian D. Moskowitz
Josh Maxwell
Michelle Kichline

DEPARTMENT OF EMERGENCY SERVICES
Government Services Center
601 Westtown Road, Suite 012
West Chester, PA 19380-0990
(610) 344-5000 • Fax (610) 344-5050
www.chesco.org/des
Michael P. Murphy Jr., Director

February 26, 2020

RE: Chester County Hazard Mitigation Plan 2020 Update

Dear Chester County Planning Stakeholders,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so we have begun our 5-year update of the HMP.

We will be conducting a kickoff meeting for the HMP Planning Team on Friday, March 13, 2020. The meeting will be held in Conference Room 351 at the Government Services Center, 601 Westtown Rd, West Chester, PA from 1:00-3:00p.m. At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Your participation in the development of this plan is important to us as your organization plays an important role in our community. We are eager to have your feedback inform the Chester County Hazard Mitigation Plan.

Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Gabby Ratliff".

Gabby Ratliff
Emergency Planning Coordinator

Subbio, Tony

From: Chester County EOC <chestercountyec@chesco.org>
Sent: Wednesday, February 26, 2020 5:53 PM
To: Ratliff, Gabrielle A.
Cc: DESRAD1
Subject: 2020 Hazard Mitigation Plan Update Kickoff Meeting Invitation

⚠ CAUTION: This email originated from an external sender. Verify the source before opening links or attachments. **⚠**

Good afternoon School Districts and Universities,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so we have begun our 5-year update of the HMP.

We will be conducting a kickoff meeting for the HMP Planning Team on **Friday, March 13, 2020**. The meeting will be held in **Conference Room 351 at the Government Services Center**, 601 Westtown Rd, West Chester, PA from **1:00-3:00p.m.** At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Your participation in the development of this plan is important to us as your organization plays an important role in our community. We are eager to have your feedback inform the Chester County Hazard Mitigation Plan.

Attached is the official invitation. Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
(P): 610.344.5042

The Mission of the Department of Emergency Services is to Promote and Assist in Providing Safety and Security to Chester County Residents so they can Work, Live and Grow in a Healthy and Safe Community.

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Subbio, Tony

From: Chester County EOC <chestercountyec@chesco.org>
Sent: Wednesday, February 26, 2020 6:00 PM
To: Ratliff, Gabrielle A.
Cc: DESRAD1
Subject: 2020 Hazard Mitigation Plan Update Kickoff Meeting Invitation

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Good afternoon Hospitals, Nursing Homes, and Long Term Care Facilities,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so we have begun our 5-year update of the HMP.

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Subbio, Tony

From: Chester County EOC <chestercountyeoc@chesco.org>
Sent: Wednesday, February 26, 2020 5:43 PM
To: Ratliff, Gabrielle A.
Cc: Turner, William; DESRAD1
Subject: 2020 Hazard Mitigation Plan Update Kickoff Meeting Invitation

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Good afternoon Police and Fire Chiefs and EMS Captains,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so we have begun our 5-year update of the HMP.

We will be conducting a kickoff meeting for the HMP Planning Team on **Friday, March 13, 2020**. The meeting will be held in **Conference Room 351 at the Government Services Center**, 601 Westtown Rd, West Chester, PA from **1:00-3:00p.m.** At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Your participation in the development of this plan is important to us as your organization plays an important role in our community. We are eager to have your feedback inform the Chester County Hazard Mitigation Plan.

Attached is the official invitation. Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting.

Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
(P): 610.344.5042

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received this e-mail message in error, please immediately notify the sender by reply e-mail and delete the message.
Thank you very much.

Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Thursday, February 27, 2020 11:45 AM
To: 'jmeisel@tmacc.org'; 'jon@tmacc.org'; 'robkennedy@pa.gov'; 'jfelion@pa.gov'; 'c-rwhittin@pa.gov'; 'c-aferrell@pa.gov'
Cc: Subbio, Tony; Otley, Stefanie
Subject: 2020 Hazard Mitigation Plan Update Kickoff Meeting

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Good morning Chester County Planning Stakeholders,

The Chester County Hazard Mitigation Plan (HMP) was last updated in 2015 and adopted by the County Commissioners on January 5, 2016. The HMP is going to expire at beginning of 2021, so we have begun our 5-year update of the HMP.

We will be conducting a kickoff meeting for the HMP Planning Team on **Friday, March 13, 2020. The meeting will be held in Conference Room 351 at the Government Services Center, 601 Westtown Rd, West Chester, PA from 1:00-3:00p.m.** At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. Your participation in the development of this plan is important to us as your organizations play an important role in our community. We are eager to have your feedback inform the Chester County Hazard Mitigation Plan.

Attached is the official invitation. If you are not a relevant point of contact, please forward this to any parties you believe should be participating in the planning process for this update.

Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Thursday, February 27, 2020 10:50 AM
To: Szabo, Ernest; 'mari.radford@fema.dhs.gov'; 'Emma Giardina'; 'jwilson@montcopa.org'; 'BoyceT@co.delaware.pa.us'; 'stforster@co.bucks.pa.us'
Cc: Subbio, Tony; Otley, Stefanie
Subject: 2020 Chester County Hazard Mitigation Update Kickoff Meeting

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Good morning Emergency Management Partners,

We will be conducting a kickoff meeting for the HMP Planning Team on **Friday, March 13, 2020**. The meeting will be held in **Conference Room 351 at the Government Services Center, 601 Westtown Rd, West Chester, PA from 1:00-3:00p.m.** At this meeting, we will be discussing the planning process, timeline, municipal participation requirements, and stakeholder outreach and participation. We are eager to have your perspectives inform the Chester County Hazard Mitigation Plan.

Attached is the invitation we are sending to stakeholders. Please forward this to those individuals who work closely with hazard mitigation planning within your organization. Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,



Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Thursday, February 27, 2020 11:56 AM
To: Subbio, Tony; Otley, Stefanie; Bokovitz, Patrick E.; Bowers, Janet L.; Nelson, Zachary E.; Trego, Cory T.; Turner, William; Zettlemyer, Cameron S.; Zeis, Janet; Sekkes, David; Stauffer, Carol J.; Patriarca, Christopher R.; Conwell, Carolyn J.; Slater, Robyn E.; Thomas, Craig A.
Subject: 2020 Chester County Hazard Mitigation Update Kickoff Meeting

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Hello HMP Steering Committee:

Attached is the invitation to attend our Planning Team Kickoff Meeting on **Friday, March 13 in Conference Room 351 at the Government Services Center**, 601 Westtown Rd, West Chester, PA from **1:00-3:00p.m.** I have sent it to our distribution lists for municipal officials and staff, EMC's, schools and universities, first responder leadership, health care facilities, TMACC and PennDOT, and emergency management planning partners at the regional, state, and federal level. After our meeting, we identified other key stakeholder groups we would like to involve in the planning process such as:

- **Business, Economic, and Private Sector Groups:** (i.e. Chambers of Commerce, Economic Development Council, and Chester County FIRST)
- **Community Interest and Service Groups** (i.e. La Comunidad Hispania, United Way, Historical Societies)
- **Environmental and Conservation Groups:** (i.e. Red Clay Alliance, Brandywine Conservancy, Natural Lands, Agricultural Groups)

At this point, I would like to leverage what relationships you have with these types of organizations within the community. Please forward this letter to *any* organization you deem appropriate. For documentation purposes, I ask that you either copy me on the email or send me a list of contacts that you have reached out to with the invite. If you have any questions or if I can help in anyway, please let me know.

Thank you all very much for your support with this project.

Regards,

Gabby Ratliff

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, March 4, 2020 3:59 PM
Cc: Subbio, Tony; Otley, Stefanie
Subject: 2020 Chester County Hazard Mitigation Plan Kickoff Meeting

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Good afternoon Chester County Planning Stakeholders,

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Thank you for your support, and we look forward to seeing you at the Planning Team Kickoff Meeting. Please contact me if you have any questions.

Sincerely,

Gabby Ratliff
Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, June 17, 2020 1:56 PM
To: Subbio, Tony; Otley, Stefanie
Cc: Turner, William
Subject: FW: Chester County Hazard Mitigation Plan Update-Municipal Input/Feedback

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From: EOC PIO <eoc-pio@chesco.org>
Sent: Wednesday, June 17, 2020 1:54 PM
To: EOC PIO <eoc-pio@chesco.org>
Cc: Ratliff, Gabrielle A. <gratliff@chesco.org>; DESRAD1 <desrad1@chesco.org>
Subject: Chester County Hazard Mitigation Plan Update-Municipal Input/Feedback

Municipal Managers

I hope you are doing well, and that you and your families are staying healthy. As things start to settle down, I wanted to touch base with you again about the Hazard Mitigation Plan (HMP). As you may remember, we had a webinar on March 13 to kick off the planning process with the municipalities. Thank you again to everyone who attended the webinar.

A big part of the planning process is that we need to collect some information from each municipality. To do that, we are using a few standard worksheets developed by PEMA and FEMA. The forms are:

1. [Hazard Identification and Risk Evaluation Worksheet](#) – to tell us how your municipality’s vulnerability to different hazards has changed
2. [Capability Assessment Survey](#) – to tell us about the plans, regulations, staff, and other resources you have that can be used to mitigate hazards
3. [National Flood Insurance Program \(NFIP\) Survey](#) – to document how your municipality administers its floodplain management program
4. [Mitigation Strategy Review Worksheet](#) – to provide feedback on the goals and objectives of the 2015 HMP, and to report progress on countywide actions that your municipality adopted
5. [Municipal Strategy Review Worksheet](#) – to report progress on the municipality-specific actions and projects that were included in the 2015 HMP

These worksheets can be found on HMP project website, at <https://www.chestercountypahmp.com/municipal-information/>. Please visit the site, download the five worksheets, complete them, and return them to me or our consultant, Tony Subbio from Tetra Tech.

Please work with your fellow officials to fill out and return these worksheets to me by **Friday, July 3**.

If you have any questions, please contact me or Tony Subbio, our consultant from Tetra Tech. He can be reached at tony.subbio@tetrattech.com.

Thank you!

Gabby Ratliff

Emergency Planning Coordinator
Chester County Department of Emergency Services
601 Westtown Road
West Chester, PA 19380
484-402-3429



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From: [Ratliff, Gabrielle A.](#)
To: [Ratliff, Gabrielle A.](#)
Cc: [Subbio, Tony](#); [Groover, Mike A.](#)
Subject: Chester County Hazard Mitigation Plan 2020 Update- Risk Assessment Review
Date: Monday, October 26, 2020 2:19:18 PM
Attachments: [image001.png](#)

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**Municipal Elected Officials
Municipalities
Emergency Management Coordinators**

Good afternoon,

As you know, the Chester County Hazard Mitigation Plan (HMP) is currently being updated. We conducted a pair of kickoff webinars on March 13, 2020. Since that time, we have been analyzing the hazards that affect our communities and updating the risk assessment portion of the plan. The pandemic slowed our progress, but we have now completed our analysis.

We will review the results of the updated risk assessment at a pair of identical webinars on **Monday, November 9, 2020**. To maximize the chance for municipal, stakeholder, and public participation, one webinar will be held from **10:00 a.m. – 12:00 p.m.**; the other will be held from **6:00-8:00 p.m.** You can find the links to the webinars on the Calendar at www.chestercountypahmp.com.

Please encourage someone from your organization to attend one of the webinars and participate in the discussion. As a reminder, attendance at a planning meeting such as this one is a requirement to be eligible to adopt the HMP for your municipality.

Thank you for your continued support, and we look forward to hearing from you at a webinar. Please contact me at (610) 344-5042 if you have any questions.

Sincerely,

Gabrielle Ratliff
Community Resilience Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des



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From: [Ratliff, Gabrielle A.](#)
To: [Ratliff, Gabrielle A.](#)
Cc: [Subbio, Tony](#); [Groover, Mike A.](#)
Subject: 2020 Chester County Hazard Mitigation Plan Update- Risk Assessment Review
Date: Monday, October 26, 2020 4:39:02 PM
Attachments: [image001.png](#)

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Hospitals
Long-Term Care Facilities
Responders
Businesses
Non-Profit
Utilities
Safe School Representatives
Superintendents
Universities

Dear Chester County Planning Stakeholders,

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Sincerely,

Gabby Ratliff
Community Resilience Coordinator
Chester County Department of Emergency Services
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610.344.5042 (office)
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LEGAL NOTICES

to submit a letter of interest and a copy of their resume or biography to Dana DiDoménico, via email danad@west-chester.com. Interested individuals will be contacted to schedule an interview. Deadline for submission is November 27, 2020. DLN 11/6; 1a

11/6/20
Daily Local News

Chester County is updating its Hazard Mitigation Plan (HMP). The HMP is designed to make our communities more resistant to losses from natural and man-made disasters, and to enable the County and municipalities to be eligible for federal funding for qualifying mitigation projects. There will be a pair of public webinars to review the updated risk assessment from 10:00 a.m.-12:00 p.m. and from 6:00-8:00 p.m. on November 9, 2020. All interested residents, businesses, or stakeholders are invited to attend one of the two webinars. Please visit the Calendar at <https://www.chestercountypahmp.com/> for the meeting links. For more information, contact Gabby Ratliff, Community Resilience Coordinator, Chester County Department of Emergency Services, at (610) 344-5042 DLN 11/6; 1a

Economy Self Storage Public Auction

NOTICE IS HEREBY GIVEN that the contents of the following rental units located at Economy Self Storage 3016 Horseshoe Pike, Honey Brook, PA 19344 will be sold through a public online auction to satisfy the owners' lien, pursuant to the PA Self-Service Storage Facilities Act at www.Lockerfox.com on November 19, 2020 @ 12:00 pm for non-payment of rent. Auctions are available online.

Terms: Cash. Buyers have 72 hours to remove items from premises. We reserve the right to reject all bids. Contents may include household, business, furniture, and miscellaneous items and vehicles.


OP12 Joshua Rader
52 Dennis Sandoe
91 Amelia Tomarchio
DLN 11/6, 11/12; 1a

Envara Health, Inc., a foreign business corporation incorporated under the laws of Delaware, with its princ. office located at 701 Lee Rd., Ste. 210, Wayne, PA 19087, has applied for a Statement of Registration to do business in Pennsylvania under the provisions of Chapter 4 of the Association Transactions Act. The street address in the association's jurisdiction of formation is 251 Little Falls Dr., Wilmington, DE 19808. The registered office in PA is located at 701 Lee Rd., Ste. 210, Wayne, PA 19087, and shall be deemed for venue and official publication purposes to be located in Chester County. DLN 11/6; 1a

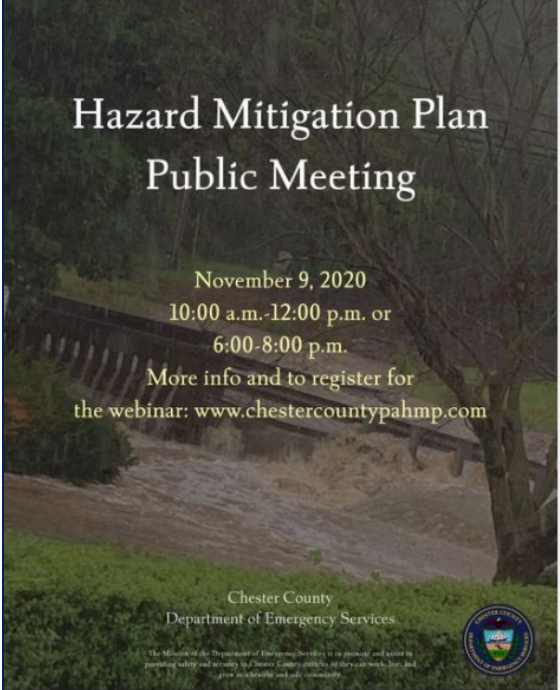
INVITATION TO BID NOTICE FOR THE COUNTY OF CHESTER: November 25th, 2020

The County of Chester solicits bids for Replace Domestic Hot Water Tanks at the Prison, Bid #357011-1372E (Plumbing) and #357011-1373E (Electrical).

You may obtain a complete copy of the Invitation to Bid from the Department of Procurement and General Services for a non-refundable fee of \$25.00 or at no charge from our website at chesco.org. If

 **Chester County Department of Emergency Services** ...
November 2 at 6:00 PM · 🌐


Chester County DES is hosting a public webex meeting to review the risk assessment portion of the Hazard Mitigation Plan. This risk assessment determines the County's risk for natural or man-made disasters and informs the process of identifying potential mitigation projects.



Hazard Mitigation Plan Public Meeting

November 9, 2020
10:00 a.m.-12:00 p.m. or
6:00-8:00 p.m.
More info and to register for
the webinar: www.chestercountypahmp.com

Chester County
Department of Emergency Services



The Mission of the Department of Emergency Services is to prevent and assist in preventing safety and security in Chester County through all the ways we live, and grow, together and as a community.

👍 5 4 Shares

 **Chester County Department of Emergency Services** ...
November 4 at 10:02 AM · 🌐

Chester County DES is hosting a public webex meeting to review the risk assessment portion of the Hazard Mitigation Plan. This risk assessment determines the County's risk for natural or man-made disasters and informs the process of identifying potential mitigation projects.



Hazard Mitigation Plan Public Meeting


November 9, 2020
10:00 a.m.-12:00 p.m. or
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More info and to register for
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Chester County
Department of Emergency Services



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👍 5 1 Share

 **Chester County Department of Emergency Services** ...
November 8 at 12:01 PM · 🌐


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Hazard Mitigation Plan Public Meeting

November 9, 2020
10:00 a.m.-12:00 p.m. or
6:00-8:00 p.m.
More info and to register for
the webinar: www.chestercountypahmp.com

Chester County
Department of Emergency Services



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👍 1 1 Share

From: [Ratliff, Gabrielle A.](#)
To: [Subbio, Tony](#)
Cc: [Mains, Patricia G.](#); [Groover, Mike A.](#); [Chumley, Stefanie](#)
Subject: Chester County Hazard Mitigation Plan Update- Mitigation Strategy
Date: Monday, November 30, 2020 4:49:42 PM
Attachments: [image001.png](#)

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Municipal Elected Officials
Municipalities
Emergency Management Coordinators

Dear Municipal Elected Officials, Municipal Administrators, and local Emergency Management Coordinators,

As you know, the Chester County Hazard Mitigation Plan (HMP) is currently being updated. We conducted a pair of kickoff webinars on March 13, 2020, and reviewed the results of the updated risk assessment at a pair of webinars on November 9, 2020. We are now ready to develop implementable mitigation actions for inclusion in the updated HMP based on the results of the risk and capabilities assessments. If you have not had an opportunity to review the updated risk assessment, you can find the hazard profiles on the project website, <https://www.chestercountypahmp.com/>, under the "Draft Documents for Review" tab.

To review our capabilities to mitigate the impacts of hazards and help our municipalities identify mitigation actions for inclusion in the HMP, we will be conducting a Mitigation Strategy Workshop webinar on Wednesday, December 9, 2020, from 10:00 a.m. to 12:00 p.m. You can find the link to the webinar on the Calendar at www.chestercountypahmp.com.

I would appreciate it if someone from your organization would attend the webinar and participate in the discussion. Please contact me at (610) 344-5042 if you have any questions.

Thank you for your continued support, and we look forward to hearing from you on the webinar.

Respectfully,

Gabby Ratliff
Community Resilience Coordinator
Chester County Department of Emergency Services
601 Westtown Road, Suite 012
West Chester, PA 19380
484.402.3429 (cell)
610.344.5042 (office)
www.chesco.org/des



The Mission of the Department of Emergency Services is to Promote and Assist in Providing Safety and Security to Chester County Residents so they can Work, Live and Grow in a Healthy and Safe Community.

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From: [Ratliff, Gabrielle A.](#)
To: [Subbio, Tony](#)
Cc: [Mains, Patricia G.](#); [Groover, Mike A.](#)
Subject: Chester County Hazard Mitigation Plan Update- Mitigation Strategy
Date: Tuesday, December 1, 2020 8:47:45 AM
Attachments: [image001.png](#)

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Fire Chief
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Dear Planning Stakeholders,

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From: [Ratliff, Gabrielle A.](#)
To: [Subbio, Tony](#)
Cc: [Mains, Patricia G.](#); [Groover, Mike A.](#); [Chumley, Stefanie](#)
Subject: Chester County Mitigation Strategy Workshop
Date: Tuesday, December 8, 2020 5:30:35 PM
Attachments: [image001.png](#)
[Goals and Objectives DRAFT 120220.pdf](#)
[Chester County Problem Statements 120720.pdf](#)
[Chester HMP - Muni Risk Factor Analysis.pdf](#)
[Chester Co Mitigation Actions Handout.pdf](#)
[Chester HMP - Mit Strat Workshop 120920 PPT.pdf](#)
[Mitigation Action Worksheet.docx](#)
[Chester HMP - Mit Strat Workshop 120920 Agenda.pdf](#)

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Municipal Elected Officials
Municipalities
Emergency Management Coordinators

Good Evening Municipal Elected Officials, Administrators, and Emergency Management Coordinators,

This email is to remind you of the Mitigation Strategy Workshop webinar we are hosting tomorrow, **Wednesday, December 9, 2020, from 10:00 a.m. to 12:00 p.m.** The objectives of this workshop are to review our mitigation capabilities and to help municipalities identify mitigation actions for inclusion in the Hazard Mitigation Plan. Below is the link to the meeting.

[Join Microsoft Teams Meeting](#)

+1 443-692-5804 United States, Baltimore (Toll)

Conference ID: 950 281 110#

Attached are the materials for the meeting. For more information, please visit our plan update webpage at: www.chestercountypahmp.com. Thank you for all of the feedback we have received so far, and we hope to see you there!

Thanks again,

Gabby Ratliff
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From: [Ratliff, Gabrielle A.](#)
To: [Subbio, Tony](#)
Cc: [Groover, Mike A.](#)
Subject: Chester County Mitigation Strategy Workshop
Date: Tuesday, December 8, 2020 5:46:37 PM
Attachments: [image001.png](#)
[Goals and Objectives DRAFT 120220.pdf](#)
[Chester County Problem Statements 120720.pdf](#)
[Chester HMP - Muni Risk Factor Analysis.pdf](#)
[Chester Co Mitigation Actions Handout.pdf](#)
[Chester HMP - Mit Strat Workshop 120920 PPT.pdf](#)
[Mitigation Action Worksheet.docx](#)
[Chester HMP - Mit Strat Workshop 120920 Agenda.pdf](#)

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, March 10, 2021 12:55 PM
To: Subbio, Tony
Cc: Turner, William; Tinsman, Kelly E.; Mains, Patricia G.; Chumley, Stefanie
Subject: Chester County Hazard Mitigation Plan Update - Public Webinar

Follow Up Flag: Follow up
Flag Status: Completed

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We have now completed the draft of the updated HMP. The draft HMP is available for review on the project website, <https://www.chestercountypahmp.com/>, under the “Draft Documents for Review” link. Please visit the site and review the documents posted there.

We will be conducting a public webinar to collect comments on the draft HMP. **The webinar will be on Wednesday, April 7, 2021, from 6:00-8:00 p.m.** It will be conducted via Microsoft Teams; you do not need to download any software to participate. Details for logging into the webinar are provided on the Calendar on the HMP website and are below:

Microsoft Teams meeting

Join on your computer or mobile app

[Click here to join the meeting](#)

Or call in (audio only)

1 443-692-5804,,644493708# United States, Baltimore

Phone Conference ID: 644 493 708#

I would appreciate it if someone from your organization would attend the webinar and participate in the discussion. If you are unable to attend, please send your comments on the draft to myself and Tony Subbio, the project manager for the update (Tony.Subbio@tetrattech.com), by April 6, 2021.

Thank you for your support, and we look forward to hearing from you during the webinar. Please contact me at (610) 344-5042 if you have any questions.

Sincerely,

Gabby Ratliff
Community Resilience Coordinator
Chester County Department of Emergency Services
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From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, March 10, 2021 12:55 PM
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Cc: Mains, Patricia G.; Turner, William; Chumley, Stefanie; Tinsman, Kelly E.
Subject: Chester County Hazard Mitigation Plan Update - Public Webinar

Follow Up Flag: Follow up
Flag Status: Completed

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Municipal Elected Officials Municipalities Emergency Management Coordinators

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Public Notice for the April 7, 2021 Plan Draft Review Meeting, published on March 15, 2021

Mail 8:07 AM Mon Mar 15 LTE 100%

dailylocal-pa.newsmemory.com

West Chester Daily Local News Home - Chester County Hazard Mitigation Plan Update

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...in the meeting through the
...WebEx platform but would
...like to provide public com-
...ment on any agenda item, you
...may email your comments to
...admin1@charlestown.pa.us
...prior to the meeting.
...DLN 3/15; 1a

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NOTICE

...N, the Charles-
...ip Board of
...ill hold a vir-
...eting on April
...0 p.m. to con-

The 2021 Chester County Hazard Mitigation Plan (HMP) update is complete. The HMP documents the risks faced by the county and its communities, an analysis of stakeholder capabilities, and goals to reduce vulnerability across the county. The draft HMP is available for review at www.chestercountypahmp.com. There will be a public webinar to collect comments on the draft HMP on Wednesday, April 7, 2021, from 6:00-8:00 p.m. Details about the webinar can be found on the website above. Interested parties are invited to attend the webinar and provide comments. Please contact Gabby Ratliff, Chester County Department of Emergency Services at (610) 344-5042 with any questions.
DLN 3/15; 1a

ESTATE NOTICES

ESTATE NOTICE
ESTATE OF COLLEEN ANN TILLET, AKA COLLEEN A. HARTMAN, COLLEEN A. TILLET, COLLEEN A. SAYER, late of Chester Springs, Pennsylvania, deceased.
Letters Testamentary on the Estate of the above-named Colleen Ann Tillett, aka Colleen A. Hartman, aka Colleen A. Tillett, aka Colleen A.

Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, April 7, 2021 3:52 PM
To: Subbio, Tony
Subject: Chester County Hazard Mitigation Plan Public Meeting - Reminder

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Fire Chief
Law Enforcement
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Non Public Schools
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Transportation
Community Organizations

Good afternoon Community Stakeholders,

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Microsoft Teams meeting

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Or call in (audio only)

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Subbio, Tony

From: Ratliff, Gabrielle A. <gratliff@chesco.org>
Sent: Wednesday, April 7, 2021 1:49 PM
To: Subbio, Tony
Subject: Hazard Mitigation Plan Public Meeting - Reminder

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Chester County Department of Emergency Services

April 6 at 6:00 PM · 🌐



The Chester County Hazard Mitigation Plan Public Review and Comment Period is in progress. A virtual public meeting to discuss the final version will be held Wednesday April 7, from 6pm to 8pm. To review the plan and for meeting information, please visit www.chestercountypahmp.com Input or questions about the plan, please email gratliff@chesco.org



👍👎 9

7 Shares



Chester County Department of Emergency Services

22h · 🌐



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1 Comment 7 Shares

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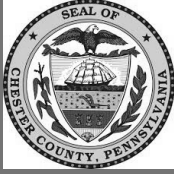


Andrew Keyes

Shouldn't that guy turn around so he doesn't drown?

Like · Reply · 16h

👍 1



Chester County Hazard Mitigation Plan Update - Academia Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a "blueprint" by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Academia Survey

Please answer the following questions about hazards and how they affect schools, school districts, and higher education facilities in Chester County. Please provide as much information as possible. Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of your Academic Institution (school, district, higher education institution):

2. Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is countywide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
| <input type="checkbox"/> Elverson (B) | <input type="checkbox"/> East Vincent (Twp) | <input type="checkbox"/> Upper Uwchlan (Twp) |
| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
| <input type="checkbox"/> Kennett Square (B) | <input type="checkbox"/> Easttown (Twp) | <input type="checkbox"/> Valley (Twp) |
| <input type="checkbox"/> Malvern (B) | <input type="checkbox"/> Elk (Twp) | <input type="checkbox"/> Wallace (Twp) |
| <input type="checkbox"/> Modena (B) | <input type="checkbox"/> Franklin (Twp) | <input type="checkbox"/> Warwick (Twp) |
| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
| <input type="checkbox"/> Parkesburg (B) | <input type="checkbox"/> Honey Brook (Twp) | <input type="checkbox"/> West Brandywine (Twp) |
| <input type="checkbox"/> Phoenixville (B) | <input type="checkbox"/> Kennett (Twp) | <input type="checkbox"/> West Caln (Twp) |
| <input type="checkbox"/> South Coatesville (B) | <input type="checkbox"/> London Britain (Twp) | <input type="checkbox"/> West Fallowfield (Twp) |
| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
| <input type="checkbox"/> Caln (Twp) | <input type="checkbox"/> New London (Twp) | <input type="checkbox"/> West Pikeland (Twp) |
| <input type="checkbox"/> Charlestown (Twp) | <input type="checkbox"/> Newlin (Twp) | <input type="checkbox"/> West Sadsbury (Twp) |
| <input type="checkbox"/> East Bradford (Twp) | <input type="checkbox"/> North Coventry (Twp) | <input type="checkbox"/> West Vincent (Twp) |
| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
| <input type="checkbox"/> East Caln (Twp) | <input type="checkbox"/> Pennsbury (Twp) | <input type="checkbox"/> Westtown (Twp) |
| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

3. How many faculty members work at your academic institution?

4. How many students attend your academic institution?

5. During the school year, how many students reside on campus?

6. Has your academic institution been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Yes

No

If you answered "YES", please identify the events and provide a brief description of the damages or loss of service

7. Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, sinkholes, etc.)?

Yes

No

I don't know

Please explain

8. Do you believe that your facilities and associated infrastructure are disaster-resistant, or capable of withstanding a natural disaster (e.g. are properly located and constructed, and have back-up power as appropriate)?

- Yes
- No
- I don't know

Please explain

9. If your facility is an American Red Cross (ARC) designated shelter, do you believe they are adequately designed and equipped to support sheltering during and after hazard events? Do your facilities have generator capabilities to support the ARC shelter?

- Yes
- No

Please explain

10. If you answered yes to the question above, what is the capacity of the shelter?

11. Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards?

- Yes
- No
- I don't know

Please explain



Chester County Hazard Mitigation Plan Update - Academia Survey

12. Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support your academic functions during and after hazard events?

- Yes
- No
- I don't know

Please explain

13. Looking at the facilities you own/operate, are there facilities that DO NOT have backup power generation capabilities? If yes, please identify those facilities.

14. What mass notification/texting system does your institution use to send information to students and parents, if any?

15. Do you think that weather forecasts and announcements of road closures and pending road closures are sufficiently accurate and available to support your institution's operation and student transportation decisions in the event of hazard events?

- Yes
- No
- I don't know

Please explain

16. Do you believe that emergency response planning, services, and equipment are capable of managing and responding properly to disasters in your community?

- Yes
- No
- I don't know

Please explain

17. Do you believe that local government understands, supports, and possesses adequate resources for hazard risk reduction efforts in the community?

- Yes
- No
- I don't know

Please explain

18. Is your institution covered by a Continuity of Operations (COOP) Plan? COOP plans examine an institution's ability to perform minimum essential functions during any situation, and support the continuance of institution functions.

- Yes
- No
- I don't know

If "Yes", please explain.



Chester County Hazard Mitigation Plan Update - Academia Survey

19. Can you identify projects or programs that you have implemented to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

20. Can you identify projects or programs that you would like or plan to implement to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

21. Do you have any other comments, questions, or concerns?

22. Name of Respondent:

23. Contact information (email address or phone number) - optional:

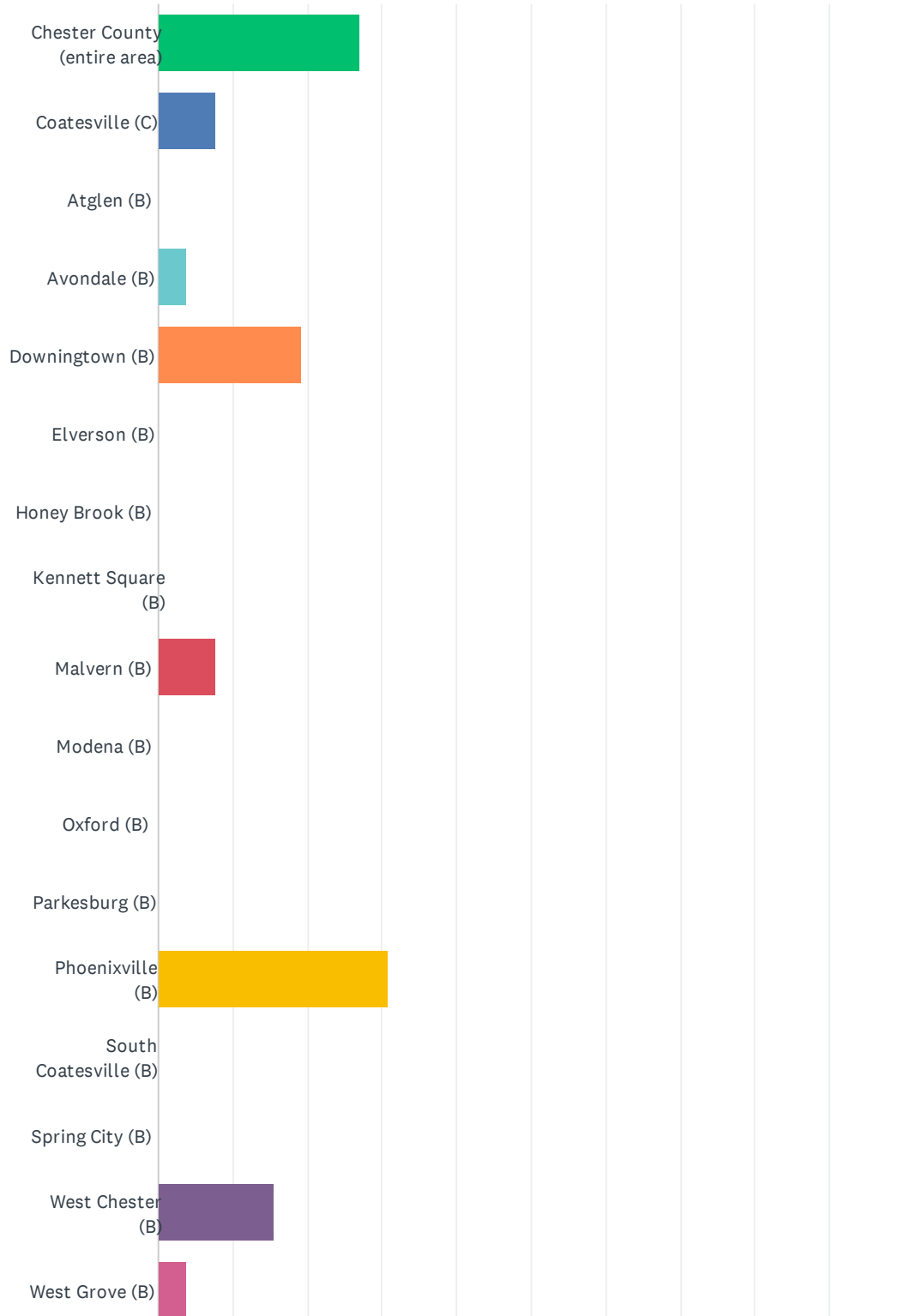
Q1 Name of your Academic Institution (school, district, higher education institution):

Answered: 25 Skipped: 1

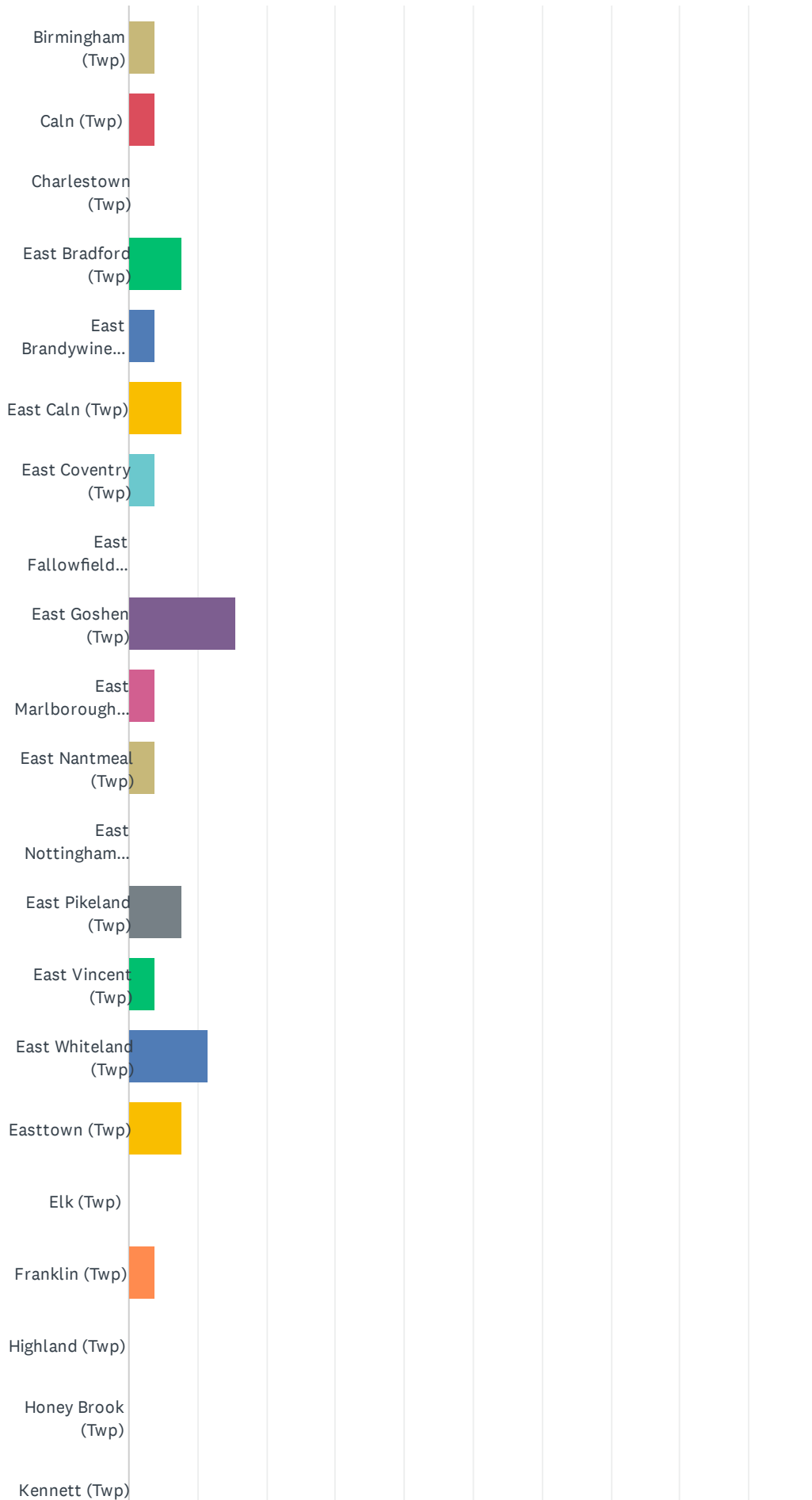
#	RESPONSES	DATE
1	Phoenixville Area School District	9/3/2020 1:04 PM
2	Phoenixville Area School District	8/27/2020 2:44 PM
3	Owen J. Roberts School District	8/26/2020 12:17 PM
4	Villa Maria Academy Lower School	8/26/2020 7:18 AM
5	Windsor Christian Academy	8/24/2020 11:06 PM
6	The Vanguard School	8/24/2020 1:15 PM
7	Good Samaritan Day School	8/24/2020 12:30 PM
8	Goshen Friends School	8/24/2020 10:25 AM
9	Unionville Chadds Ford School District	8/23/2020 6:30 PM
10	Delaware Valley Friends School	8/21/2020 2:51 PM
11	Delaware County Christian School	8/21/2020 12:56 PM
12	Collegium Charter School	8/21/2020 9:43 AM
13	Avon Grove School District	8/21/2020 9:10 AM
14	Holy Family School	8/21/2020 9:05 AM
15	Phoenixville Area Middle School	8/21/2020 7:51 AM
16	North Brandywine Middle School 7th Grade Center	8/21/2020 7:25 AM
17	Chester County Intermediate Unit	8/21/2020 5:09 AM
18	Chester County Intermediate Unit	8/20/2020 10:06 PM
19	West Chester Area School District	8/20/2020 9:08 PM
20	Phoenixville Area School District	8/20/2020 7:17 PM
21	The Concept School	8/20/2020 6:59 PM
22	Downingtown Area School District	8/20/2020 5:40 PM
23	Saint Patrick School	8/20/2020 5:33 PM
24	Chester County Head Start	8/20/2020 4:59 PM
25	Villa Maria Academy High School	8/20/2020 4:56 PM

Q2 Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is countywide:

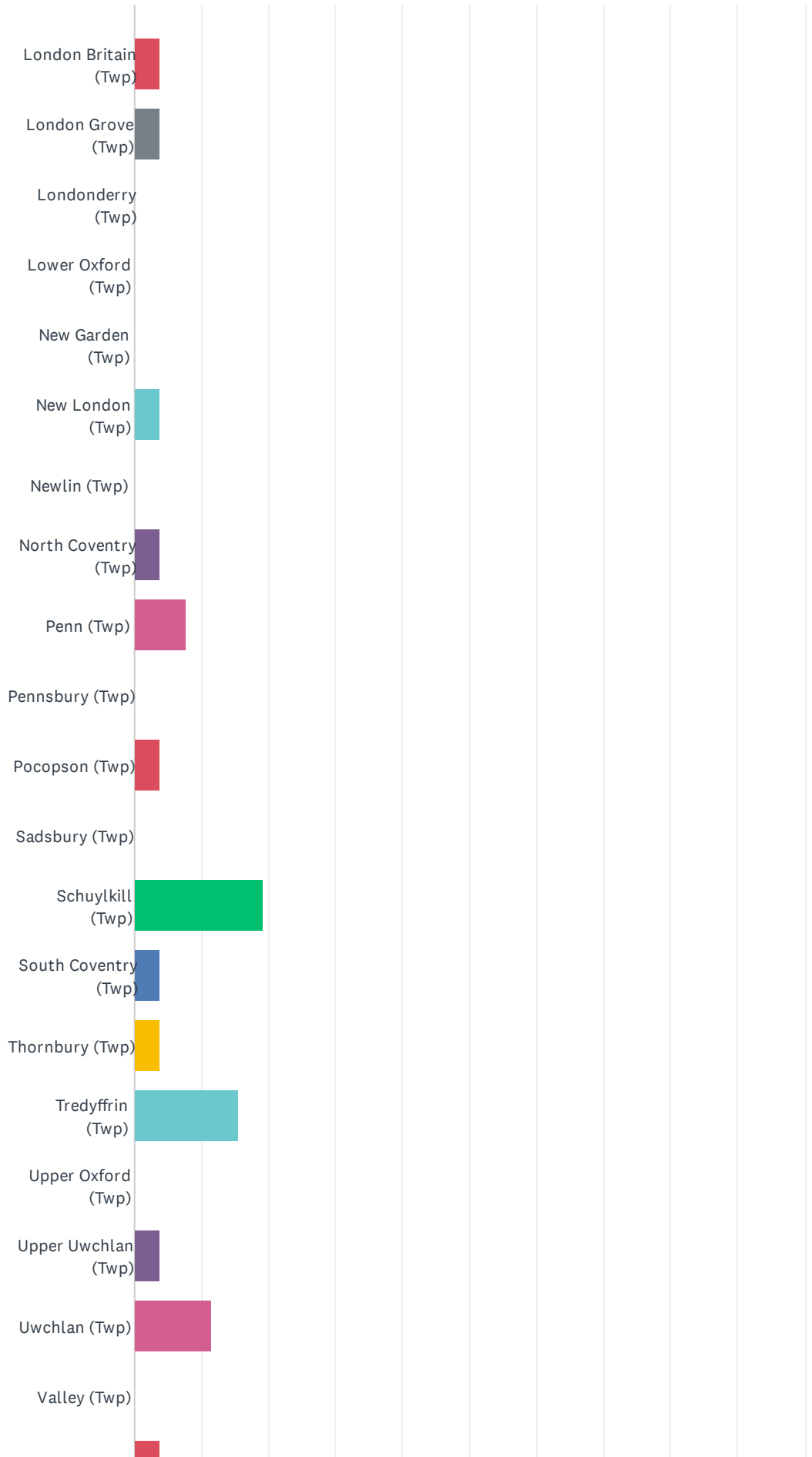
Answered: 26 Skipped: 0



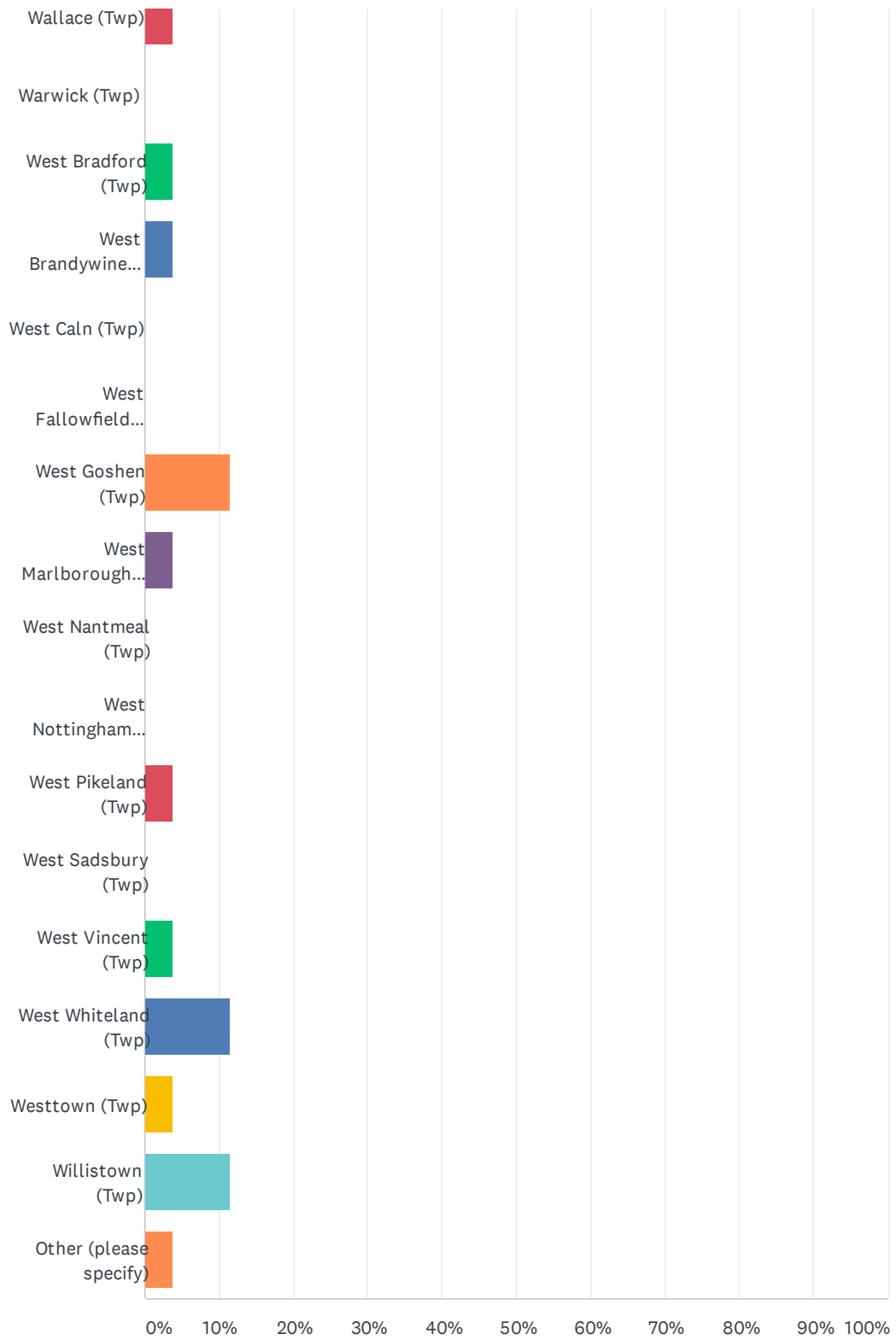
Chester County Hazard Mitigation Plan Update - Academia Survey



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ANSWER CHOICES	RESPONSES	
Chester County (entire area)	26.92%	7
Coatesville (C)	7.69%	2
Atglen (B)	0.00%	0
Avondale (B)	3.85%	1
Downingtown (B)	19.23%	5
Elverson (B)	0.00%	0
Honey Brook (B)	0.00%	0
Kennett Square (B)	0.00%	0
Malvern (B)	7.69%	2
Modena (B)	0.00%	0
Oxford (B)	0.00%	0
Parkesburg (B)	0.00%	0
Phoenixville (B)	30.77%	8
South Coatesville (B)	0.00%	0
Spring City (B)	0.00%	0
West Chester (B)	15.38%	4
West Grove (B)	3.85%	1
Birmingham (Twp)	3.85%	1
Caln (Twp)	3.85%	1
Charlestown (Twp)	0.00%	0
East Bradford (Twp)	7.69%	2
East Brandywine (Twp)	3.85%	1
East Caln (Twp)	7.69%	2
East Coventry (Twp)	3.85%	1
East Fallowfield (Twp)	0.00%	0
East Goshen (Twp)	15.38%	4
East Marlborough (Twp)	3.85%	1
East Nantmeal (Twp)	3.85%	1
East Nottingham (Twp)	0.00%	0
East Pikeland (Twp)	7.69%	2
East Vincent (Twp)	3.85%	1
East Whiteland (Twp)	11.54%	3

Chester County Hazard Mitigation Plan Update - Academia Survey

Easttown (Twp)	7.69%	2
Elk (Twp)	0.00%	0
Franklin (Twp)	3.85%	1
Highland (Twp)	0.00%	0
Honey Brook (Twp)	0.00%	0
Kennett (Twp)	0.00%	0
London Britain (Twp)	3.85%	1
London Grove (Twp)	3.85%	1
Londonderry (Twp)	0.00%	0
Lower Oxford (Twp)	0.00%	0
New Garden (Twp)	0.00%	0
New London (Twp)	3.85%	1
Newlin (Twp)	0.00%	0
North Coventry (Twp)	3.85%	1
Penn (Twp)	7.69%	2
Pennsbury (Twp)	0.00%	0
Pocopson (Twp)	3.85%	1
Sadsbury (Twp)	0.00%	0
Schuylkill (Twp)	19.23%	5
South Coventry (Twp)	3.85%	1
Thornbury (Twp)	3.85%	1
Tredyffrin (Twp)	15.38%	4
Upper Oxford (Twp)	0.00%	0
Upper Uwchlan (Twp)	3.85%	1
Uwchlan (Twp)	11.54%	3
Valley (Twp)	0.00%	0
Wallace (Twp)	3.85%	1
Warwick (Twp)	0.00%	0
West Bradford (Twp)	3.85%	1
West Brandywine (Twp)	3.85%	1
West Caln (Twp)	0.00%	0
West Fallowfield (Twp)	0.00%	0
West Goshen (Twp)	11.54%	3
West Marlborough (Twp)	3.85%	1

Chester County Hazard Mitigation Plan Update - Academia Survey

West Nantmeal (Twp)	0.00%	0
West Nottingham (Twp)	0.00%	0
West Pikeland (Twp)	3.85%	1
West Sadsbury (Twp)	0.00%	0
West Vincent (Twp)	3.85%	1
West Whiteland (Twp)	11.54%	3
Westtown (Twp)	3.85%	1
Willistown (Twp)	11.54%	3
Other (please specify)	3.85%	1
Total Respondents: 26		

#	OTHER (PLEASE SPECIFY)	DATE
1	Thornbury Twp. Delaware County	8/20/2020 9:08 PM

Q3 How many faculty members work at your academic institution?

Answered: 25 Skipped: 1

#	RESPONSES	DATE
1	325	9/3/2020 1:04 PM
2	Approx. 900	8/26/2020 12:17 PM
3	48	8/26/2020 7:18 AM
4	40	8/24/2020 11:06 PM
5	Approximately 200 school employees, total employees on campus is approximately 230.	8/24/2020 1:15 PM
6	typically 40, this year 25	8/24/2020 12:30 PM
7	10 teachers, 2 administrators, 2 volunteers	8/24/2020 10:25 AM
8	1000	8/23/2020 6:30 PM
9	about 35	8/21/2020 2:51 PM
10	approximately 100 faculty and staff	8/21/2020 12:56 PM
11	560	8/21/2020 9:43 AM
12	150	8/21/2020 9:26 AM
13	700	8/21/2020 9:10 AM
14	23	8/21/2020 9:05 AM
15	97	8/21/2020 7:51 AM
16	35	8/21/2020 7:25 AM
17	1200	8/21/2020 5:09 AM
18	1700+	8/20/2020 10:06 PM
19	1450	8/20/2020 9:08 PM
20	68	8/20/2020 7:17 PM
21	12	8/20/2020 6:59 PM
22	1000 across 16 schools	8/20/2020 5:40 PM
23	26	8/20/2020 5:33 PM
24	83	8/20/2020 4:59 PM
25	92	8/20/2020 4:56 PM

Q4 How many students attend your academic institution?

Answered: 25 Skipped: 1

#	RESPONSES	DATE
1	4100	9/3/2020 1:04 PM
2	Approx 5500	8/26/2020 12:17 PM
3	260	8/26/2020 7:18 AM
4	212	8/24/2020 11:06 PM
5	This number is not 'fixed'. Range of students attending is 240 - 270.	8/24/2020 1:15 PM
6	Typically 250, this year 100	8/24/2020 12:30 PM
7	33	8/24/2020 10:25 AM
8	4700	8/23/2020 6:30 PM
9	about 200	8/21/2020 2:51 PM
10	approximately 580	8/21/2020 12:56 PM
11	Around 3100	8/21/2020 9:43 AM
12	1100	8/21/2020 9:26 AM
13	5100	8/21/2020 9:10 AM
14	210	8/21/2020 9:05 AM
15	1000	8/21/2020 7:51 AM
16	405	8/21/2020 7:25 AM
17	4500	8/21/2020 5:09 AM
18	3500+	8/20/2020 10:06 PM
19	12,152	8/20/2020 9:08 PM
20	515	8/20/2020 7:17 PM
21	31	8/20/2020 6:59 PM
22	13,000 across 16 schools	8/20/2020 5:40 PM
23	330	8/20/2020 5:33 PM
24	600	8/20/2020 4:59 PM
25	391	8/20/2020 4:56 PM

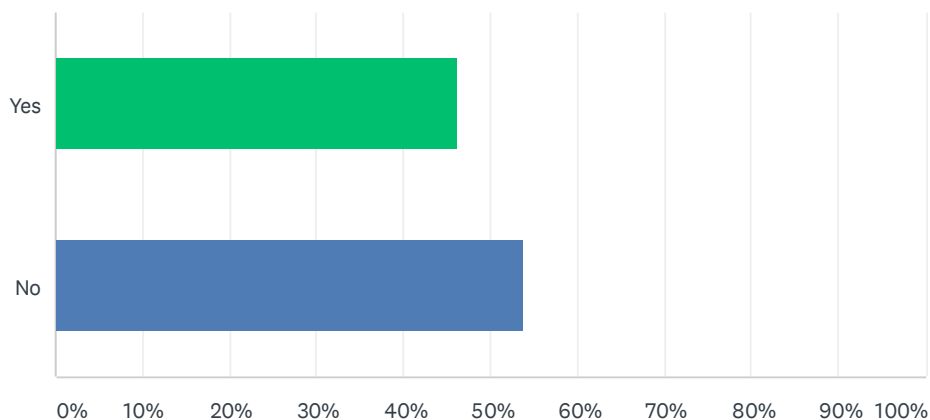
Q5 During the school year, how many students reside on campus?

Answered: 26 Skipped: 0

#	RESPONSES	DATE
1	0	9/3/2020 1:04 PM
2	0	8/27/2020 2:44 PM
3	None	8/26/2020 12:17 PM
4	0	8/26/2020 7:18 AM
5	0	8/24/2020 11:06 PM
6	No students reside on campus.	8/24/2020 1:15 PM
7	0	8/24/2020 12:30 PM
8	No one resides - we are a preschool	8/24/2020 10:25 AM
9	0	8/23/2020 6:30 PM
10	none	8/21/2020 2:51 PM
11	none	8/21/2020 12:56 PM
12	0	8/21/2020 9:43 AM
13	0	8/21/2020 9:26 AM
14	0	8/21/2020 9:10 AM
15	0	8/21/2020 9:05 AM
16	N/A	8/21/2020 7:51 AM
17	NA	8/21/2020 7:25 AM
18	0	8/21/2020 5:09 AM
19	0	8/20/2020 10:06 PM
20	0	8/20/2020 9:08 PM
21	0	8/20/2020 7:17 PM
22	0	8/20/2020 6:59 PM
23	0	8/20/2020 5:40 PM
24	0	8/20/2020 5:33 PM
25	0	8/20/2020 4:59 PM
26	0	8/20/2020 4:56 PM

Q6 Has your academic institution been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Answered: 26 Skipped: 0

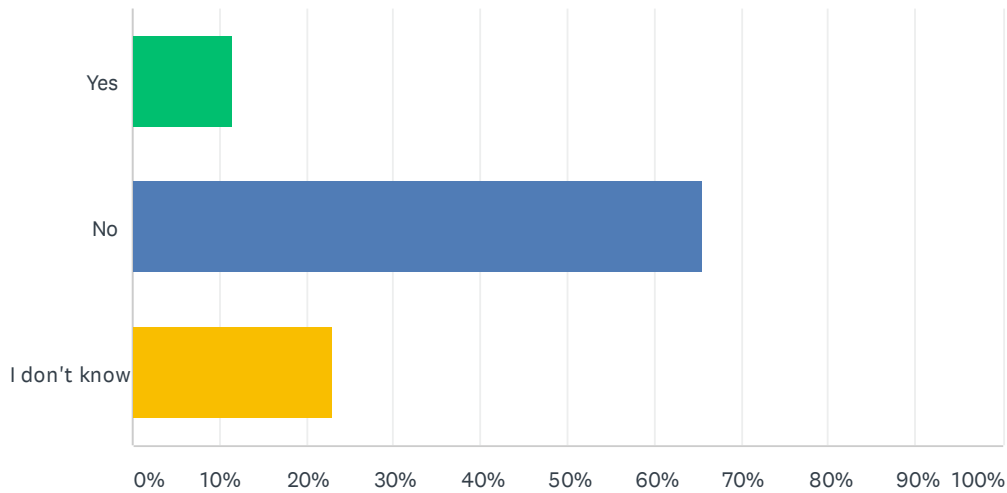


ANSWER CHOICES	RESPONSES
Yes	46.15% 12
No	53.85% 14
TOTAL	26

#	IF YOU ANSWERED "YES", PLEASE IDENTIFY THE EVENTS AND PROVIDE A BRIEF DESCRIPTION OF THE DAMAGES OR LOSS OF SERVICE	DATE
1	We have been closed several times for electrical outages due to severe thunderstorms and ice storms.	9/3/2020 1:04 PM
2	We have been closed several times due to electrical outages due to severe thunderstorms and ice storms.	8/27/2020 2:44 PM
3	Most recently the tropical storm caused loss of power for over 2.5 days. Typically the damage is minor, however, the business is interrupted due to loss of power.	8/24/2020 1:15 PM
4	Covid pandemic - March-July 2020	8/24/2020 10:25 AM
5	covid 19 flooding	8/23/2020 6:30 PM
6	COVID shutdown March 2020	8/21/2020 12:56 PM
7	Pandemic Covid-19	8/21/2020 7:25 AM
8	COVID-19 Loss of power	8/21/2020 5:09 AM
9	Power outages due to storms	8/20/2020 9:08 PM
10	COVID-19	8/20/2020 7:17 PM
11	COVID-19	8/20/2020 6:59 PM
12	COVID-19 shut down schools from March13 to June 5th	8/20/2020 5:40 PM

Q7 Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, sinkholes, etc.)?

Answered: 26 Skipped: 0

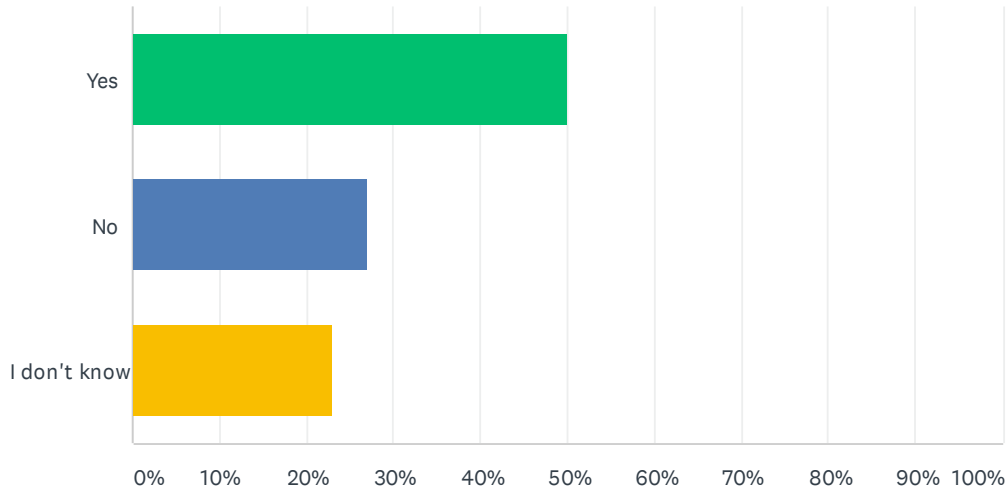


ANSWER CHOICES	RESPONSES
Yes	11.54% 3
No	65.38% 17
I don't know	23.08% 6
TOTAL	26

#	PLEASE EXPLAIN	DATE
1	Fields in a flood plain	8/21/2020 9:43 AM
2	Westtown Thornbury Elem School is located on a 100 year flood plain	8/20/2020 9:08 PM

Q8 Do you believe that your facilities and associated infrastructure are disaster-resistant, or capable of withstanding a natural disaster (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 26 Skipped: 0



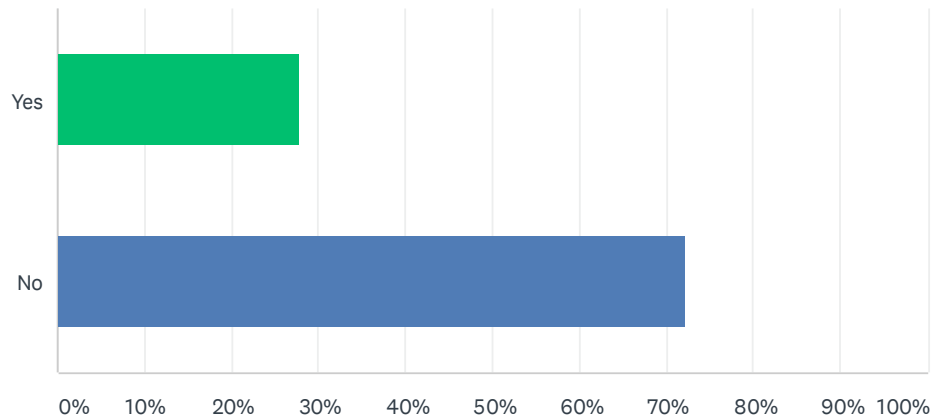
ANSWER CHOICES	RESPONSES	
Yes	50.00%	13
No	26.92%	7
I don't know	23.08%	6
TOTAL		26

Chester County Hazard Mitigation Plan Update - Academia Survey

#	PLEASE EXPLAIN	DATE
1	We have back up generators at all of our schools. We have used our buildings for emergency shelters in the past.	9/3/2020 1:04 PM
2	We have back up generators at all of our schools. We have used our buildings for emergency shelters in the past.	8/27/2020 2:44 PM
3	While any structure is susceptible to damage, the construction and size of our school buildings tend to make them more resistant. Our buildings also have limited generator capacity.	8/26/2020 12:17 PM
4	We are a self-contained campus on North Valley Road in Malvern, PA. We have limited resources, however, we typically have some battery back-up for a certain amount of time. Our buildings are older and therefore are more susceptible to wind damage and other natural disaster outcomes.	8/24/2020 1:15 PM
5	We do not have back-up power	8/24/2020 10:25 AM
6	I have no reason to believe that our facility is especially vulnerable, but this question is not within my area of professional expertise.	8/21/2020 2:51 PM
7	Only 1 has generator at this time	8/21/2020 9:43 AM
8	The physical structure is sound and is disaster-resistant. I am not sure about the infrastructure and facilities. In a natural disaster we will likely lose power with very limited back up that is used primarily for lighting and computer back up. We may also lose water, though we have disaster emergency kits on hand to support our students and staff for at least a day.	8/21/2020 9:26 AM
9	Yes main building is masonry structure, but additions to main building are modular structure, wood frame, shingle roof/not as stable as masonry in a tornado	8/21/2020 7:25 AM
10	We do not have back up power.	8/20/2020 5:33 PM

Q9 If your facility is an American Red Cross (ARC) designated shelter, do you believe they are adequately designed and equipped to support sheltering during and after hazard events? Do your facilities have generator capabilities to support the ARC shelter?

Answered: 18 Skipped: 8



ANSWER CHOICES	RESPONSES
Yes	27.78% 5
No	72.22% 13
TOTAL	18

#	PLEASE EXPLAIN	DATE
1	I believe we are an ARC shelter- They have used Barkley Elementary in the past.and the American Red Cross provided food and cots. We do have generator capabilities.	9/3/2020 1:04 PM
2	I do not know if any of our buildings are officially designated as ARC Shelters. I would believe they meet many of the requirements to be designated as such. Our buildings do have generator capability, but other than our Administration building, they are not full-service generators. They are designed to keep certain items functional, such as emergency lighting, radios, limited phones and computers.	8/26/2020 12:17 PM
3	Not an ARC designated shelter.	8/24/2020 1:15 PM
4	na	8/23/2020 6:30 PM
5	We are not an ARC designed shelter.	8/21/2020 9:26 AM
6	Not sure about Red Cross shelter. We are a POD site.	8/21/2020 7:51 AM
7	All facilities have generator power.	8/21/2020 5:09 AM
8	Three high schools and three middle schools have large cafeteria, auditoriums, gyms and locker rooms with showers	8/20/2020 9:08 PM
9	Some of the schools are	8/20/2020 5:40 PM

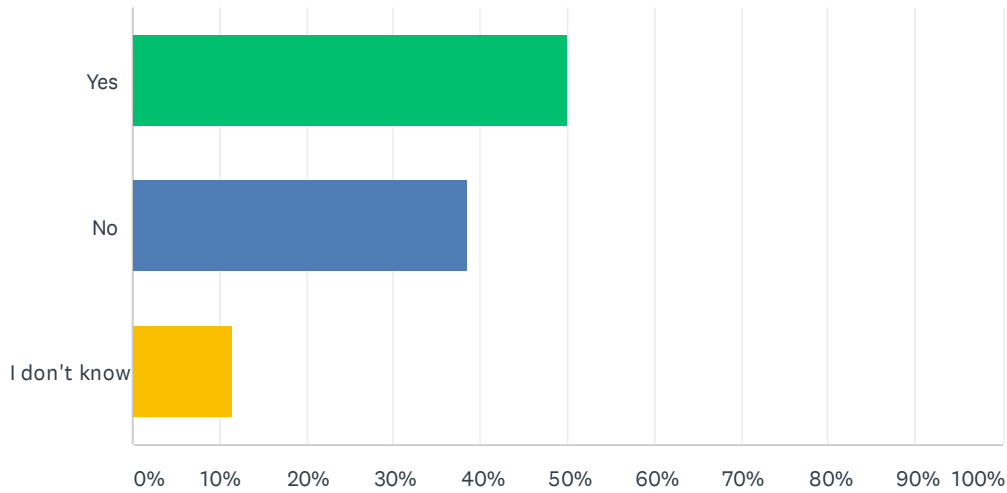
Q10 If you answered yes to the question above, what is the capacity of the shelter?

Answered: 8 Skipped: 18

#	RESPONSES	DATE
1	Not sure	9/3/2020 1:04 PM
2	The High School has two gym areas, while all other schools have a single gym area.	8/26/2020 12:17 PM
3	N/A	8/24/2020 1:15 PM
4	Shelter in Place and POD	8/21/2020 9:10 AM
5	We are not large enough.	8/21/2020 5:09 AM
6	We have 30 locations so it depends.	8/20/2020 10:06 PM
7	6 sites could handle 1200 people	8/20/2020 9:08 PM
8	Do not know	8/20/2020 5:40 PM

Q11 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards?

Answered: 26 Skipped: 0



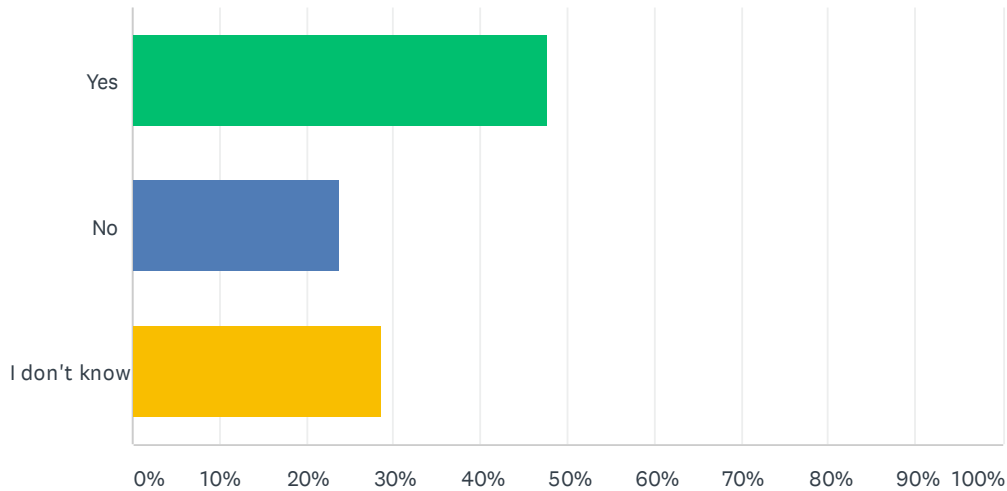
ANSWER CHOICES	RESPONSES	
Yes	50.00%	13
No	38.46%	10
I don't know	11.54%	3
TOTAL		26

Chester County Hazard Mitigation Plan Update - Academia Survey

#	PLEASE EXPLAIN	DATE
1	Our transportation infrastructure on school property is properly designed. I cannot speak for the borough or surrounding townships.	9/3/2020 1:04 PM
2	Our transportation on school property are properly designed. I cannot speak for the borough and surrounding townships.	8/27/2020 2:44 PM
3	It depends on the location. The French Creek Elementary School (East Nantmeal) is located south of a bridge that floods out during all major storms. This school is often cut off. Most other schools are located in areas that see limited roadway blockages.	8/26/2020 12:17 PM
4	We are located on a narrow, two lane road. Large, mature trees line the road. Other roads staff take to get to work, like Yellow Springs is also lined with trees and often floods during extremely heavy rains.	8/24/2020 1:15 PM
5	Our road is frequently congested as a result of the intersections where North Valley Rd crosses Lancaster Ave, East Central Ave, and West Central Ave. We are hopeful that planned changes to the routing of North Valley Rd will happen soon. There are significant issues with both congestion and safety, especially due to a "blind hill" that goes over the SEPTA/Amtrak line.	8/21/2020 2:51 PM
6	During severe storms the roads are flooded with limited or no access outside a short radius from campus.	8/21/2020 9:26 AM
7	Bridges in Downingtown are damaged.	8/20/2020 10:06 PM
8	Roads flood and are closed	8/20/2020 7:17 PM
9	Route 926 often floods	8/20/2020 6:59 PM
10	School district is a large area. Some roads flood more easily than others.	8/20/2020 5:40 PM
11	The roads are small - bridge into Malvern is questionable	8/20/2020 5:33 PM
12	Roads are tight around campus. If the road is blocked, it is very difficult to get in or out of campus.	8/20/2020 4:56 PM

Q12 Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support your academic functions during and after hazard events?

Answered: 21 Skipped: 5



ANSWER CHOICES	RESPONSES
Yes	47.62% 10
No	23.81% 5
I don't know	28.57% 6
TOTAL	21

#	PLEASE EXPLAIN	DATE
1	We have the utility infrastructure to support academic functions. I cannot speak for the companies that supply our utilities.	9/3/2020 1:09 PM
2	We have the utility infrastructure to support academic functions. I cannot speak of the companies that supply our utilities.	8/27/2020 2:56 PM
3	The high school and middle school (South Coventry) lose power easier during regular summer storms. It's likely they would suffer power loss during any significant event.	8/26/2020 12:30 PM
4	I'm not sure. We have limited back up battery. We have on generator tied to the cafeteria to ensure food stays safe and it is a larger space in the event it needed to be used as a temporary re-location site. However, the space is limited to approximately 220 individuals. With both staff and kids, the total number of people on campus exceeds 450 people.	8/24/2020 1:24 PM
5	We tend to loose power easily here.	8/21/2020 9:47 AM
6	No. We do not have adequate electrical back up to power communications or pumps for the sewer.	8/21/2020 9:40 AM
7	Back up generators, radio access, public water & sewer	8/21/2020 7:34 AM
8	Everything is underground so as long as that is not disturbed we should be good.	8/20/2020 4:58 PM

Q13 Looking at the facilities you own/operate, are there facilities that DO NOT have backup power generation capabilities? If yes, please identify those facilities.

Answered: 13 Skipped: 13

#	RESPONSES	DATE
1	no	9/3/2020 1:09 PM
2	All facilities have generator power.	8/26/2020 12:30 PM
3	We are located on the campus of Villa Maria House of Studies which supplies our power. Currently, the campus is supplied by two lines of power.	8/26/2020 7:20 AM
4	Yes, only one building has a generator, the Cafeteria. No other building on campus has a generator. There are approximately 20 buildings, some small/some large, but again, only one has a generator.	8/24/2020 1:24 PM
5	We do not have a generator on our campus	8/24/2020 10:26 AM
6	I dont know	8/23/2020 6:32 PM
7	Our 500, 515, 160, 468, and 486 buildings do not	8/21/2020 9:47 AM
8	Yes. The school buildings.	8/21/2020 9:07 AM
9	All have backup generators	8/20/2020 9:09 PM
10	All	8/20/2020 7:00 PM
11	Facilities have back up generators to perform some functions	8/20/2020 5:41 PM
12	None of our facilities have back up power.	8/20/2020 5:35 PM
13	Yes, St Joseph hall	8/20/2020 4:58 PM

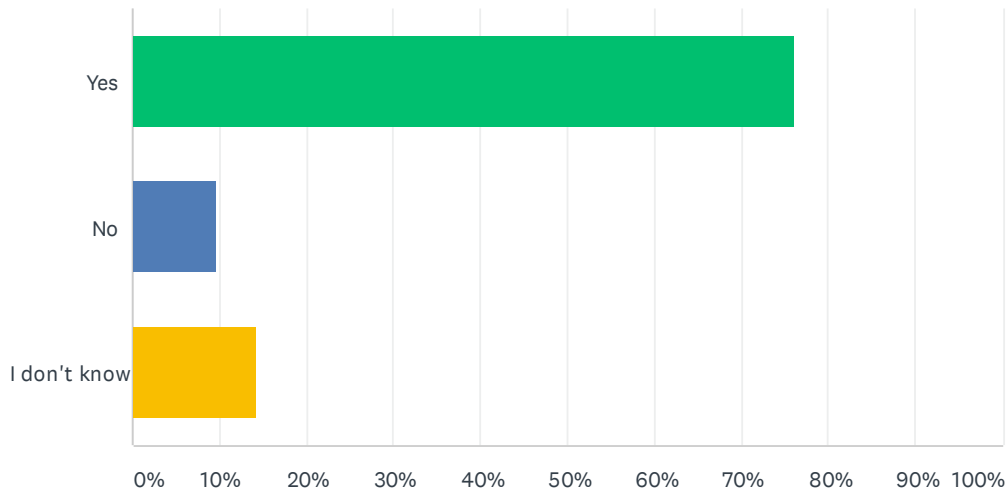
Q14 What mass notification/texting system does your institution use to send information to students and parents, if any?

Answered: 20 Skipped: 6

#	RESPONSES	DATE
1	Skyalert	9/3/2020 1:09 PM
2	Skylert, which can be used to send email notices or phone calls to anyone registered in the system.	8/26/2020 12:30 PM
3	We notify parents through FACTS.	8/26/2020 7:20 AM
4	We employ Connect 5/Blackbaud for texting, emailing to families and staff.	8/24/2020 1:24 PM
5	email entire parent body through Smart Tuition.	8/24/2020 12:32 PM
6	Email, website, social media	8/24/2020 10:26 AM
7	swift k12	8/23/2020 6:32 PM
8	Swift K-12 and others	8/21/2020 2:53 PM
9	School messengerw	8/21/2020 9:47 AM
10	Skyward's Skylert will send out text messages, voice messages (via phone) and emails.	8/21/2020 9:40 AM
11	School Messenger	8/21/2020 9:10 AM
12	Option C	8/21/2020 9:07 AM
13	Messenger	8/21/2020 7:34 AM
14	School Messenger	8/21/2020 5:11 AM
15	SchoolMessenger Alert system	8/20/2020 9:09 PM
16	Constant Contact	8/20/2020 7:00 PM
17	Black board	8/20/2020 5:41 PM
18	My Students Progress	8/20/2020 5:35 PM
19	MyHeadStart/Twilio	8/20/2020 4:59 PM
20	Schoolmessenger	8/20/2020 4:58 PM

Q15 Do you think that weather forecasts and announcements of road closures and pending road closures are sufficiently accurate and available to support your institution's operation and student transportation decisions in the event of hazard events?

Answered: 21 Skipped: 5

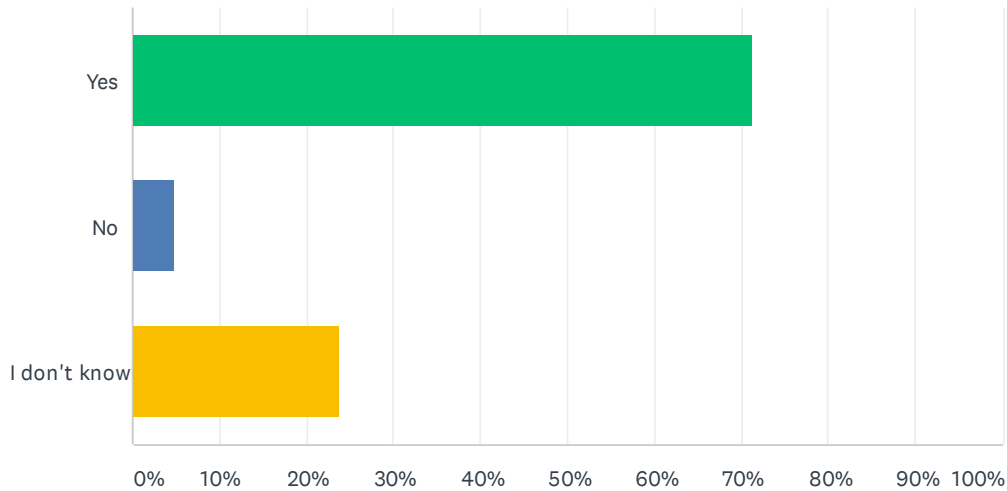


ANSWER CHOICES	RESPONSES
Yes	76.19% 16
No	9.52% 2
I don't know	14.29% 3
TOTAL	21

#	PLEASE EXPLAIN	DATE
1	We monitor several websites regarding forecasts and road closures. We also have people on the ground who perform road checks in times of severe weather events.	9/3/2020 1:09 PM
2	We monitor several websites regarding forecasts and road closures. We also have people on the ground who perform road checks in times of severe weather events.	8/27/2020 2:56 PM
3	Weather forecasts could be much better. We are a school of all special needs students. Having these kids in buses or waiting for parents to pick them up for up to 2 or 3 hours is a legitimate traumatic event for some of our kids. Road Closures are also a bit delayed. If there was a more mass notification process for roads to avoid that would help all transportation needs.	8/24/2020 1:24 PM
4	Yes, however, there is not a clear system of communication of which I am aware to learn about road closures. While weather forecasts have become ubiquitous enough that we can turn to any outlet for that, road closures are more limited.	8/21/2020 9:40 AM

Q16 Do you believe that emergency response planning, services, and equipment are capable of managing and responding properly to disasters in your community?

Answered: 21 Skipped: 5

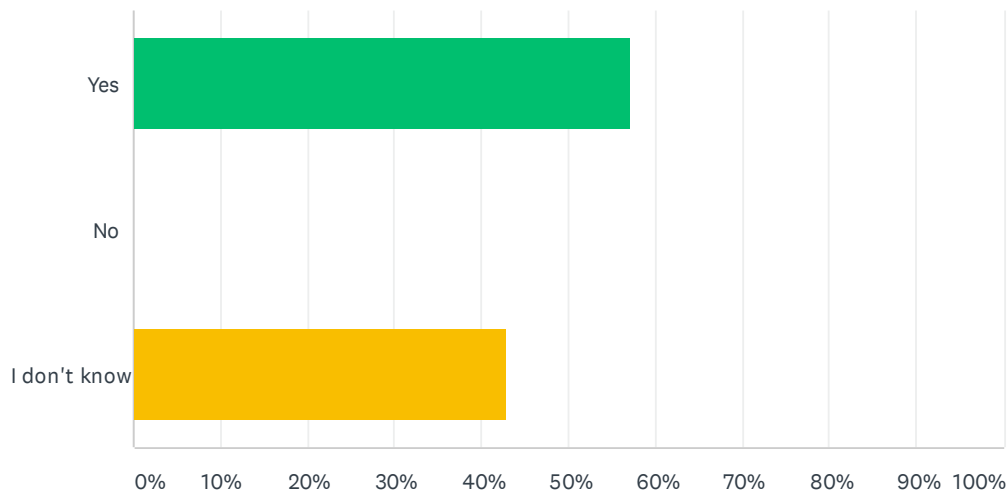


ANSWER CHOICES	RESPONSES
Yes	71.43% 15
No	4.76% 1
I don't know	23.81% 5
TOTAL	21

#	PLEASE EXPLAIN	DATE
1	Yes, we work with the Phoenixville Emergency Management Office during times of crisis.	9/3/2020 1:09 PM
2	We in the past and now have been working with the Phoenixville Emergency Management Office .	8/27/2020 2:56 PM

Q17 Do you believe that local government understands, supports, and possesses adequate resources for hazard risk reduction efforts in the community?

Answered: 21 Skipped: 5

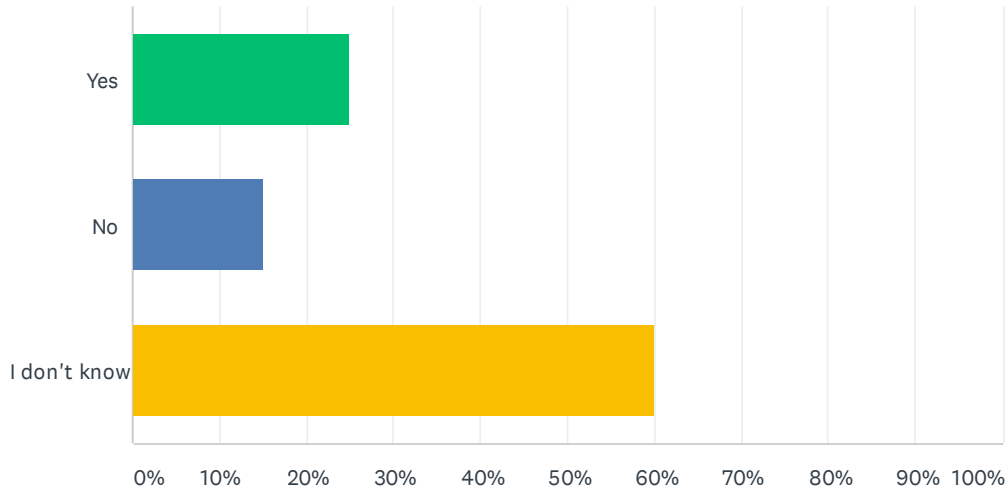


ANSWER CHOICES	RESPONSES
Yes	57.14% 12
No	0.00% 0
I don't know	42.86% 9
TOTAL	21

#	PLEASE EXPLAIN	DATE
1	We have worked together during crises in the past several years.	9/3/2020 1:09 PM
2	We have worked together during crises in the past several years.	8/27/2020 2:56 PM
3	We are not sure. Where are the resources listed to address a 'hazard risk' and reduce its' impact on the community? We have no idea as the local government is not something our nonprofit follows on a daily basis. Maybe more attention should be given to where local residents can find and review just how prepared the community is for a hazard risk.	8/24/2020 1:24 PM
4	I am aware of some work that gets done, but I don't know the scope of what needs to get done and how that compares.	8/21/2020 9:40 AM

Q18 Is your institution covered by a Continuity of Operations (COOP) Plan? COOP plans examine an institution’s ability to perform minimum essential functions during any situation, and support the continuance of institution functions.

Answered: 20 Skipped: 6



ANSWER CHOICES	RESPONSES
Yes	25.00% 5
No	15.00% 3
I don't know	60.00% 12
TOTAL	20

#	IF "YES", PLEASE EXPLAIN.	DATE
1	In any emergency situation, our normal functions would cease and staff and students would be evacuated at the first opportunity.	8/26/2020 12:30 PM
2	We have a Business Continuity plan that allows for essential functions to continue. We have the 'plan' on an encrypted thumb drive and is distributed to the ED, CFO and Director of Technology.	8/24/2020 1:24 PM
3	COVID has helped every school with this if they didn't already have a plan	8/21/2020 9:47 AM
4	Act 13 of 2020 requires school districts to provide notice of plans to provide a free and appropriate public education	8/21/2020 7:34 AM
5	We have phones and wireless network on backup generators	8/20/2020 9:09 PM
6	We are able to provide a virtual school due to loss or closure for a time as our many services are in the cloud.	8/20/2020 4:58 PM

Q19 Can you identify projects or programs that you have implemented to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 10 Skipped: 16

#	RESPONSES	DATE
1	We have implemented new practices during the COVID crisis.	9/3/2020 1:10 PM
2	N/A	8/26/2020 12:31 PM
3	no	8/26/2020 7:21 AM
4	Over the last several months, every employee has had to work from home. The nonprofit organization is supported by technology whether it is communication or actual online activity.	8/24/2020 1:27 PM
5	Fire, wind and intruder drills	8/24/2020 12:33 PM
6	no	8/23/2020 6:32 PM
7	We added battery back up for our servers and a generator for some cafeteria equipment and emergency lighting.	8/21/2020 10:00 AM
8	None	8/21/2020 7:35 AM
9	We installed repeaters in schools for better communication systems	8/20/2020 9:10 PM
10	None	8/20/2020 5:36 PM

Q20 Can you identify projects or programs that you would like or plan to implement to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 9 Skipped: 17

#	RESPONSES	DATE
1	Not at this time	9/3/2020 1:10 PM
2	N/A	8/26/2020 12:31 PM
3	NO	8/26/2020 7:21 AM
4	More generators across the campus (cost is an issue) would be ideal.	8/24/2020 1:27 PM
5	I dont know	8/23/2020 6:32 PM
6	No.	8/21/2020 10:00 AM
7	NA	8/21/2020 7:35 AM
8	NO	8/20/2020 9:10 PM
9	Back up power capability	8/20/2020 5:36 PM

Q21 Do you have any other comments, questions, or concerns?

Answered: 3 Skipped: 23

#	RESPONSES	DATE
1	no	9/3/2020 1:10 PM
2	none	8/24/2020 1:27 PM
3	None	8/21/2020 7:35 AM

Q22 Name of Respondent:

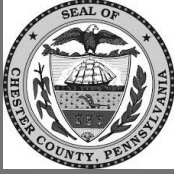
Answered: 19 Skipped: 7

#	RESPONSES	DATE
1	Phil Vontor	9/3/2020 1:10 PM
2	Phil Vontor	8/27/2020 2:55 PM
3	Brandon Daniels	8/26/2020 12:31 PM
4	Sister Susan Joseph, IHM, Ed.D.	8/26/2020 7:21 AM
5	Grace Fornicola	8/24/2020 1:27 PM
6	Barbara Condit, Director	8/24/2020 12:33 PM
7	Mimi Ackers, Head of School	8/24/2020 10:26 AM
8	Tricia Harlan	8/23/2020 6:32 PM
9	Kirk Smothers, Head of School	8/21/2020 2:53 PM
10	David Cosme Jr.	8/21/2020 10:00 AM
11	Bill Duffy	8/21/2020 9:47 AM
12	M Christopher Marchese, Ed.D.	8/21/2020 9:11 AM
13	Jennifer D'Amelio	8/21/2020 9:07 AM
14	NA	8/21/2020 7:35 AM
15	Paul K. Thompson, Jr.	8/21/2020 5:12 AM
16	Jim Scanlon	8/20/2020 9:10 PM
17	William Bennett	8/20/2020 7:01 PM
18	Robert Reed	8/20/2020 5:42 PM
19	Patricia O'Donnell	8/20/2020 5:36 PM

Q23 Contact information (email address or phone number) - optional:

Answered: 15 Skipped: 11

#	RESPONSES	DATE
1	vontorp@pasd.com	9/3/2020 1:10 PM
2	vontorp@pasd.com	8/27/2020 2:55 PM
3	bdaniels@ojrsd.net	8/26/2020 12:31 PM
4	610.644.4864	8/26/2020 7:21 AM
5	grfornicola@vfes.net	8/24/2020 1:27 PM
6	barb.condit@good-samaritan.org	8/24/2020 12:33 PM
7	mimi.ackers@goshenfriends.org	8/24/2020 10:26 AM
8	kirk.smothers@dvfs.org	8/21/2020 2:53 PM
9	david.cosme@rak12.org	8/21/2020 10:00 AM
10	Bduffy@ccs.us	8/21/2020 9:47 AM
11	jdamelio@myholyschool.org	8/21/2020 9:07 AM
12	pault@cciu.org	8/21/2020 5:12 AM
13	jscanlon@wcasd.net	8/20/2020 9:10 PM
14	rreed@dasd.org	8/20/2020 5:42 PM
15	podonnell@saintpatrickmalvern.org	8/20/2020 5:36 PM



Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a “blueprint” by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

Please answer the following questions about hazards and how they affect businesses in Chester County. Please provide as much information as possible. Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of Business

2. Type of Business

3. Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
| <input type="checkbox"/> Elverson (B) | <input type="checkbox"/> East Vincent (Twp) | <input type="checkbox"/> Upper Uwchlan (Twp) |
| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
| <input type="checkbox"/> Kennett Square (B) | <input type="checkbox"/> Easttown (Twp) | <input type="checkbox"/> Valley (Twp) |
| <input type="checkbox"/> Malvern (B) | <input type="checkbox"/> Elk (Twp) | <input type="checkbox"/> Wallace (Twp) |
| <input type="checkbox"/> Modena (B) | <input type="checkbox"/> Franklin (Twp) | <input type="checkbox"/> Warwick (Twp) |
| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
| <input type="checkbox"/> Parkesburg (B) | <input type="checkbox"/> Honey Brook (Twp) | <input type="checkbox"/> West Brandywine (Twp) |
| <input type="checkbox"/> Phoenixville (B) | <input type="checkbox"/> Kennett (Twp) | <input type="checkbox"/> West Caln (Twp) |
| <input type="checkbox"/> South Coatesville (B) | <input type="checkbox"/> London Britain (Twp) | <input type="checkbox"/> West Fallowfield (Twp) |
| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
| <input type="checkbox"/> Caln (Twp) | <input type="checkbox"/> New London (Twp) | <input type="checkbox"/> West Pikeland (Twp) |
| <input type="checkbox"/> Charlestown (Twp) | <input type="checkbox"/> Newlin (Twp) | <input type="checkbox"/> West Sadsbury (Twp) |
| <input type="checkbox"/> East Bradford (Twp) | <input type="checkbox"/> North Coventry (Twp) | <input type="checkbox"/> West Vincent (Twp) |
| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
| <input type="checkbox"/> East Caln (Twp) | <input type="checkbox"/> Pennsbury (Twp) | <input type="checkbox"/> Westtown (Twp) |
| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

4. Has your business been impacted by hazard events (damaged, closed for extended periods, etc.)?

Yes

No

If yes, please explain.



Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

5. Do you believe that your facilities are disaster resistant or capable of withstanding a disaster (e.g. are properly located and constructed and have back-up power as appropriate)?

Yes

Don't Know

No

Please explain

6. Do you think that the transportation infrastructure (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards, and thus provides long term support for your community's response and recovery needs?

Yes

Don't Know

No

Please explain

7. Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster resistant to support your department's ability to maintain operations and support response or recovery efforts?

Yes

Don't Know

No

Please explain

8. Do you believe that hazard risks (e.g. flood zones, steep slopes, wildfire risk zones) are considered when local authorities consider land development and land use planning?

Yes

Don't Know

No

Please explain

9. Do you believe that business organizations/associations, chambers of commerce, etc., are a valuable resource in helping business owners protect themselves pre-disaster, and/or help in recovery post disaster?

Yes

Don't Know

No

Please explain

10. Do you believe that businesses are aware and take appropriate advantage of flood insurance and other risk management resources and programs to help protect them from losses, as well as to support recovery from disasters?

Yes

Don't Know

No

Please explain

11. Do you believe that emergency planning, services, and equipment are adequate to manage and respond properly to disasters that may impact your business or commercial interests?

Yes

Don't Know

No

Please explain

12. Do you think the local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

Yes

Don't Know

No

Please explain

13. Is your business included within and/or maintain a Business Continuity Plan? This type of plan examines your business's ability to perform minimum essential functions during any situation.

Yes

Don't Know

No

Please explain



Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

14. Can you identify projects or programs that you have implemented to reduce your business's vulnerability to damages and losses, including loss of operation/service, to hazard events?

15. Can you identify projects or programs that you would like or plan to implement to reduce your business's vulnerability to damages and losses, including loss of operation/service, to hazard events?

16. Do you have any other comments, questions, or concerns?

17. Name of Respondent

18. Contact information (email address or phone number) optional

Q1 Name of Business

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	Atlantic Pension Services, Inc.	9/2/2020 2:36 PM

Q2 Type of Business

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	Consulting	9/2/2020 2:36 PM

Q3 Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

Answered: 1 Skipped: 0



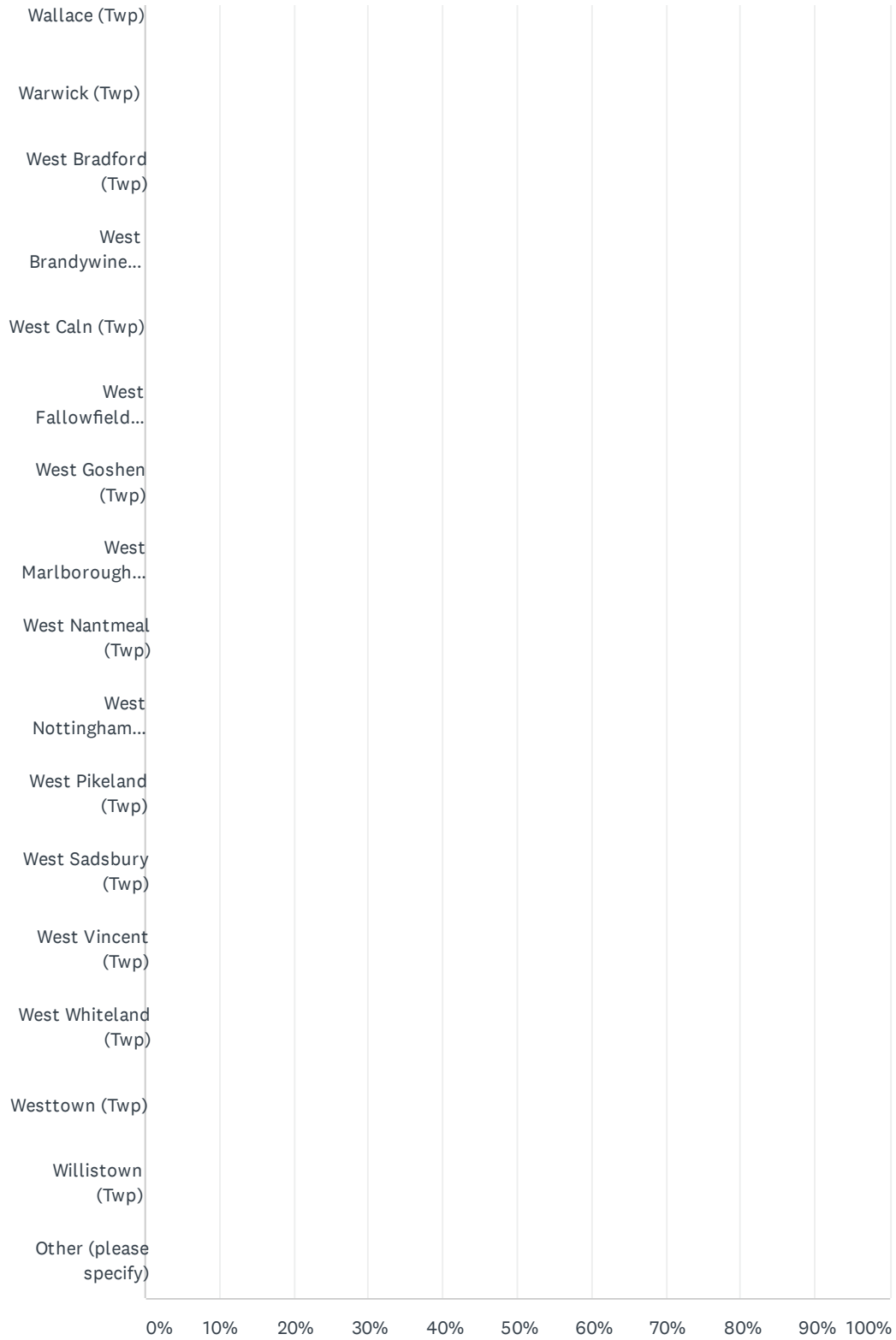
Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

Birmingham (Twp)									
Caln (Twp)									
Charlestown (Twp)									
East Bradford (Twp)									
East Brandywine...									
East Caln (Twp)									
East Coventry (Twp)									
East Fallowfield...									
East Goshen (Twp)									
East Marlborough...									
East Nantmeal (Twp)									
East Nottingham...									
East Pikeland (Twp)									
East Vincent (Twp)									
East Whiteland (Twp)									
Easttown (Twp)									
Elk (Twp)									
Franklin (Twp)									
Highland (Twp)									
Honey Brook (Twp)									
Kennett (Twp)									

Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

London Britain (Twp)										
London Grove (Twp)										
Londonderry (Twp)										
Lower Oxford (Twp)										
New Garden (Twp)										
New London (Twp)										
Newlin (Twp)										
North Coventry (Twp)										
Penn (Twp)										
Pennsbury (Twp)										
Pocopson (Twp)										
Sadsbury (Twp)										
Schuylkill (Twp)										
South Coventry (Twp)										
Thornbury (Twp)										
Tredyffrin (Twp)										
Upper Oxford (Twp)										
Upper Uwchlan (Twp)										
Uwchlan (Twp)										
Valley (Twp)										

Chester County Hazard Mitigation Plan Update - Business and Commerce Survey



Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

ANSWER CHOICES	RESPONSES	
Chester County (entire area)	100.00%	1
Coatesville (C)	0.00%	0
Atglen (B)	0.00%	0
Avondale (B)	0.00%	0
Downingtown (B)	0.00%	0
Elverson (B)	0.00%	0
Honey Brook (B)	0.00%	0
Kennett Square (B)	0.00%	0
Malvern (B)	0.00%	0
Modena (B)	0.00%	0
Oxford (B)	0.00%	0
Parkesburg (B)	0.00%	0
Phoenixville (B)	0.00%	0
South Coatesville (B)	0.00%	0
Spring City (B)	0.00%	0
West Chester (B)	0.00%	0
West Grove (B)	0.00%	0
Birmingham (Twp)	0.00%	0
Caln (Twp)	0.00%	0
Charlestown (Twp)	0.00%	0
East Bradford (Twp)	0.00%	0
East Brandywine (Twp)	0.00%	0
East Caln (Twp)	0.00%	0
East Coventry (Twp)	0.00%	0
East Fallowfield (Twp)	0.00%	0
East Goshen (Twp)	0.00%	0
East Marlborough (Twp)	0.00%	0
East Nantmeal (Twp)	0.00%	0
East Nottingham (Twp)	0.00%	0
East Pikeland (Twp)	0.00%	0
East Vincent (Twp)	0.00%	0
East Whiteland (Twp)	0.00%	0

Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

Easttown (Twp)	0.00%	0
Elk (Twp)	0.00%	0
Franklin (Twp)	0.00%	0
Highland (Twp)	0.00%	0
Honey Brook (Twp)	0.00%	0
Kennett (Twp)	0.00%	0
London Britain (Twp)	0.00%	0
London Grove (Twp)	0.00%	0
Londonderry (Twp)	0.00%	0
Lower Oxford (Twp)	0.00%	0
New Garden (Twp)	0.00%	0
New London (Twp)	0.00%	0
Newlin (Twp)	0.00%	0
North Coventry (Twp)	0.00%	0
Penn (Twp)	0.00%	0
Pennsbury (Twp)	0.00%	0
Pocopson (Twp)	0.00%	0
Sadsbury (Twp)	0.00%	0
Schuylkill (Twp)	0.00%	0
South Coventry (Twp)	0.00%	0
Thornbury (Twp)	0.00%	0
Tredyffrin (Twp)	0.00%	0
Upper Oxford (Twp)	0.00%	0
Upper Uwchlan (Twp)	0.00%	0
Uwchlan (Twp)	0.00%	0
Valley (Twp)	0.00%	0
Wallace (Twp)	0.00%	0
Warwick (Twp)	0.00%	0
West Bradford (Twp)	0.00%	0
West Brandywine (Twp)	0.00%	0
West Caln (Twp)	0.00%	0
West Fallowfield (Twp)	0.00%	0
West Goshen (Twp)	0.00%	0
West Marlborough (Twp)	0.00%	0

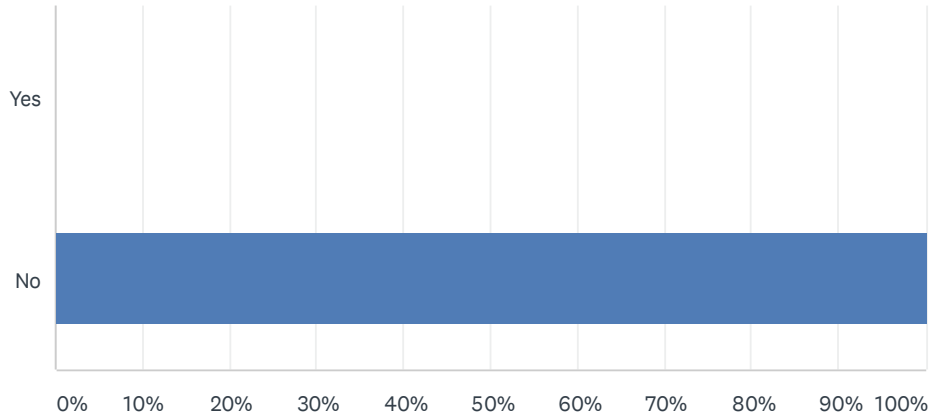
Chester County Hazard Mitigation Plan Update - Business and Commerce Survey

West Nantmeal (Twp)	0.00%	0
West Nottingham (Twp)	0.00%	0
West Pikeland (Twp)	0.00%	0
West Sadsbury (Twp)	0.00%	0
West Vincent (Twp)	0.00%	0
West Whiteland (Twp)	0.00%	0
Westtown (Twp)	0.00%	0
Willistown (Twp)	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 1		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q4 Has your business been impacted by hazard events (damaged, closed for extended periods, etc.)?

Answered: 1 Skipped: 0

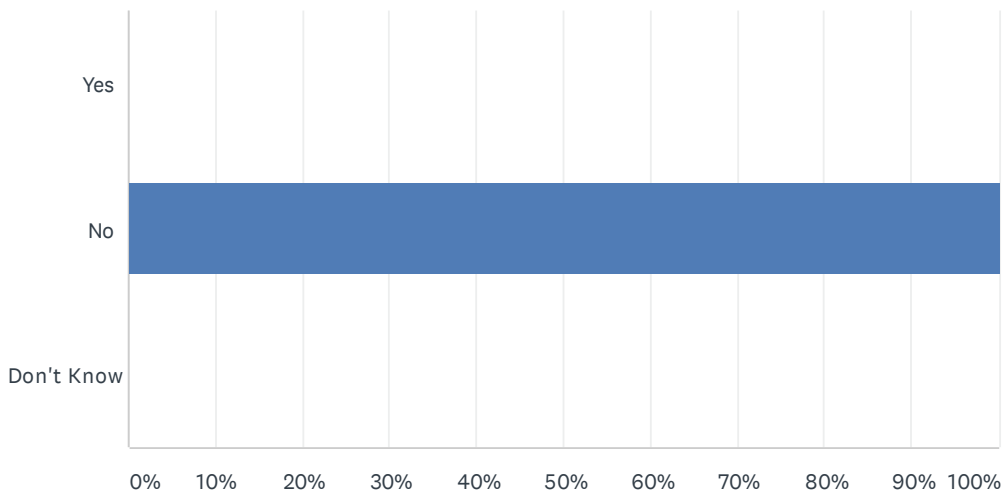


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	100.00% 1
TOTAL	1

#	IF YES, PLEASE EXPLAIN.	DATE
	There are no responses.	

Q5 Do you believe that your facilities are disaster resistant or capable of withstanding a disaster (e.g. are properly located and constructed and have back-up power as appropriate)?

Answered: 1 Skipped: 0

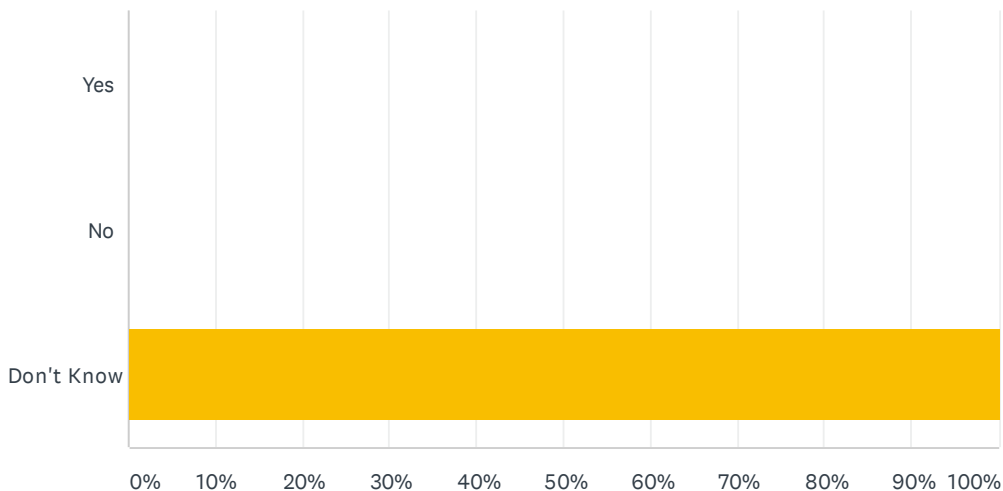


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	100.00% 1
Don't Know	0.00% 0
TOTAL	1

#	PLEASE EXPLAIN	DATE
1	We do not have backup power and we rely on the Internet so lack of power or internet would be hard. Our server is at work so both are needed even when working from home.	9/2/2020 2:41 PM

Q6 Do you think that the transportation infrastructure (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards, and thus provides long term support for your community's response and recovery needs?

Answered: 1 Skipped: 0

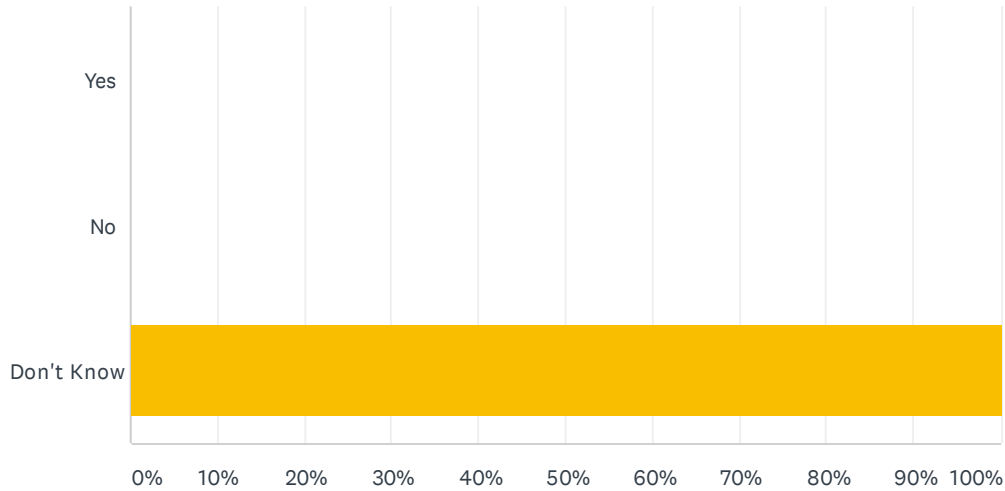


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	0.00% 0
Don't Know	100.00% 1
TOTAL	1

#	PLEASE EXPLAIN	DATE
1	We seem to have a lot of problems with roads and flooding	9/2/2020 2:41 PM

Q7 Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster resistant to support your department's ability to maintain operations and support response or recovery efforts?

Answered: 1 Skipped: 0

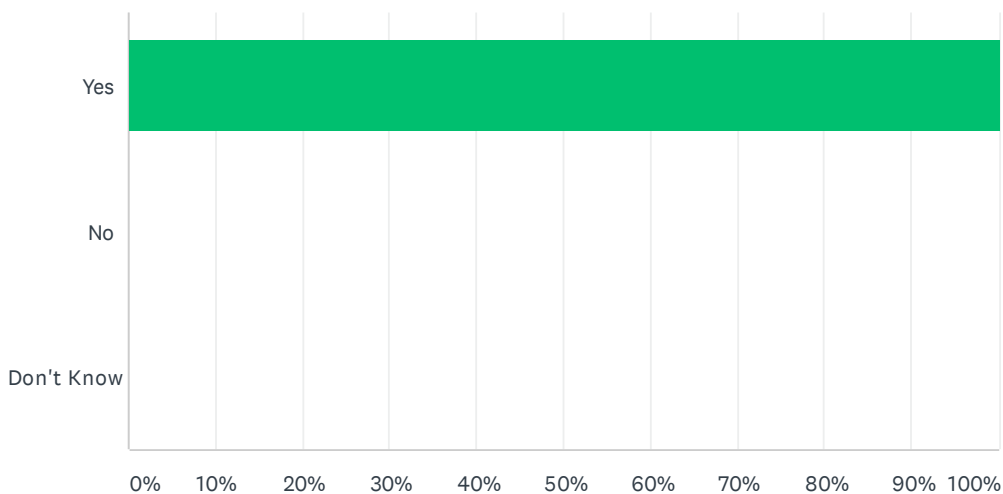


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	0.00% 0
Don't Know	100.00% 1
TOTAL	1

#	PLEASE EXPLAIN	DATE
1	Think power and communications need to be upgraded	9/2/2020 2:41 PM

Q8 Do you believe that hazard risks (e.g. flood zones, steep slopes, wildfire risk zones) are considered when local authorities consider land development and land use planning?

Answered: 1 Skipped: 0

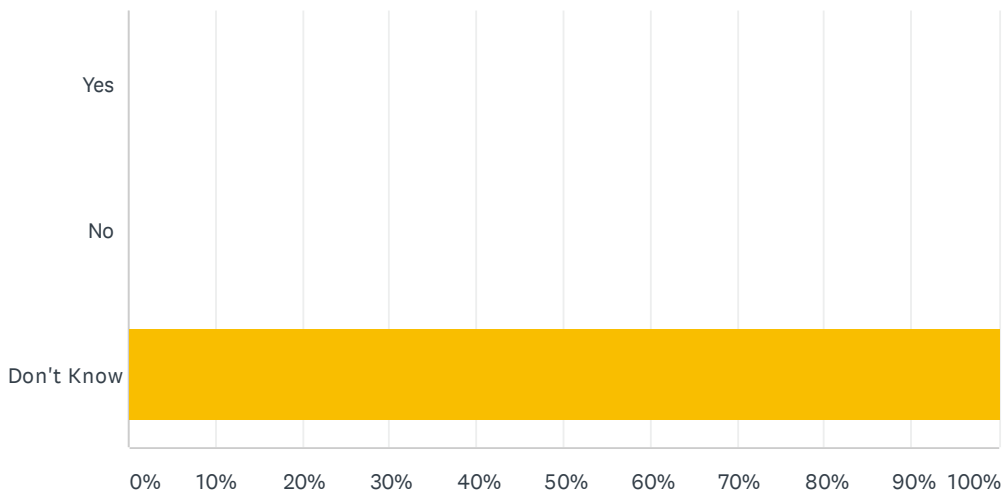


ANSWER CHOICES	RESPONSES
Yes	100.00% 1
No	0.00% 0
Don't Know	0.00% 0
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q9 Do you believe that business organizations/associations, chambers of commerce, etc., are a valuable resource in helping business owners protect themselves pre-disaster, and/or help in recovery post disaster?

Answered: 1 Skipped: 0

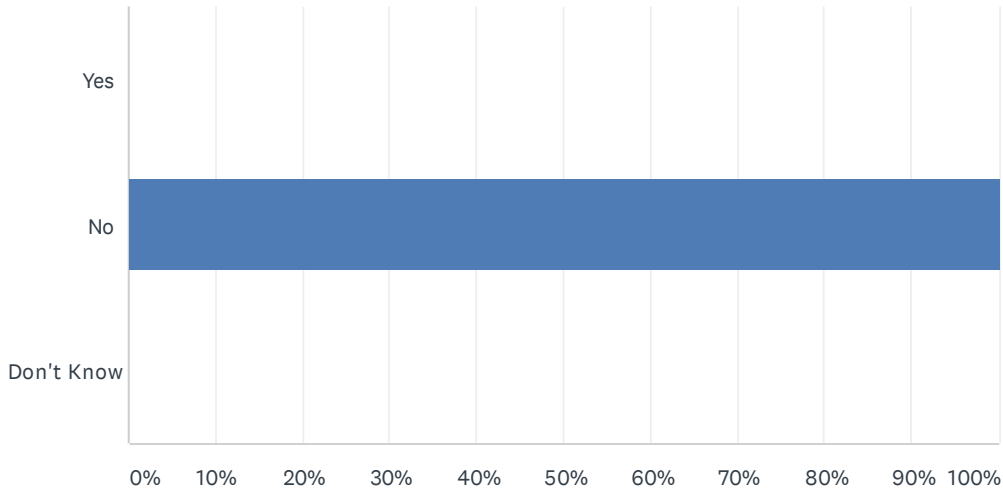


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	0.00% 0
Don't Know	100.00% 1
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q10 Do you believe that businesses are aware and take appropriate advantage of flood insurance and other risk management resources and programs to help protect them from losses, as well as to support recovery from disasters?

Answered: 1 Skipped: 0

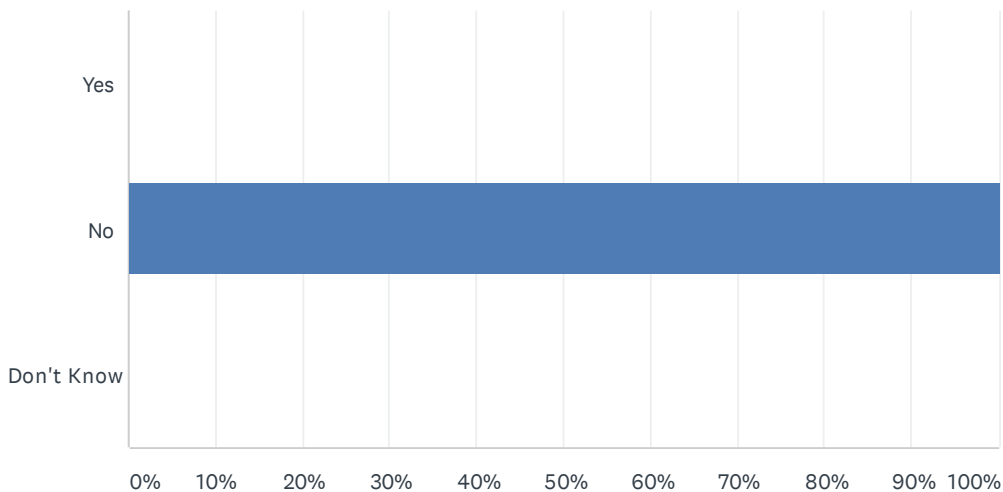


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	100.00% 1
Don't Know	0.00% 0
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q11 Do you believe that emergency planning, services, and equipment are adequate to manage and respond properly to disasters that may impact your business or commercial interests?

Answered: 1 Skipped: 0

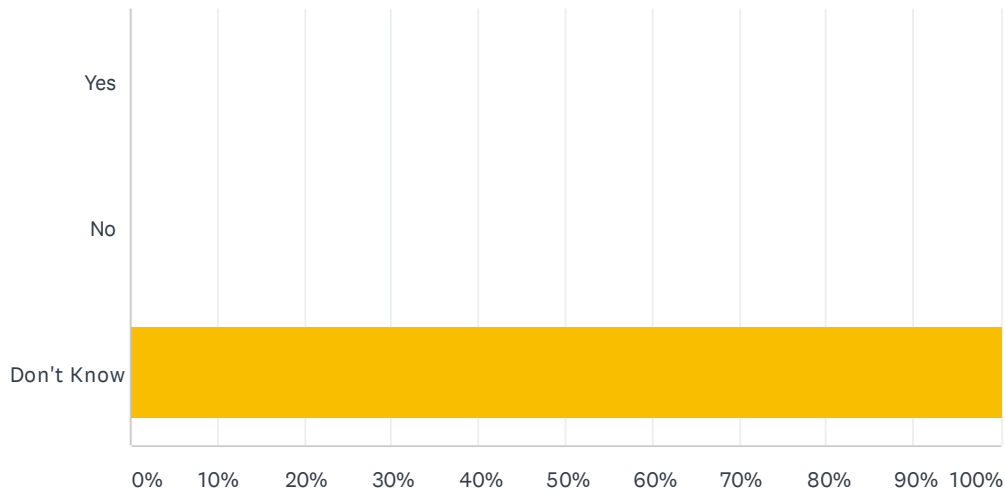


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	100.00% 1
Don't Know	0.00% 0
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q12 Do you think the local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

Answered: 1 Skipped: 0

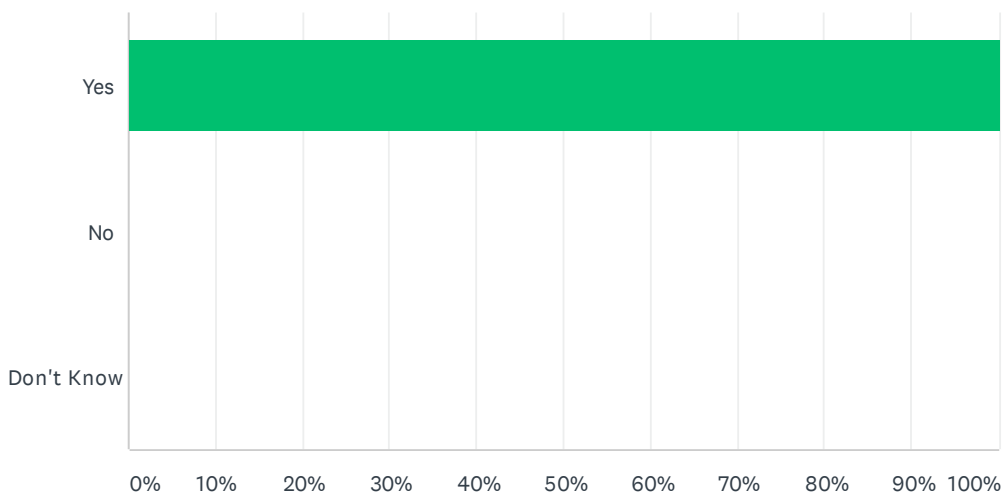


ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	0.00% 0
Don't Know	100.00% 1
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q13 Is your business included within and/or maintain a Business Continuity Plan? This type of plan examines your business's ability to perform minimum essential functions during any situation.

Answered: 1 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	100.00% 1
No	0.00% 0
Don't Know	0.00% 0
TOTAL	1

#	PLEASE EXPLAIN	DATE
	There are no responses.	

Q14 Can you identify projects or programs that you have implemented to reduce your business's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	Developed a business continuity plan. Worked with professional IT company.	9/2/2020 2:43 PM

Q15 Can you identify projects or programs that you would like or plan to implement to reduce your business's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	Perhaps offsite server	9/2/2020 2:43 PM

Q16 Do you have any other comments, questions, or concerns?

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	No	9/2/2020 2:43 PM

Q17 Name of Respondent

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	Miriam Matrangola	9/2/2020 2:43 PM

Q18 Contact information (email address or phone number) optional

Answered: 1 Skipped: 0

#	RESPONSES	DATE
1	mm@atlanticpensionservices.com	9/2/2020 2:43 PM



Chester County Hazard Mitigation Plan Update - Emergency Services Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a "blueprint" by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Emergency Services Survey

Please answer the following questions about hazards and how they affect emergency services (police, fire, and EMS) in Chester County. Please provide as much information as possible. Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of your department, district, or agency:

2. Type of services your department provides:

- Police
- Fire
- EMS
- Other (please specify)

3. Please identify your primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
| <input type="checkbox"/> Elverson (B) | <input type="checkbox"/> East Vincent (Twp) | <input type="checkbox"/> Upper Uwchlan (Twp) |
| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
| <input type="checkbox"/> Kennett Square (B) | <input type="checkbox"/> Easttown (Twp) | <input type="checkbox"/> Valley (Twp) |
| <input type="checkbox"/> Malvern (B) | <input type="checkbox"/> Elk (Twp) | <input type="checkbox"/> Wallace (Twp) |
| <input type="checkbox"/> Modena (B) | <input type="checkbox"/> Franklin (Twp) | <input type="checkbox"/> Warwick (Twp) |
| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
| <input type="checkbox"/> Parkesburg (B) | <input type="checkbox"/> Honey Brook (Twp) | <input type="checkbox"/> West Brandywine (Twp) |
| <input type="checkbox"/> Phoenixville (B) | <input type="checkbox"/> Kennett (Twp) | <input type="checkbox"/> West Caln (Twp) |
| <input type="checkbox"/> South Coatesville (B) | <input type="checkbox"/> London Britain (Twp) | <input type="checkbox"/> West Fallowfield (Twp) |
| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
| <input type="checkbox"/> Caln (Twp) | <input type="checkbox"/> New London (Twp) | <input type="checkbox"/> West Pikeland (Twp) |
| <input type="checkbox"/> Charlestown (Twp) | <input type="checkbox"/> Newlin (Twp) | <input type="checkbox"/> West Sadsbury (Twp) |
| <input type="checkbox"/> East Bradford (Twp) | <input type="checkbox"/> North Coventry (Twp) | <input type="checkbox"/> West Vincent (Twp) |
| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
| <input type="checkbox"/> East Caln (Twp) | <input type="checkbox"/> Pennsbury (Twp) | <input type="checkbox"/> Westtown (Twp) |
| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

4. Has your department been impacted by hazard events (damaged, closed for extended periods, etc.)?

Yes

No

If you answered "YES", please identify the events and provide a brief description of the damages or loss of service

5. Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, subsidence/sinkholes, etc.)?

Yes

No

I don't know

If yes, identify the facilities and their location.

6. Do you think that critical and essential facilities (incl. fire departments, police stations, EMS, hospitals and medical centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Yes

No

I don't know

Please explain

7. Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards?

- Yes
- No
- I don't know

Please explain



Chester County Hazard Mitigation Plan Update - Emergency Services Survey

8. Do you think that the utility infrastructure in the County (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support emergency services (police, fire, and EMS) after hazard events?

- Yes
- No
- I don't know

Please explain

9. Looking at the facilities your agency owns/operates, what facilities DO NOT have backup power generation capabilities?

10. Do you think that local public education and outreach programs are effective at informing residents on how to prepare for and reduce their risk to hazards, so as not to increase the need for emergency services during events?

- Yes
- No
- I don't know

Please explain

11. Do you think that road closure and pending road closure announcements are sufficiently accurate and available to support your department's functions during hazard events?

- Yes
- No
- I don't know

Please explain

12. Do you think that the public knows about, understands, and/or takes advantage of the County's emergency warning and notification systems (reverse 911, CodeRED, audible alerts, call and text services)?

- Yes
- No
- I don't know

Please explain

13. Do you think that your department/district works to inform your constituents of how they can better manage their risk to hazards (e.g. proper use of portable generators, driving during storms, etc.)?

- Yes
- No
- I don't know

Please explain

14. Do you feel that your department's emergency response planning, services, and equipment are adequate to manage and respond properly to disasters in your community?

- Yes
- No
- I don't know

Please explain

15. Do you think that local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

- Yes
- No
- I don't know

Please explain

16. Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of your organization's functions.

- Yes
- No
- I don't know

If "Yes", please explain.



Chester County Hazard Mitigation Plan Update - Emergency Services Survey

17. Can you identify projects or programs that you have implemented to reduce your department's vulnerability to damages and losses, including loss of operation/service, to hazard events?

18. Can you identify projects or programs that will reduce your department's vulnerability to damages and losses, including loss of operation/service, to hazard events?

19. Do you have any other comments, questions, or concerns?

20. Name of respondent:

21. Contact information (email address or phone number) - optional:

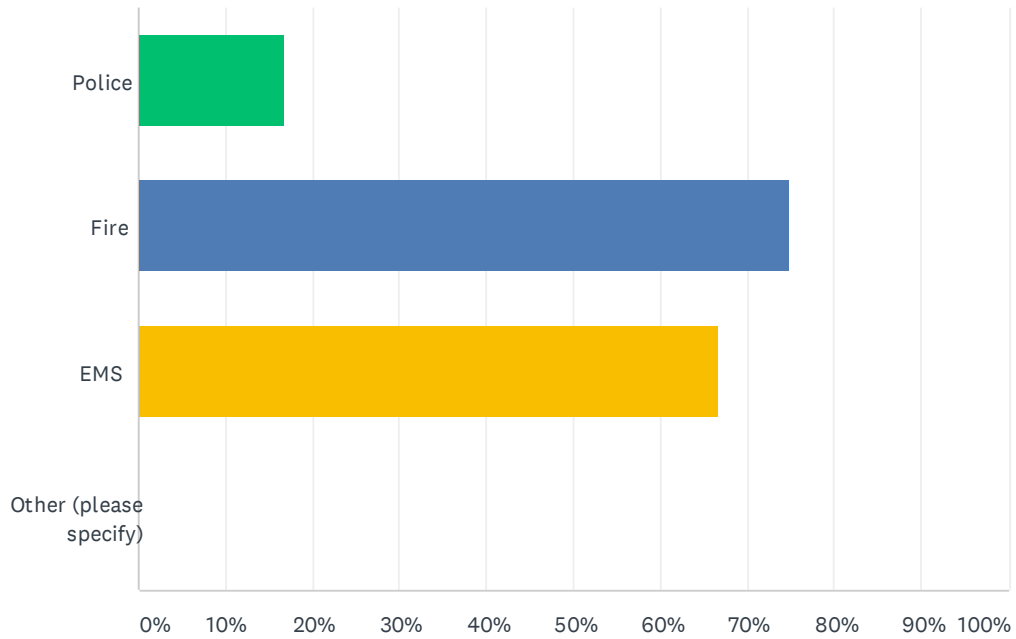
Q1 Name of your department, district, or agency:

Answered: 11 Skipped: 1

#	RESPONSES	DATE
1	Minquas Fire Co. No. 2 EMS	8/24/2020 6:06 AM
2	Honey Brook Fire Company	8/23/2020 11:01 PM
3	Twin Valley Fire Department	8/21/2020 11:31 AM
4	Coatesville Bureau of Fire	8/20/2020 3:27 PM
5	Uwchlan Ambulance Corps	8/20/2020 1:18 PM
6	Malvern Fire Company	8/20/2020 8:30 AM
7	Goshen Fire Company	8/19/2020 10:19 PM
8	East Whiteland Township	8/19/2020 8:59 PM
9	Wagontown Fire Company	8/19/2020 6:45 PM
10	Union Fire Company No. 1	8/19/2020 6:28 PM
11	Modena fire co. Ambulance	8/19/2020 5:40 PM

Q2 Type of services your department provides:

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
Police	16.67% 2
Fire	75.00% 9
EMS	66.67% 8
Other (please specify)	0.00% 0
Total Respondents: 12	

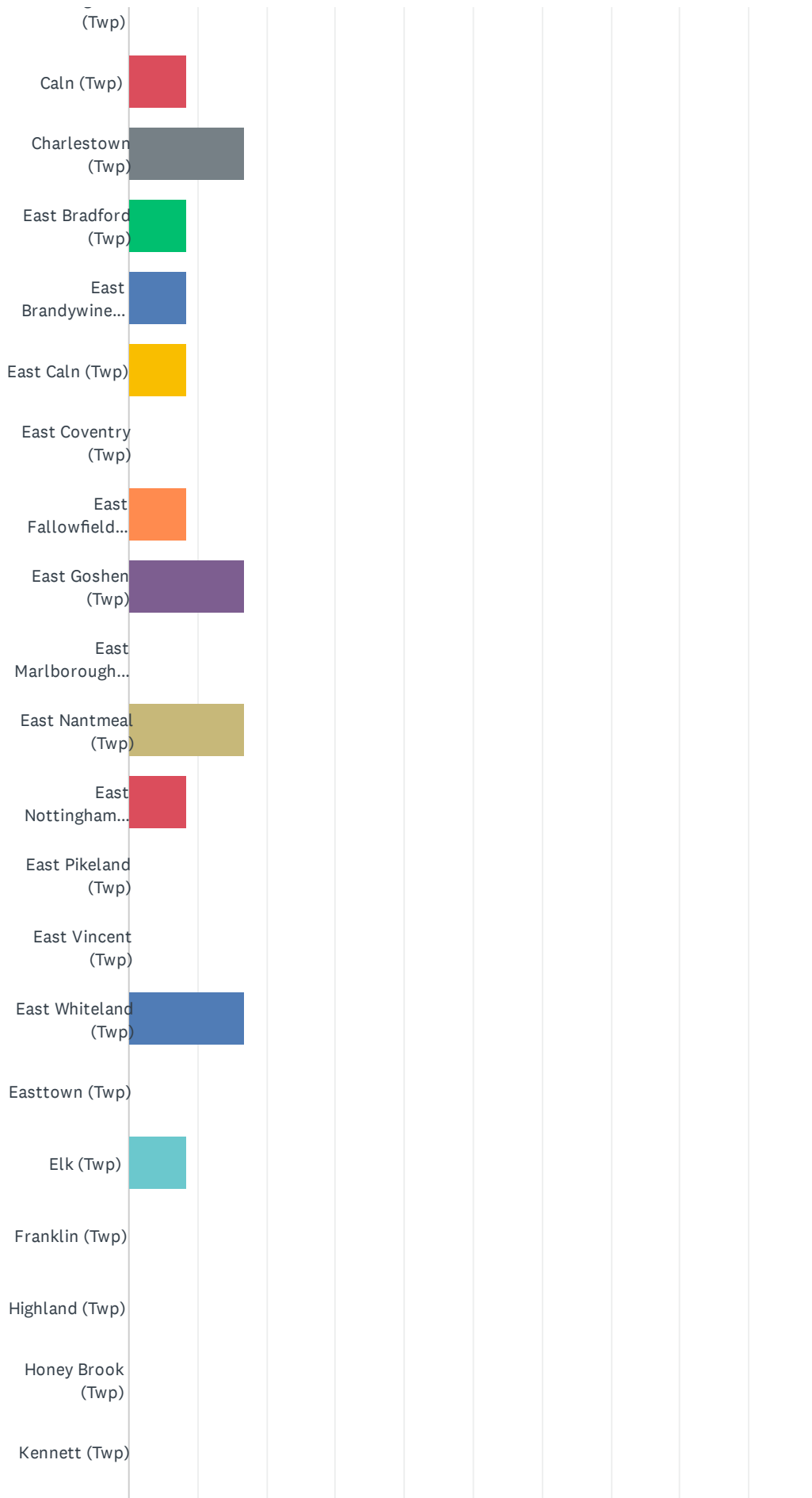
#	OTHER (PLEASE SPECIFY)	DATE
There are no responses.		

Q3 Please identify your primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

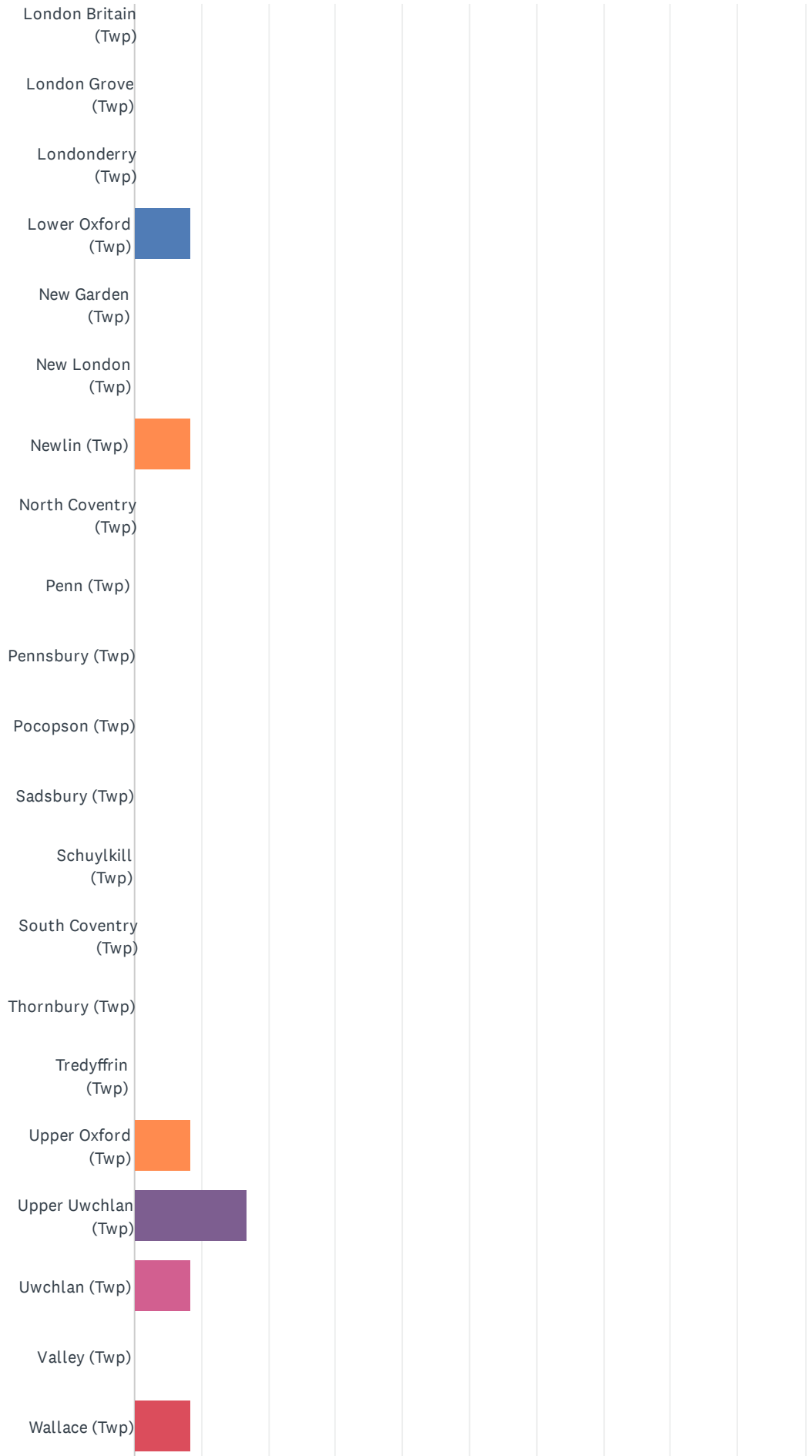
Answered: 12 Skipped: 0



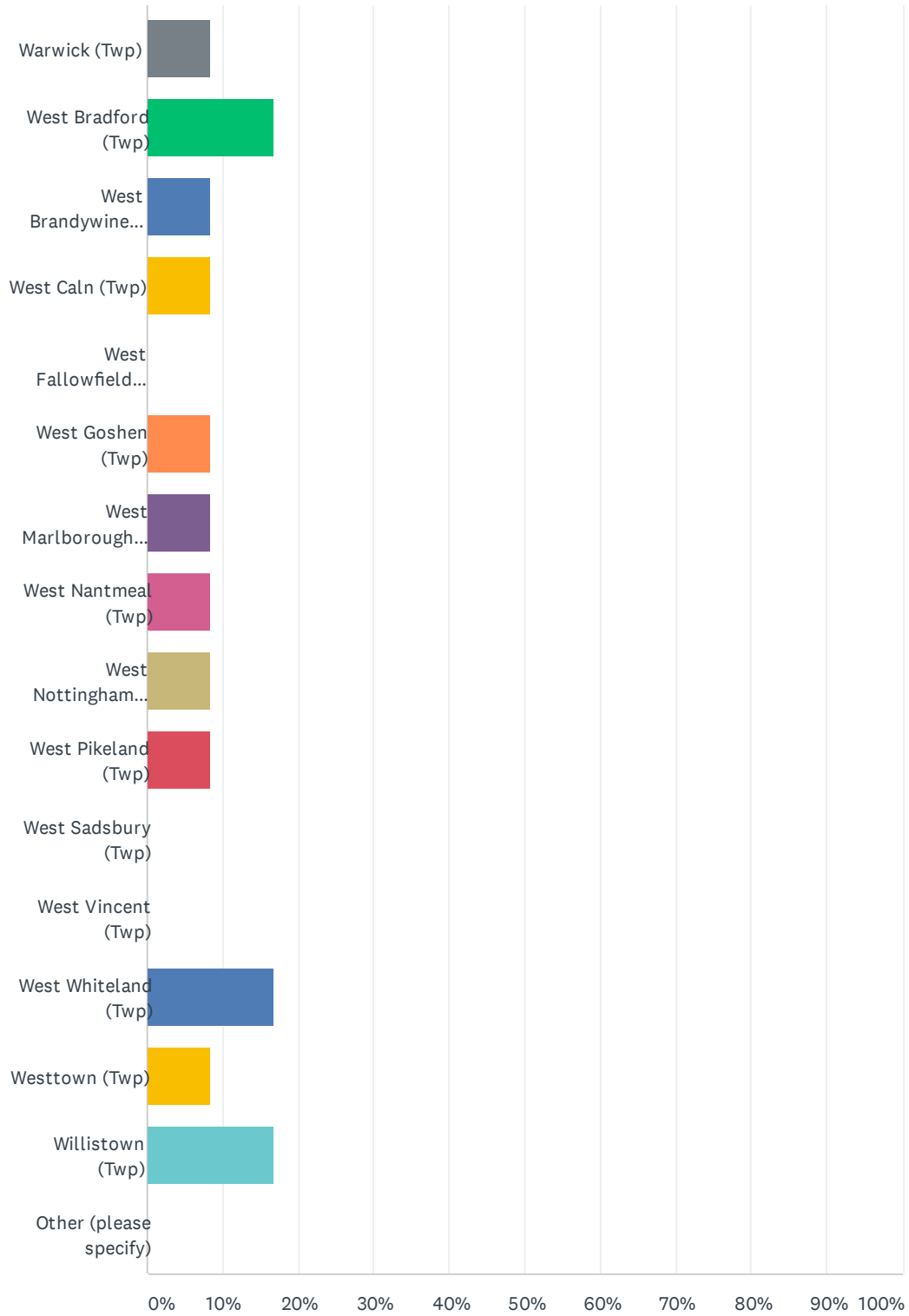
Chester County Hazard Mitigation Plan Update - Emergency Services Survey



Chester County Hazard Mitigation Plan Update - Emergency Services Survey



Chester County Hazard Mitigation Plan Update - Emergency Services Survey



Chester County Hazard Mitigation Plan Update - Emergency Services Survey

ANSWER CHOICES	RESPONSES	
Chester County (entire area)	0.00%	0
Coatesville (C)	8.33%	1
Atglen (B)	0.00%	0
Avondale (B)	0.00%	0
Downingtown (B)	8.33%	1
Elverson (B)	8.33%	1
Honey Brook (B)	8.33%	1
Kennett Square (B)	0.00%	0
Malvern (B)	8.33%	1
Modena (B)	8.33%	1
Oxford (B)	8.33%	1
Parkesburg (B)	0.00%	0
Phoenixville (B)	0.00%	0
South Coatesville (B)	8.33%	1
Spring City (B)	0.00%	0
West Chester (B)	0.00%	0
West Grove (B)	0.00%	0
Birmingham (Twp)	0.00%	0
Caln (Twp)	8.33%	1
Charlestown (Twp)	16.67%	2
East Bradford (Twp)	8.33%	1
East Brandywine (Twp)	8.33%	1
East Caln (Twp)	8.33%	1
East Coventry (Twp)	0.00%	0
East Fallowfield (Twp)	8.33%	1
East Goshen (Twp)	16.67%	2
East Marlborough (Twp)	0.00%	0
East Nantmeal (Twp)	16.67%	2
East Nottingham (Twp)	8.33%	1
East Pikeland (Twp)	0.00%	0
East Vincent (Twp)	0.00%	0
East Whiteland (Twp)	16.67%	2

Chester County Hazard Mitigation Plan Update - Emergency Services Survey

Easttown (Twp)	0.00%	0
Elk (Twp)	8.33%	1
Franklin (Twp)	0.00%	0
Highland (Twp)	0.00%	0
Honey Brook (Twp)	0.00%	0
Kennett (Twp)	0.00%	0
London Britain (Twp)	0.00%	0
London Grove (Twp)	0.00%	0
Londonderry (Twp)	0.00%	0
Lower Oxford (Twp)	8.33%	1
New Garden (Twp)	0.00%	0
New London (Twp)	0.00%	0
Newlin (Twp)	8.33%	1
North Coventry (Twp)	0.00%	0
Penn (Twp)	0.00%	0
Pennsbury (Twp)	0.00%	0
Pocopson (Twp)	0.00%	0
Sadsbury (Twp)	0.00%	0
Schuylkill (Twp)	0.00%	0
South Coventry (Twp)	0.00%	0
Thornbury (Twp)	0.00%	0
Tredyffrin (Twp)	0.00%	0
Upper Oxford (Twp)	8.33%	1
Upper Uwchlan (Twp)	16.67%	2
Uwchlan (Twp)	8.33%	1
Valley (Twp)	0.00%	0
Wallace (Twp)	8.33%	1
Warwick (Twp)	8.33%	1
West Bradford (Twp)	16.67%	2
West Brandywine (Twp)	8.33%	1
West Caln (Twp)	8.33%	1
West Fallowfield (Twp)	0.00%	0
West Goshen (Twp)	8.33%	1
West Marlborough (Twp)	8.33%	1

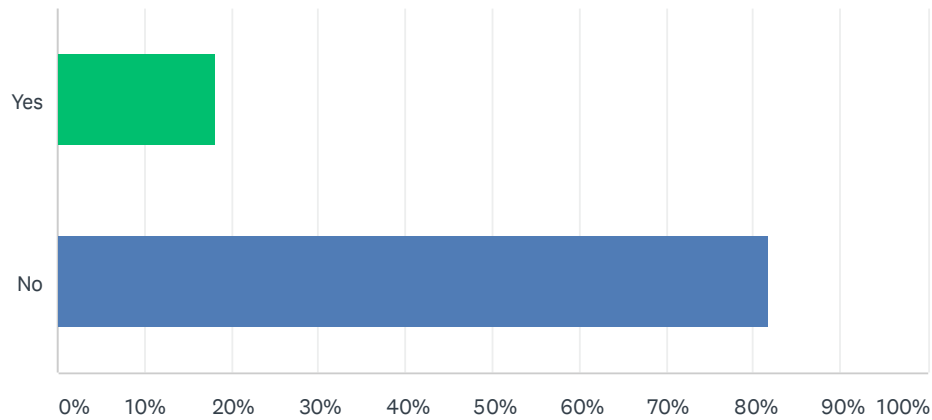
Chester County Hazard Mitigation Plan Update - Emergency Services Survey

West Nantmeal (Twp)	8.33%	1
West Nottingham (Twp)	8.33%	1
West Pikeland (Twp)	8.33%	1
West Sadsbury (Twp)	0.00%	0
West Vincent (Twp)	0.00%	0
West Whiteland (Twp)	16.67%	2
Westtown (Twp)	8.33%	1
Willistown (Twp)	16.67%	2
Other (please specify)	0.00%	0
Total Respondents: 12		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q4 Has your department been impacted by hazard events (damaged, closed for extended periods, etc.)?

Answered: 11 Skipped: 1

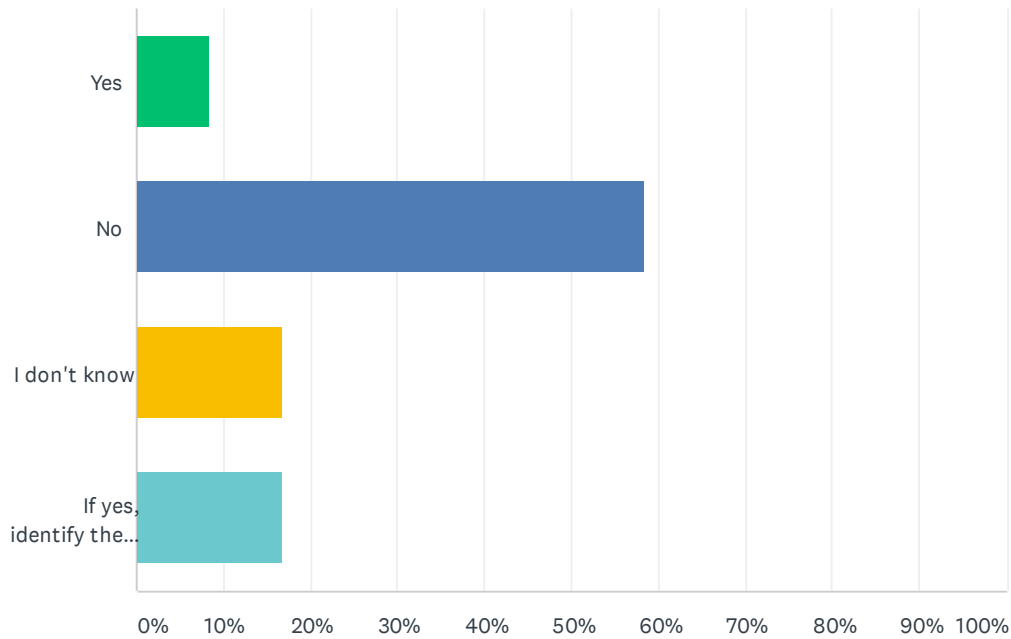


ANSWER CHOICES	RESPONSES
Yes	18.18% 2
No	81.82% 9
TOTAL	11

#	IF YOU ANSWERED "YES", PLEASE IDENTIFY THE EVENTS AND PROVIDE A BRIEF DESCRIPTION OF THE DAMAGES OR LOSS OF SERVICE	DATE
1	Roadways closed due to flooding, trees and wires.	8/19/2020 8:59 PM
2	Just this last storm we had several roadways blocked and critical infrastructure such as commercial power disrupted to multiple families for several days.	8/19/2020 6:45 PM

Q5 Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, subsidence/sinkholes, etc.)?

Answered: 12 Skipped: 0

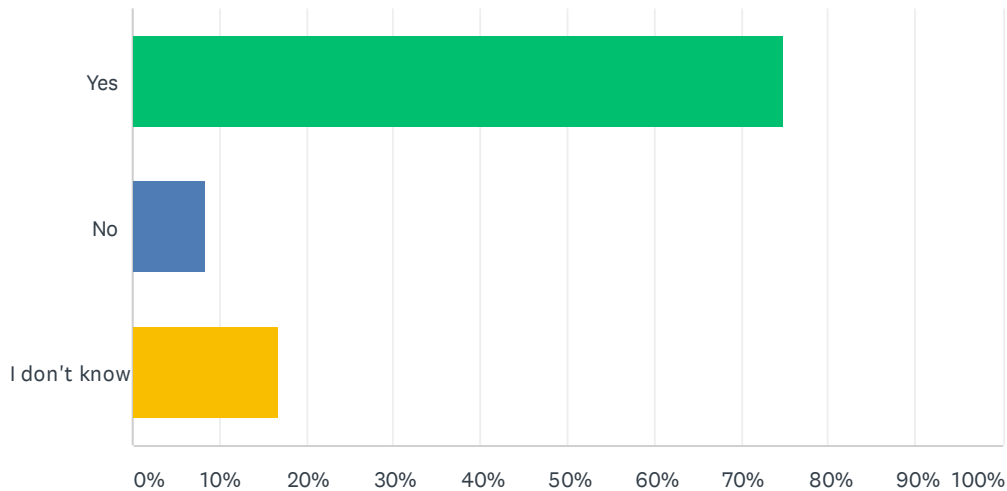


ANSWER CHOICES	RESPONSES
Yes	8.33% 1
No	58.33% 7
I don't know	16.67% 2
If yes, identify the facilities and their location.	16.67% 2
TOTAL	12

#	IF YES, IDENTIFY THE FACILITIES AND THEIR LOCATION.	DATE
1	Building is located in the floodplain of the East Branch of the Brandywine Creek	8/24/2020 6:06 AM
2	Hibernia Park large open space, lots of farmland and open space, Hibernia Dam, Coatesville Reservoir Dam	8/19/2020 6:45 PM

Q6 Do you think that critical and essential facilities (incl. fire departments, police stations, EMS, hospitals and medical centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 12 Skipped: 0

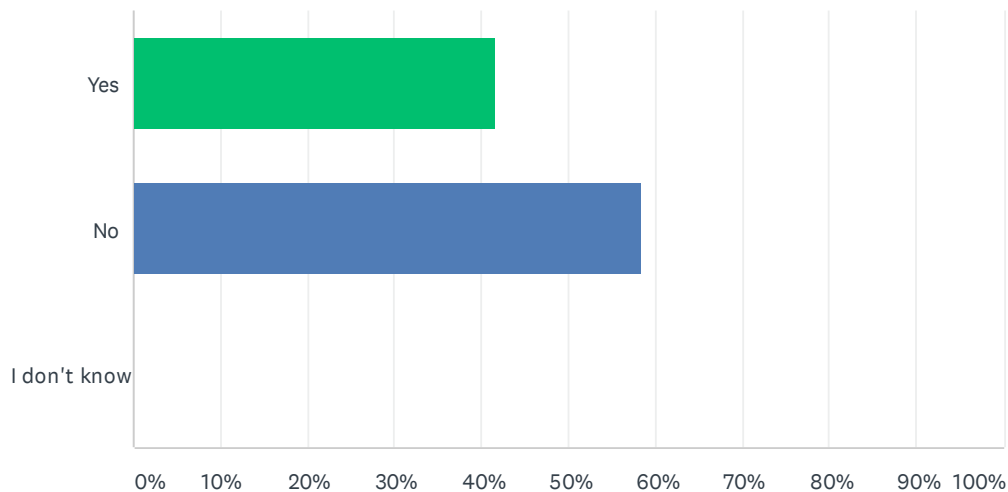


ANSWER CHOICES	RESPONSES
Yes	75.00% 9
No	8.33% 1
I don't know	16.67% 2
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	I can only speak for our locations, and I do feel that we are located in a safer area and we do have back up generator power readily available.	8/20/2020 1:18 PM
2	Speaking only for our facilities	8/19/2020 6:28 PM

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards?

Answered: 12 Skipped: 0

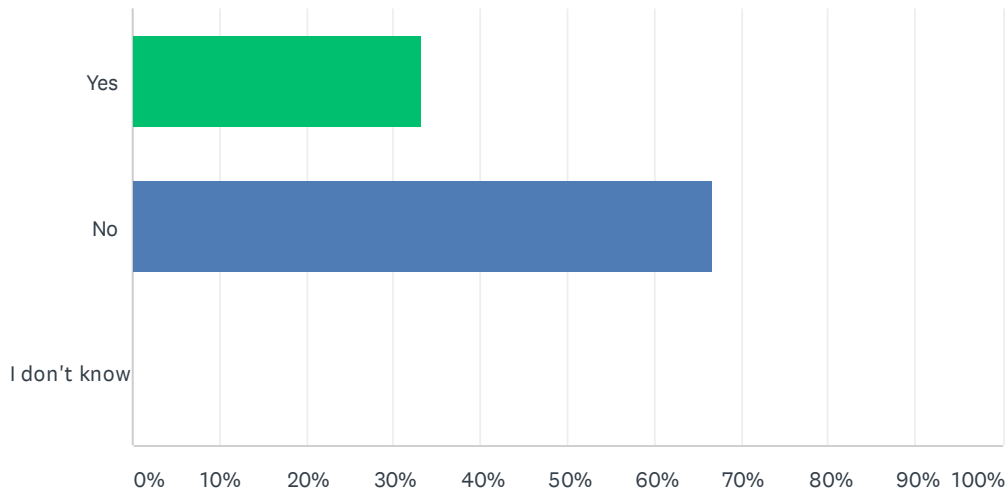


ANSWER CHOICES	RESPONSES
Yes	41.67% 5
No	58.33% 7
I don't know	0.00% 0
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	Need updated	9/1/2020 10:54 AM
2	We have multiple areas that flood and block access to high occupancy/high risk areas	8/23/2020 11:01 PM
3	Bridges are rated for less than truck weight do to deterioration and roads flood do to improper drainage	8/21/2020 11:31 AM
4	Our substation has only one way in / out. Should that road become blocked, we have no way to respond to calls outside of the immediate area.	8/20/2020 1:18 PM
5	I think Gridlock is due to limited throughfares leading out of the township. IE 29, 30, 401, Whitehorse and Charlestown Roads	8/19/2020 8:59 PM
6	We still have several old bridges that are in danger should we receive a large rainfall and flooding in those areas,	8/19/2020 6:45 PM
7	Infrastructure not designed for 100 year flood	8/19/2020 6:28 PM

Q8 Do you think that the utility infrastructure in the County (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support emergency services (police, fire, and EMS) after hazard events?

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	33.33% 4
No	66.67% 8
I don't know	0.00% 0
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	needs updated better planned out, (infrastructure)	9/1/2020 10:57 AM
2	We regularly loose power at the station.	8/24/2020 6:09 AM
3	phone companies don't respond in a timely fashion	8/21/2020 11:38 AM
4	Increased number of Trees / Wire Calls with major storms in past events.	8/20/2020 8:35 AM
5	Multiple power outages can hamper emergency services.	8/19/2020 10:24 PM
6	We see it all the time with the aerial lines that are impacted by falling trees	8/19/2020 6:46 PM
7	many power outages	8/19/2020 5:42 PM

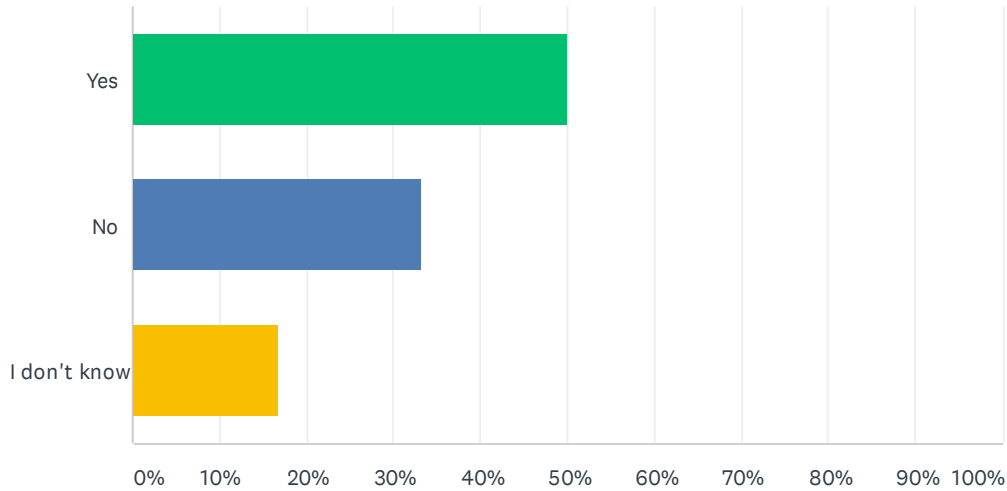
Q9 Looking at the facilities your agency owns/operates, what facilities DO NOT have backup power generation capabilities?

Answered: 11 Skipped: 1

#	RESPONSES	DATE
1	N/A	9/1/2020 10:57 AM
2	Only a small portion of our station is connected to the generator	8/24/2020 6:09 AM
3	All of our high risk facilities have back up power	8/23/2020 11:04 PM
4	none	8/21/2020 11:38 AM
5	West End Fire station	8/20/2020 3:30 PM
6	none	8/20/2020 1:20 PM
7	Neither	8/19/2020 10:24 PM
8	Limited portable generators for traffic light operations	8/19/2020 9:01 PM
9	Unsure	8/19/2020 6:46 PM
10	None	8/19/2020 6:31 PM
11	we have back up power	8/19/2020 5:42 PM

Q10 Do you think that local public education and outreach programs are effective at informing residents on how to prepare for and reduce their risk to hazards, so as not to increase the need for emergency services during events?

Answered: 12 Skipped: 0

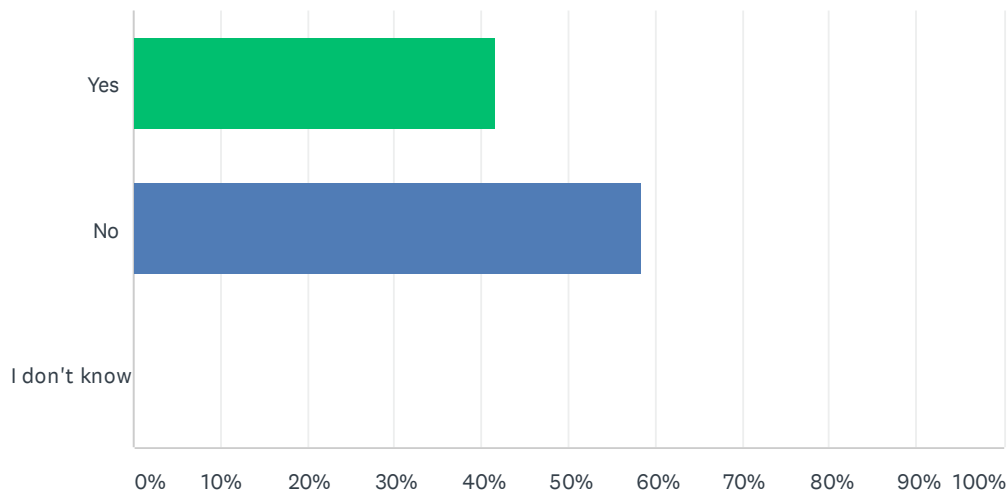


ANSWER CHOICES	RESPONSES	
Yes	50.00%	6
No	33.33%	4
I don't know	16.67%	2
TOTAL		12

#	PLEASE EXPLAIN	DATE
1	I haven't noticed any of these programs.	8/20/2020 1:20 PM
2	I think it can be improved to better educate and inform the community.	8/19/2020 9:01 PM

Q11 Do you think that road closure and pending road closure announcements are sufficiently accurate and available to support your department's functions during hazard events?

Answered: 12 Skipped: 0

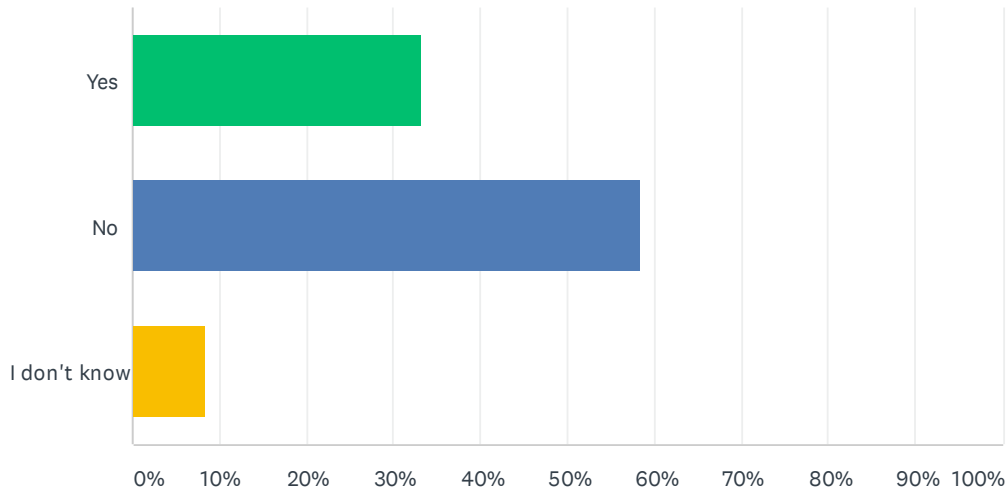


ANSWER CHOICES	RESPONSES
Yes	41.67% 5
No	58.33% 7
I don't know	0.00% 0
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	There are no alerts put out when there is flooding in our area. All warnings come from us via word of mouth or on social media.	8/23/2020 11:04 PM
2	we have road that is closed all the time for flooding but there is no signs to warn drivers of such	8/21/2020 11:38 AM
3	Delayed from Municipalities'. Traffic conditions should be added to incident information. Road Closure Tab could be added to the event page or dashboard.	8/20/2020 8:35 AM
4	Municipalities in local fail to properly report closures	8/19/2020 6:31 PM
5	not enough information as to location is sent out	8/19/2020 5:42 PM

Q12 Do you think that the public knows about, understands, and/or takes advantage of the County's emergency warning and notification systems (reverse 911, CodeRED, audible alerts, call and text services)?

Answered: 12 Skipped: 0

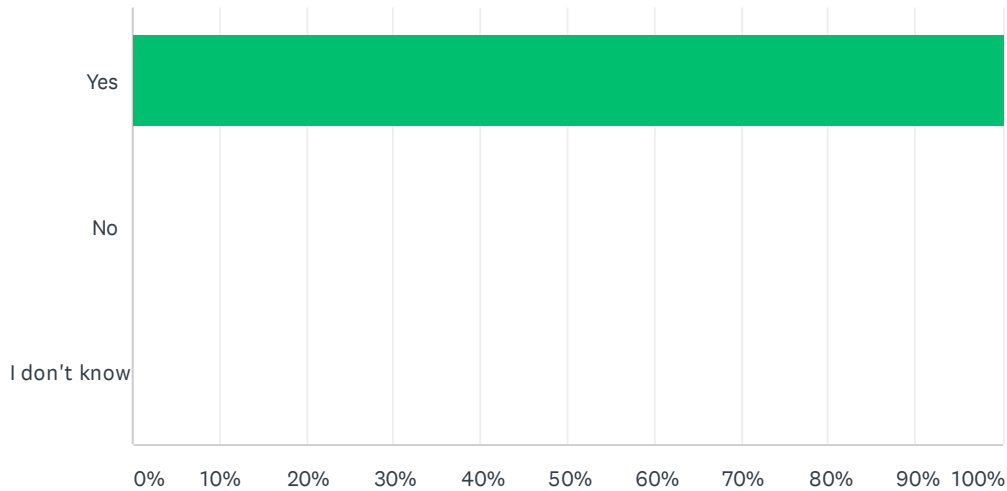


ANSWER CHOICES	RESPONSES
Yes	33.33% 4
No	58.33% 7
I don't know	8.33% 1
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	I don't believe the average citizen knows about these systems	8/21/2020 11:38 AM

Q13 Do you think that your department works to inform your constituents of how they can better manage their risk to hazards (e.g. proper use of portable generators, driving during storms, etc.)?

Answered: 12 Skipped: 0

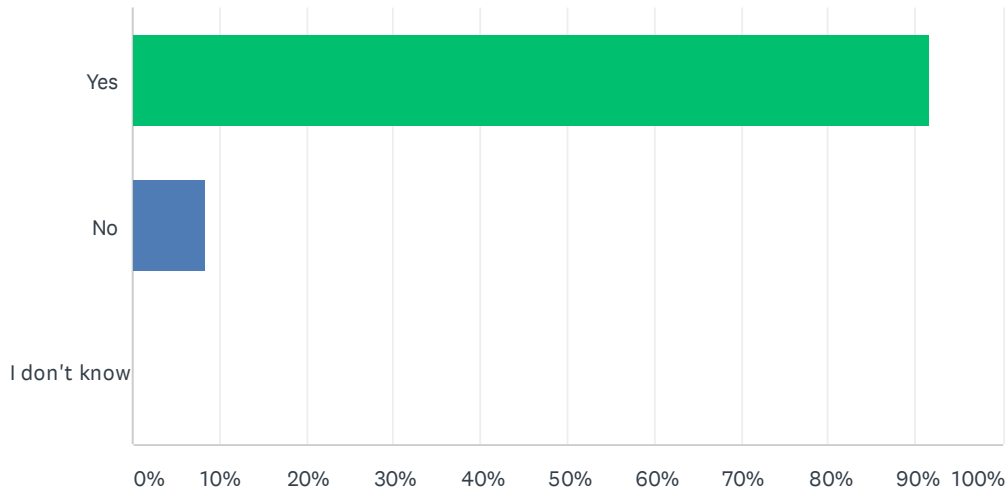


ANSWER CHOICES	RESPONSES
Yes	100.00% 12
No	0.00% 0
I don't know	0.00% 0
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	we put advisories on our social media	8/21/2020 11:38 AM
2	Post warning on FD facebook page and City website	8/20/2020 3:30 PM
3	Relay information to local community social media pages.	8/20/2020 8:35 AM

Q14 Do you feel that your department's emergency response planning, services, and equipment are adequate to manage and respond properly to disasters in your community?

Answered: 12 Skipped: 0

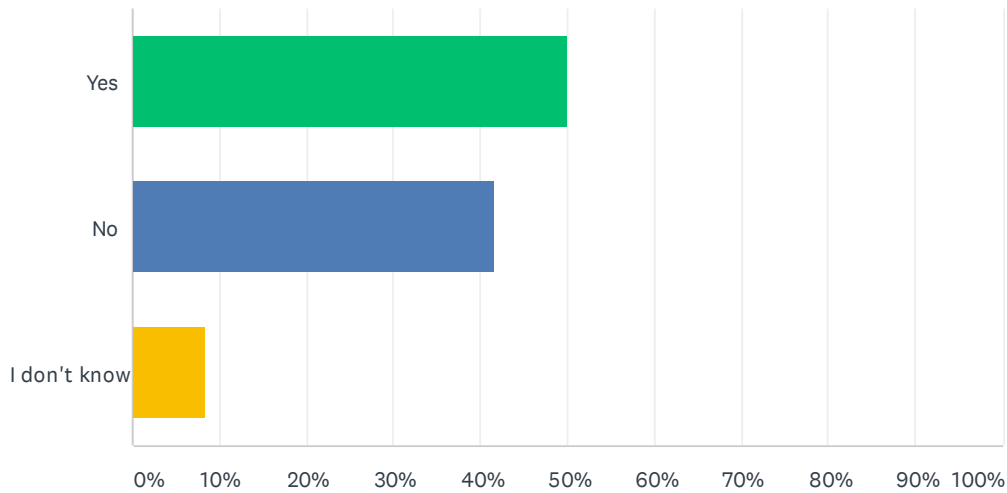


ANSWER CHOICES	RESPONSES
Yes	91.67% 11
No	8.33% 1
I don't know	0.00% 0
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	we handled a tornado touch down and flooding in previous years	8/21/2020 11:38 AM

Q15 Do you think that local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

Answered: 12 Skipped: 0

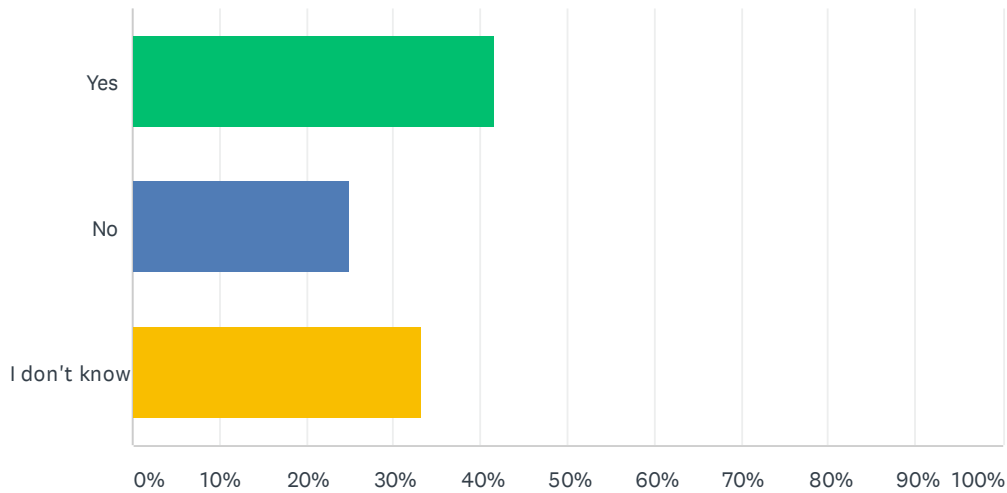


ANSWER CHOICES	RESPONSES
Yes	50.00% 6
No	41.67% 5
I don't know	8.33% 1
TOTAL	12

#	PLEASE EXPLAIN	DATE
1	The local government has very little education on what it takes to mitigate a hazardous situation. Although they do have some resources, they are limited on what they can do.	8/23/2020 11:04 PM
2	the municipalities don't have the proper staffing for maintenance departments to assist in large storms	8/21/2020 11:38 AM

Q16 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of your organization's functions.

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	41.67% 5
No	25.00% 3
I don't know	33.33% 4
TOTAL	12

#	IF "YES", PLEASE EXPLAIN.	DATE
1	We drafted a plan at the beginning of 2020.	8/20/2020 1:20 PM

Q17 Can you identify projects or programs that you have implemented to reduce your department's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 10 Skipped: 2

#	RESPONSES	DATE
1	pre plans & emergency action plans	9/1/2020 10:57 AM
2	COVID plans	8/24/2020 6:10 AM
3	We have a increase in manpower whenever there is an impending storm.	8/23/2020 11:06 PM
4	installed a generator that runs the complete station	8/21/2020 11:39 AM
5	Install new back up generators at city hall and 41 fire station	8/20/2020 3:32 PM
6	We have spread our resources through out our coverage area. This way if one station is impacted, hopefully the other 2 can seamlessly take over.	8/20/2020 1:21 PM
7	Increase staffing prior to anticipated events, constant communication to members on road closures, etc. modify COOP related to events i.e COVID and minimizing staffing / volunteer activities in and around station. Virtual meetings to reduce exposure risk among membership. room layouts related to proper social distancing.	8/20/2020 8:40 AM
8	Internal programs	8/19/2020 10:28 PM
9	Upgraded Fire department facilities with back up power generator.	8/19/2020 6:47 PM
10	SOG's, COOP	8/19/2020 6:32 PM

Q18 Can you identify projects or programs that will reduce your department's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 6 Skipped: 6

#	RESPONSES	DATE
1	Better communication with the local government when resources are needed.	8/23/2020 11:06 PM
2	no	8/20/2020 1:21 PM
3	Communication with PECO related to response to emergency, fire service is informed that they will respond within the hours.	8/20/2020 8:40 AM
4	Internal programs	8/19/2020 10:28 PM
5	We are working to maximize our EOC within the fire station to provide better situational awareness for events.	8/19/2020 6:47 PM
6	see above	8/19/2020 6:32 PM

Q19 Do you have any other comments, questions, or concerns?

Answered: 3 Skipped: 9

#	RESPONSES	DATE
1	N/A	9/1/2020 10:57 AM
2	no	8/20/2020 1:21 PM
3	No	8/19/2020 6:47 PM

Q20 Name of respondent:

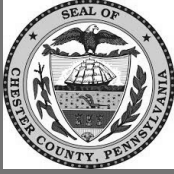
Answered: 11 Skipped: 1

#	RESPONSES	DATE
1	Mark Koenig	9/1/2020 10:57 AM
2	Fred Wurster	8/24/2020 6:10 AM
3	Jake Bailey	8/23/2020 11:06 PM
4	Tom Hornberger	8/21/2020 11:39 AM
5	Garry Alderman	8/20/2020 3:32 PM
6	Emily McCrthy	8/20/2020 1:21 PM
7	Jim Rapp, Chief	8/20/2020 8:40 AM
8	Chris O'Neill	8/19/2020 10:28 PM
9	Matt Fink	8/19/2020 9:02 PM
10	Todd Ziegler	8/19/2020 6:47 PM
11	Shane Kinsey	8/19/2020 6:32 PM

Q21 Contact information (email address or phone number) - optional:

Answered: 10 Skipped: 2

#	RESPONSES	DATE
1	610-842-1205	9/1/2020 10:57 AM
2	fred.wurster@minquas.org	8/24/2020 6:10 AM
3	484-639-4379	8/23/2020 11:06 PM
4	galderman@coatesville.org	8/20/2020 3:32 PM
5	emccarthy@station87.com	8/20/2020 1:21 PM
6	jrapp@malvernfireco.com	8/20/2020 8:40 AM
7	Chris.oneill@goshenfireco.org	8/19/2020 10:28 PM
8	mfink@eastwhiteland.org	8/19/2020 9:02 PM
9	tziegler@wagontownfire.com	8/19/2020 6:47 PM
10	Skinsey@oxfordfire.com	8/19/2020 6:32 PM



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a "blueprint" by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

Please review and answer the following questions regarding potential mitigation that affects hospitals and health care facilities within Chester County. Please provide as much information as possible.

Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of your hospital or health care facility:

2. What is your position/role at the facility?

3. Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
| <input type="checkbox"/> Elverson (B) | <input type="checkbox"/> East Vincent (Twp) | <input type="checkbox"/> Upper Uwchlan (Twp) |
| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
| <input type="checkbox"/> Kennett Square (B) | <input type="checkbox"/> Easttown (Twp) | <input type="checkbox"/> Valley (Twp) |
| <input type="checkbox"/> Malvern (B) | <input type="checkbox"/> Elk (Twp) | <input type="checkbox"/> Wallace (Twp) |
| <input type="checkbox"/> Modena (B) | <input type="checkbox"/> Franklin (Twp) | <input type="checkbox"/> Warwick (Twp) |
| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
| <input type="checkbox"/> Parkesburg (B) | <input type="checkbox"/> Honey Brook (Twp) | <input type="checkbox"/> West Brandywine (Twp) |
| <input type="checkbox"/> Phoenixville (B) | <input type="checkbox"/> Kennett (Twp) | <input type="checkbox"/> West Caln (Twp) |
| <input type="checkbox"/> South Coatesville (B) | <input type="checkbox"/> London Britain (Twp) | <input type="checkbox"/> West Fallowfield (Twp) |
| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
| <input type="checkbox"/> Caln (Twp) | <input type="checkbox"/> New London (Twp) | <input type="checkbox"/> West Pikeland (Twp) |
| <input type="checkbox"/> Charlestown (Twp) | <input type="checkbox"/> Newlin (Twp) | <input type="checkbox"/> West Sadsbury (Twp) |
| <input type="checkbox"/> East Bradford (Twp) | <input type="checkbox"/> North Coventry (Twp) | <input type="checkbox"/> West Vincent (Twp) |
| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
| <input type="checkbox"/> East Caln (Twp) | <input type="checkbox"/> Pennsbury (Twp) | <input type="checkbox"/> Westtown (Twp) |
| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

4. Have your facilities been impacted by hazard events (damaged, closed for extended periods, etc.)?

Yes

No

If you answered "YES", please identify the events and provide a brief description of the damages or loss of service

5. Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, subsidence/sinkholes, etc.)?

Yes

No

I don't know

If yes, please provide facility names and locations.

6. Do you think that critical and essential facilities (including hospitals and medical centers, EMS facilities, schools, etc.) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Yes

No

I don't know

Please explain

7. Looking at the facilities owned/operated by your organization, are there any facilities that DO NOT have backup power generation capabilities?

- Yes
- No
- I don't know

If there are facilities without backup power, please provide the name and location of the building.

8. Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazard events?

- Yes
- No
- I don't know

Please explain



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

9. Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support your facility's health care functions during and after hazard events?

- Yes
- No
- I don't know

Please explain

10. Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to disasters, so as not to increase the need for health care services during hazard events?

- Yes
- No
- I don't know

Please explain

11. Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support hospital functions during hazard events?

- Yes
- No
- I don't know

Please explain

12. Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, PERS, audible alerts, cell and text services, Alert PA, CodeRED)?

- Yes
- No
- I don't know

Please explain

13. Do you think that your organization works to inform employees, medical professionals, residents, and patients of how they can better manage their risk to hazard events?

- Yes
- No
- Not applicable

Please explain

14. Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to disasters in your community?

- Yes
- No
- I don't know

Please explain

15. Do you think that local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

- Yes
- No
- I don't know

Please explain

16. Does your organization maintain a Business Continuity Plan?

- Yes
- No
- I don't know

If "Yes", please explain.



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

17. Can you identify projects or programs that you have implemented to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

18. Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

19. Do you have any other comments, questions, or concerns?

20. Name of respondent:

21. Contact information (email address or phone number) - optional:

Q1 Name of your hospital or health care facility:

Answered: 16 Skipped: 0

#	RESPONSES	DATE
1	Preston Residence, Jenners Pond RCC	8/31/2020 6:43 AM
2	Kendal-Crosslands Communities	8/27/2020 12:05 PM
3	Heatherwood Retirement Community	8/25/2020 9:03 AM
4	Tower Health	8/25/2020 5:59 AM
5	Brandywine Hospital	8/24/2020 3:17 PM
6	Exton Senior Living	8/24/2020 10:07 AM
7	Camilla Hall	8/23/2020 6:24 PM
8	Phoenix Center	8/20/2020 1:42 PM
9	Hickory House	8/20/2020 1:11 PM
10	Holisticare Hospice	8/20/2020 10:58 AM
11	Brightview Devon	8/20/2020 9:20 AM
12	Brandywine Hospital	8/20/2020 7:10 AM
13	VAMC Coatesville	8/19/2020 8:34 PM
14	Brandywine Hall	8/19/2020 6:09 PM
15	Tel Hai Retirement Community	8/19/2020 5:12 PM
16	Woodbridge Place	8/19/2020 4:55 PM

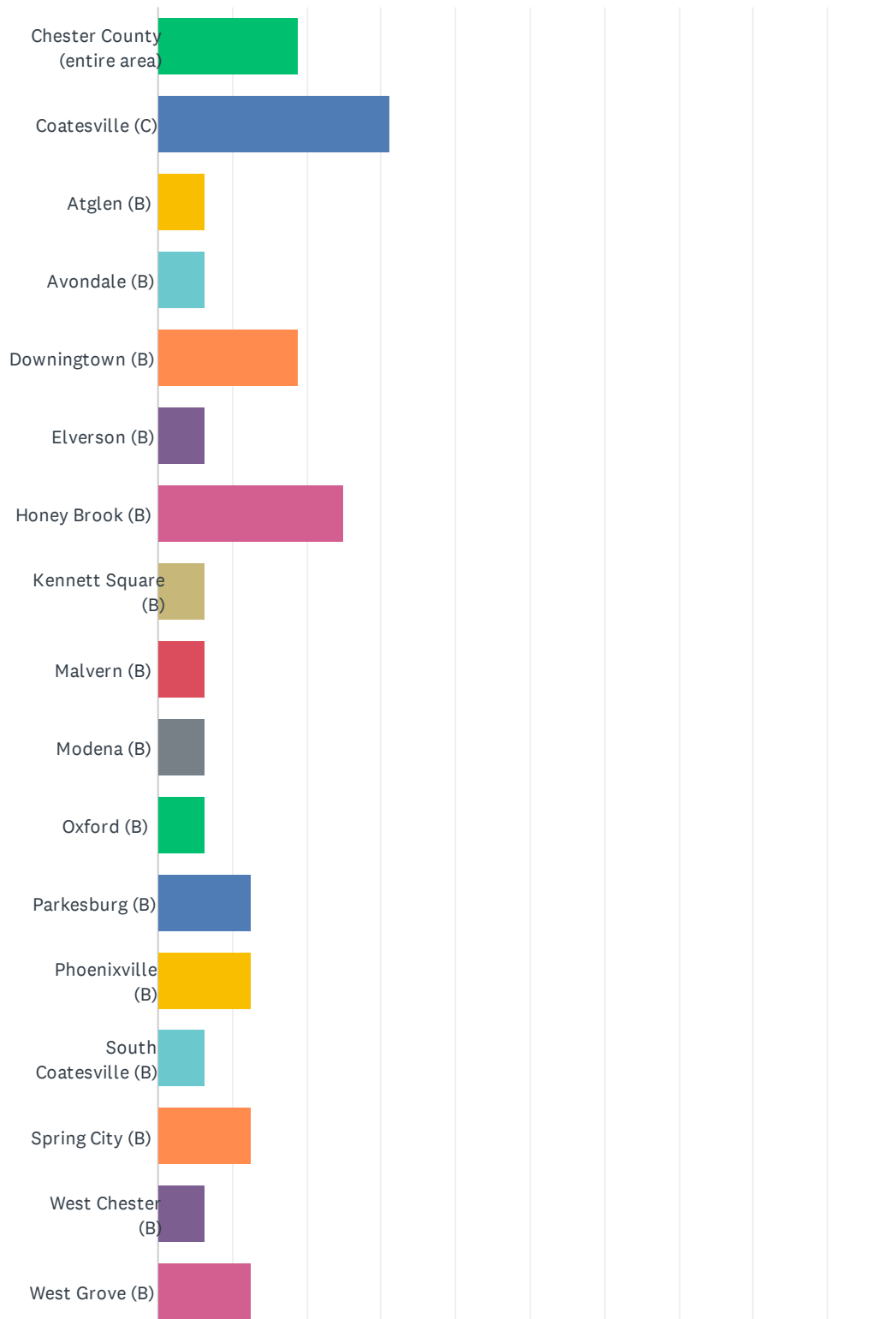
Q2 What is your position/role at the facility?

Answered: 16 Skipped: 0

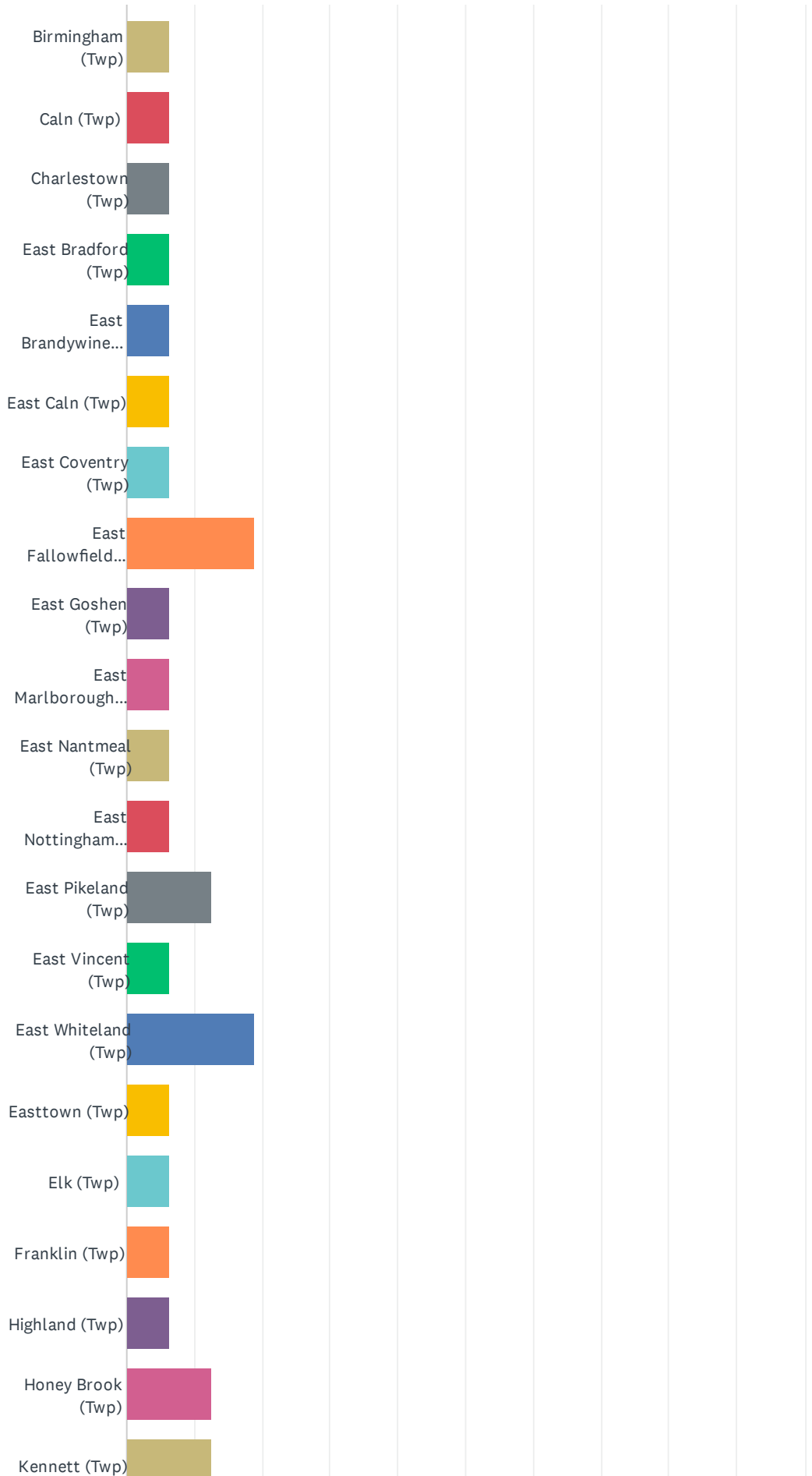
#	RESPONSES	DATE
1	Administrator	8/31/2020 6:43 AM
2	Chief Health Services Officer	8/27/2020 12:05 PM
3	Executive Director	8/25/2020 9:03 AM
4	Regional Director	8/25/2020 5:59 AM
5	Admin	8/24/2020 3:17 PM
6	Executive Director	8/24/2020 10:07 AM
7	Administrator	8/23/2020 6:24 PM
8	Administrator	8/20/2020 1:42 PM
9	Director of Nursing	8/20/2020 1:11 PM
10	COO/Administrator	8/20/2020 10:58 AM
11	Executive Director	8/20/2020 9:20 AM
12	Director of Security and Emergency Preparedness	8/20/2020 7:10 AM
13	Nurse Executive	8/19/2020 8:34 PM
14	Center Executive Director	8/19/2020 6:09 PM
15	Executive Vice President, Operations	8/19/2020 5:12 PM
16	Executive Director	8/19/2020 4:55 PM

Q3 Please identify the location of your facility(ies) and or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is county-wide:

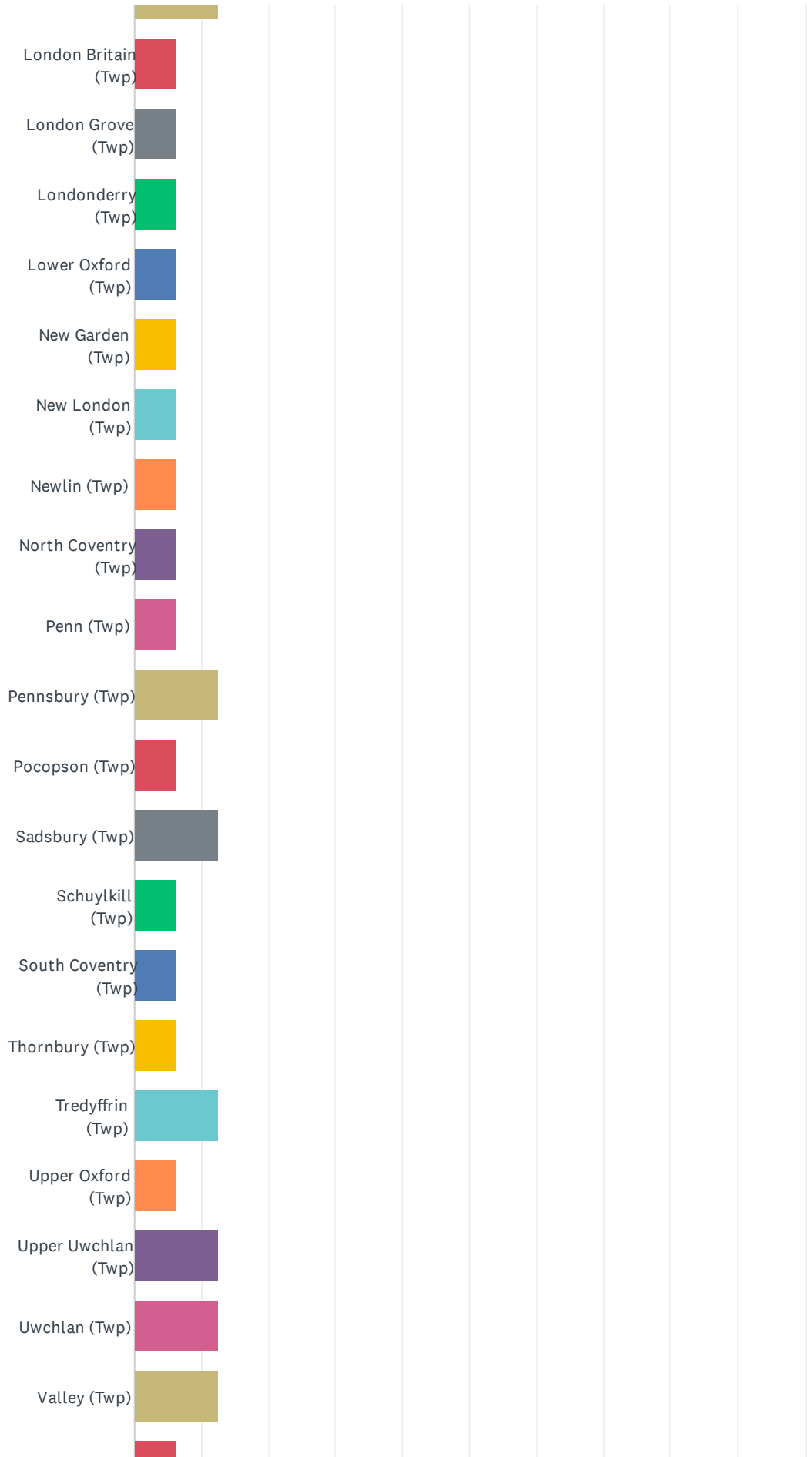
Answered: 16 Skipped: 0



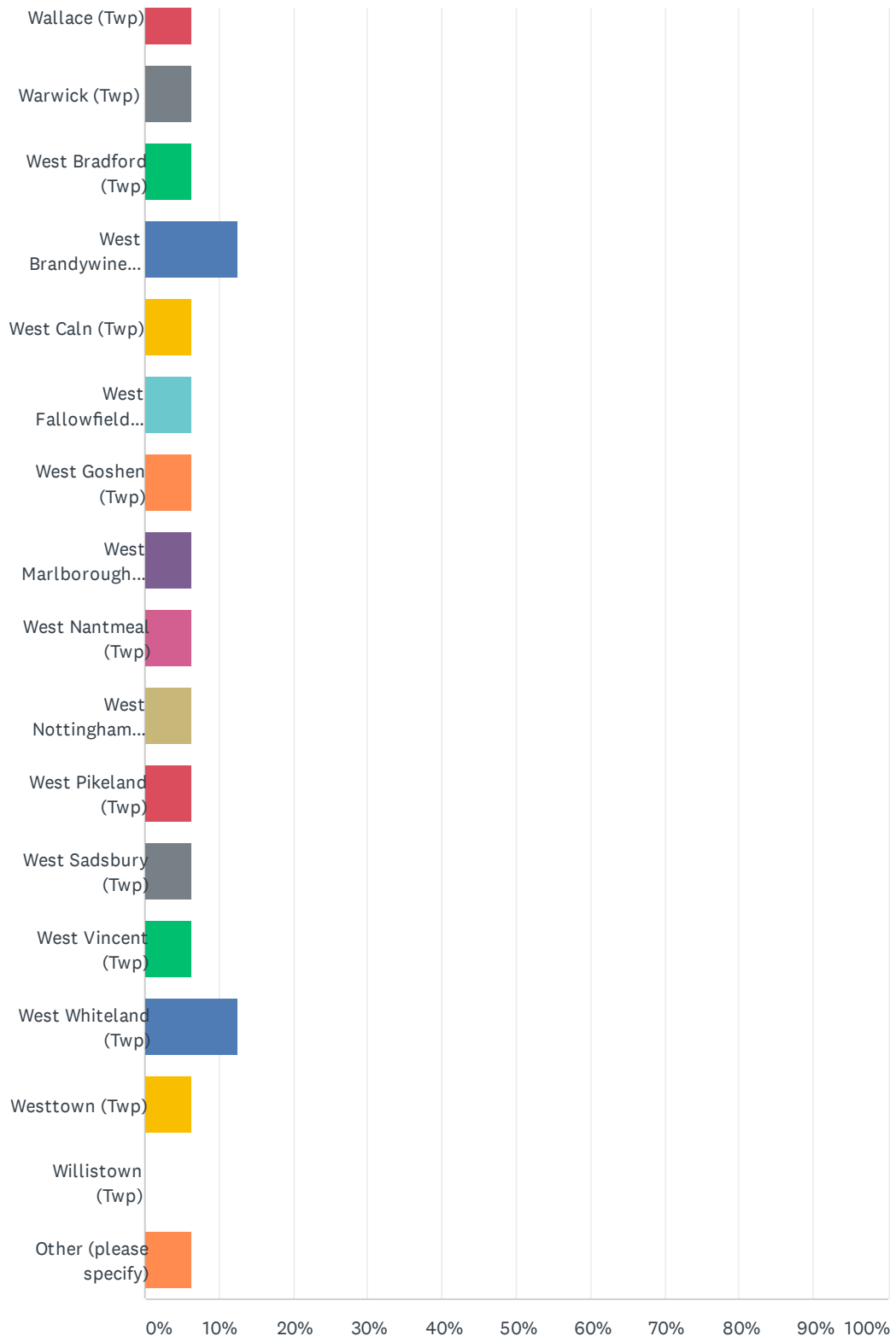
Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey



Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

ANSWER CHOICES	RESPONSES	
Chester County (entire area)	18.75%	3
Coatesville (C)	31.25%	5
Atglen (B)	6.25%	1
Avondale (B)	6.25%	1
Downingtown (B)	18.75%	3
Elverson (B)	6.25%	1
Honey Brook (B)	25.00%	4
Kennett Square (B)	6.25%	1
Malvern (B)	6.25%	1
Modena (B)	6.25%	1
Oxford (B)	6.25%	1
Parkesburg (B)	12.50%	2
Phoenixville (B)	12.50%	2
South Coatesville (B)	6.25%	1
Spring City (B)	12.50%	2
West Chester (B)	6.25%	1
West Grove (B)	12.50%	2
Birmingham (Twp)	6.25%	1
Caln (Twp)	6.25%	1
Charlestown (Twp)	6.25%	1
East Bradford (Twp)	6.25%	1
East Brandywine (Twp)	6.25%	1
East Caln (Twp)	6.25%	1
East Coventry (Twp)	6.25%	1
East Fallowfield (Twp)	18.75%	3
East Goshen (Twp)	6.25%	1
East Marlborough (Twp)	6.25%	1
East Nantmeal (Twp)	6.25%	1
East Nottingham (Twp)	6.25%	1
East Pikeland (Twp)	12.50%	2
East Vincent (Twp)	6.25%	1
East Whiteland (Twp)	18.75%	3

Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

Easttown (Twp)	6.25%	1
Elk (Twp)	6.25%	1
Franklin (Twp)	6.25%	1
Highland (Twp)	6.25%	1
Honey Brook (Twp)	12.50%	2
Kennett (Twp)	12.50%	2
London Britain (Twp)	6.25%	1
London Grove (Twp)	6.25%	1
Londonderry (Twp)	6.25%	1
Lower Oxford (Twp)	6.25%	1
New Garden (Twp)	6.25%	1
New London (Twp)	6.25%	1
Newlin (Twp)	6.25%	1
North Coventry (Twp)	6.25%	1
Penn (Twp)	6.25%	1
Pennsbury (Twp)	12.50%	2
Pocopson (Twp)	6.25%	1
Sadsbury (Twp)	12.50%	2
Schuylkill (Twp)	6.25%	1
South Coventry (Twp)	6.25%	1
Thornbury (Twp)	6.25%	1
Tredyffrin (Twp)	12.50%	2
Upper Oxford (Twp)	6.25%	1
Upper Uwchlan (Twp)	12.50%	2
Uwchlan (Twp)	12.50%	2
Valley (Twp)	12.50%	2
Wallace (Twp)	6.25%	1
Warwick (Twp)	6.25%	1
West Bradford (Twp)	6.25%	1
West Brandywine (Twp)	12.50%	2
West Caln (Twp)	6.25%	1
West Fallowfield (Twp)	6.25%	1
West Goshen (Twp)	6.25%	1
West Marlborough (Twp)	6.25%	1

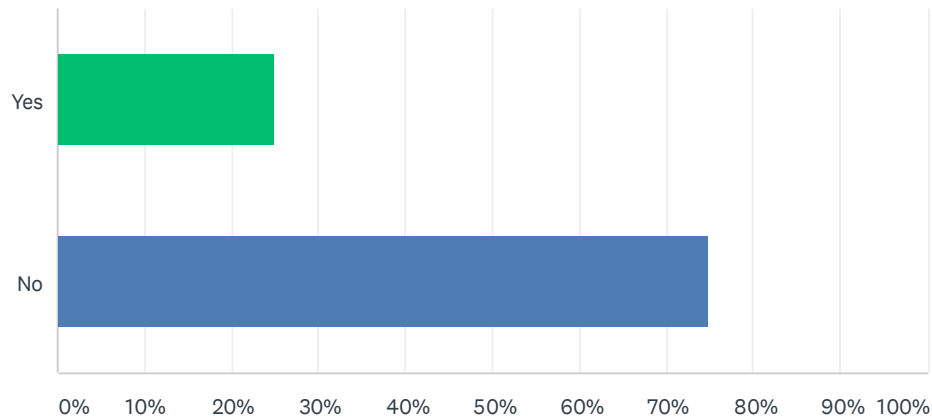
Chester County Hazard Mitigation Plan Update - Hospital and Health Care Provider Survey

West Nantmeal (Twp)	6.25%	1
West Nottingham (Twp)	6.25%	1
West Pikeland (Twp)	6.25%	1
West Sadsbury (Twp)	6.25%	1
West Vincent (Twp)	6.25%	1
West Whiteland (Twp)	12.50%	2
Westtown (Twp)	6.25%	1
Willistown (Twp)	0.00%	0
Other (please specify)	6.25%	1
Total Respondents: 16		

#	OTHER (PLEASE SPECIFY)	DATE
1	Exton,	8/24/2020 3:17 PM

Q4 Have your facilities been impacted by hazard events (damaged, closed for extended periods, etc.)?

Answered: 16 Skipped: 0

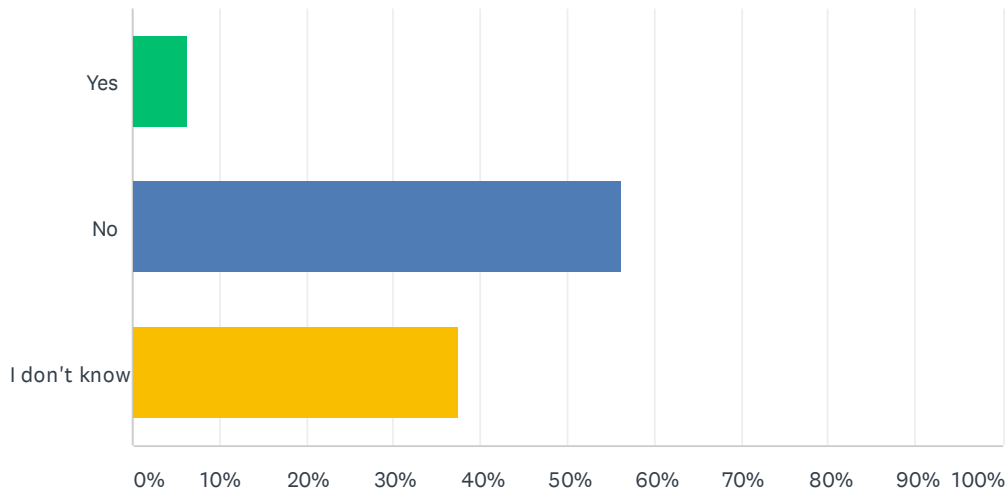


ANSWER CHOICES	RESPONSES	
Yes	25.00%	4
No	75.00%	12
TOTAL		16

#	IF YOU ANSWERED "YES", PLEASE IDENTIFY THE EVENTS AND PROVIDE A BRIEF DESCRIPTION OF THE DAMAGES OR LOSS OF SERVICE	DATE
1	Severe storms have caused some fallen trees on the property to block various roadways on our property; power outages in areas where we don't have generators.	8/27/2020 12:05 PM
2	Loss of electrical power has had the greatest impact on our operations. Delivery of some care services, e.g. use of oxygen concentration, electric beds, chairs, use of elevators for food service delivery, etc. exceed the capacity of our electrical generators.	8/23/2020 6:24 PM
3	loss of power in Patient's homes and facilities.	8/20/2020 10:58 AM
4	2018 flooding	8/20/2020 9:20 AM
5	We have had flooding and downed trees and some loss of power but not for extended periods.	8/19/2020 8:34 PM
6	Yes if you are considering being closed to COVID outbreak and loss of PPE supplies	8/19/2020 6:09 PM

Q5 Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, subsidence/sinkholes, etc.)?

Answered: 16 Skipped: 0

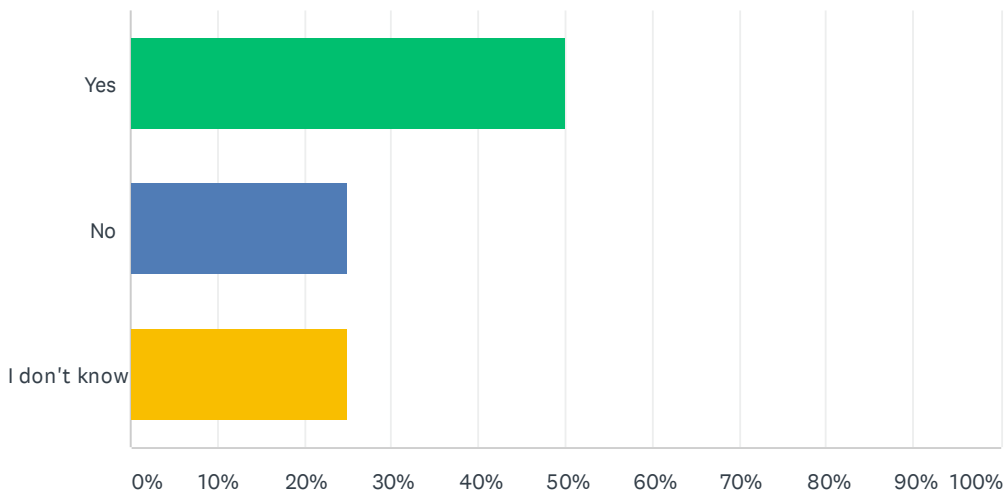


ANSWER CHOICES	RESPONSES
Yes	6.25% 1
No	56.25% 9
I don't know	37.50% 6
TOTAL	16

#	IF YES, PLEASE PROVIDE FACILITY NAMES AND LOCATIONS.	DATE
1	Town of Honeybrook - flooding	8/20/2020 10:58 AM

Q6 Do you think that critical and essential facilities (including hospitals and medical centers, EMS facilities, schools, etc.) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

Answered: 16 Skipped: 0

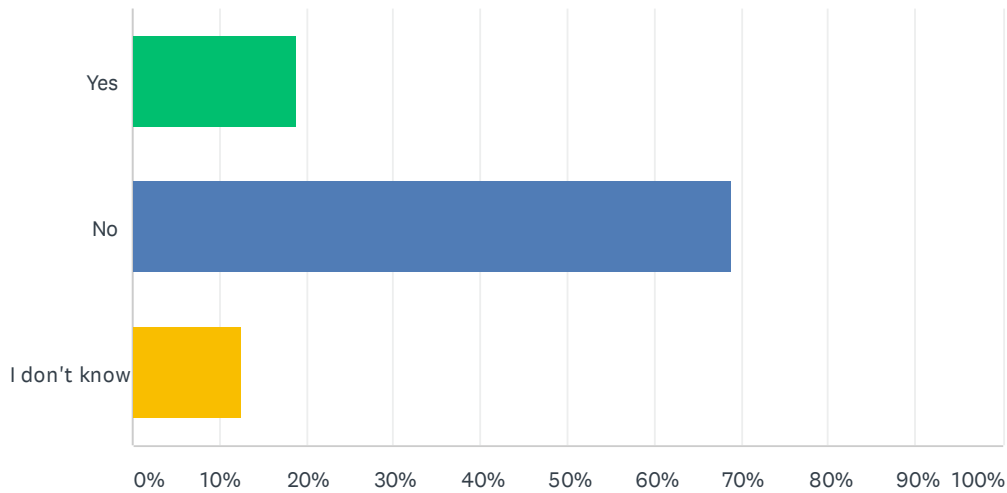


ANSWER CHOICES	RESPONSES
Yes	50.00% 8
No	25.00% 4
I don't know	25.00% 4
TOTAL	16

#	PLEASE EXPLAIN	DATE
1	Even though we have back up generators, water, and emergency/disaster plans, things happen!	8/27/2020 12:05 PM
2	Older communities may not have the generator power required to support equipment and needs.	8/24/2020 10:07 AM
3	I believe that newer facilities are built disaster resistant. Some older facilities need to strategically plan for upgrades.	8/23/2020 6:24 PM
4	I would expect hospitals have back up power but i don't know about schools, nursing homes, or other facilities. Fire is always a potential disaster as well and we saw that this year in an assisted living facility in Chester County.	8/19/2020 8:34 PM
5	Unknown. Our facility is, but I can't speak for others.	8/19/2020 5:12 PM

Q7 Looking at the facilities owned/operated by your organization, are there any facilities that DO NOT have backup power generation capabilities?

Answered: 16 Skipped: 0

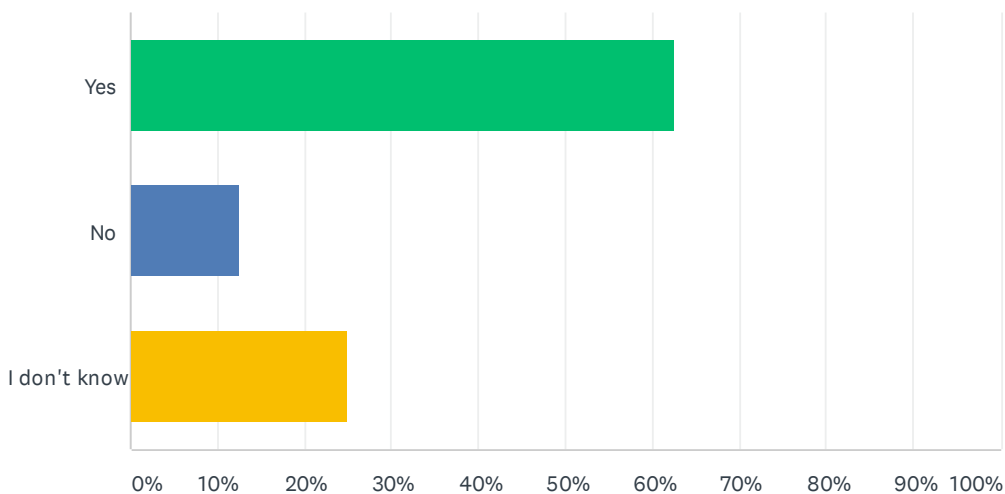


ANSWER CHOICES	RESPONSES
Yes	18.75% 3
No	68.75% 11
I don't know	12.50% 2
TOTAL	16

#	IF THERE ARE FACILITIES WITHOUT BACKUP POWER, PLEASE PROVIDE THE NAME AND LOCATION OF THE BUILDING.	DATE
1	Cartmel and Coniston - located off Rts. 926 and 52; near our main campus	8/27/2020 12:05 PM
2	156 Leary Road, Honey Brook, Pa., 50 Wilmington Road Coatesville, Pa.,411 Bonsall School Road Coatesville, Pa.	8/25/2020 5:59 AM
3	Our Spring City outpatient clinic does not have back up power but we are in the process of installing.	8/19/2020 8:34 PM

Q8 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazard events?

Answered: 16 Skipped: 0

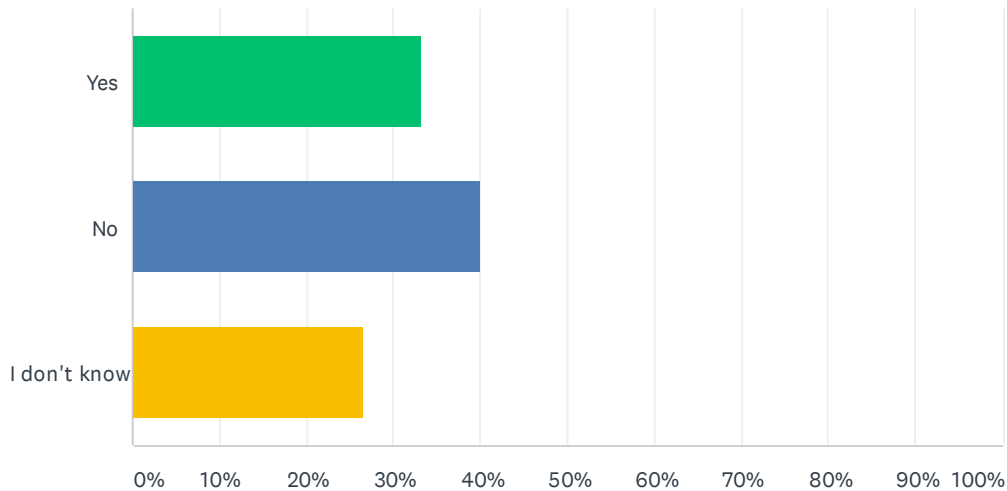


ANSWER CHOICES	RESPONSES
Yes	62.50% 10
No	12.50% 2
I don't know	25.00% 4
TOTAL	16

#	PLEASE EXPLAIN	DATE
1	but we could always look for some more secondary roads due to the vast amount of woods/trees on the campus and near our main roadways.	8/27/2020 12:05 PM
2	with some warning - yes	8/20/2020 10:58 AM
3	Flooding and large downed trees in roads surrounding the community have limited staff from getting to work. Large volumes of water running down E. Conestoga Rd, under the train bridge into our parking lot causing flooding, cause parking issues for residents and guests.	8/20/2020 9:20 AM
4	we have entrances on 2 different roads	8/19/2020 6:09 PM
5	Our main entrances are subject to flooding as are areas on Park Avenue and Beaver Dam/Birdell.	8/19/2020 5:12 PM

Q9 Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster-resistant to support your facility's health care functions during and after hazard events?

Answered: 15 Skipped: 1

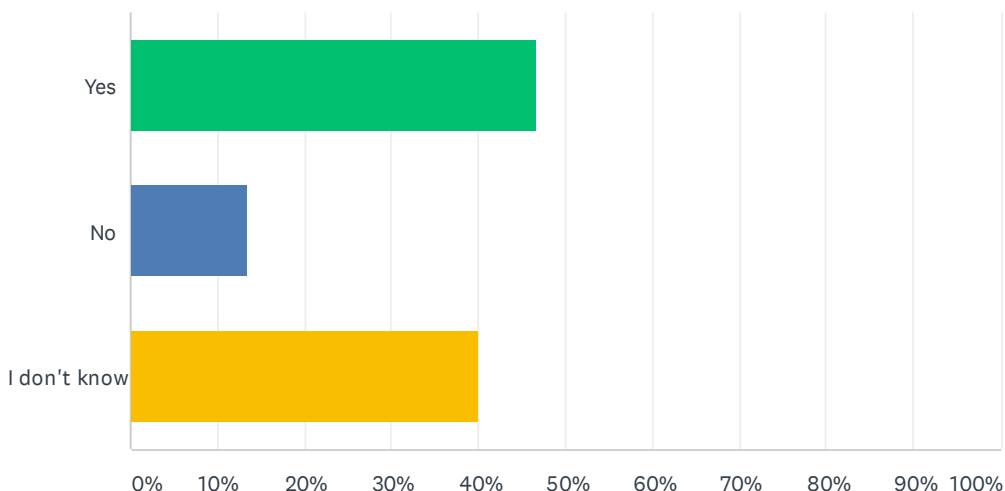


ANSWER CHOICES	RESPONSES	
Yes	33.33%	5
No	40.00%	6
I don't know	26.67%	4
TOTAL		15

#	PLEASE EXPLAIN	DATE
1	we've lost phone communications, internet in past	8/27/2020 12:10 PM
2	it took a few days to restore power to our facility our generator worked fine provided power for all functions but I believe that we shouldn't rely on a back up for so long	8/20/2020 1:48 PM
3	Electricity loss at patient's homes is an issue for Medical Equipment, etc.	8/20/2020 11:01 AM
4	Major rains cause debris to wash down E. Conestoga Rd into our drainage systems, backing them up and causing flooding of one of our exits and parking lot	8/20/2020 9:23 AM
5	We experience frequent power outages	8/20/2020 7:11 AM
6	we will be installing a new full house generator in the next 2 weeks. this will back up the entire building.	8/19/2020 6:13 PM
7	We have power from two directions, two internet carriers, but it doesn't take to much to put us in a bind.	8/19/2020 5:16 PM
8	Not coming from this area, I am surprised at the power outages that occur after storms.	8/19/2020 4:57 PM

Q10 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to disasters, so as not to increase the need for health care services during hazard events?

Answered: 15 Skipped: 1

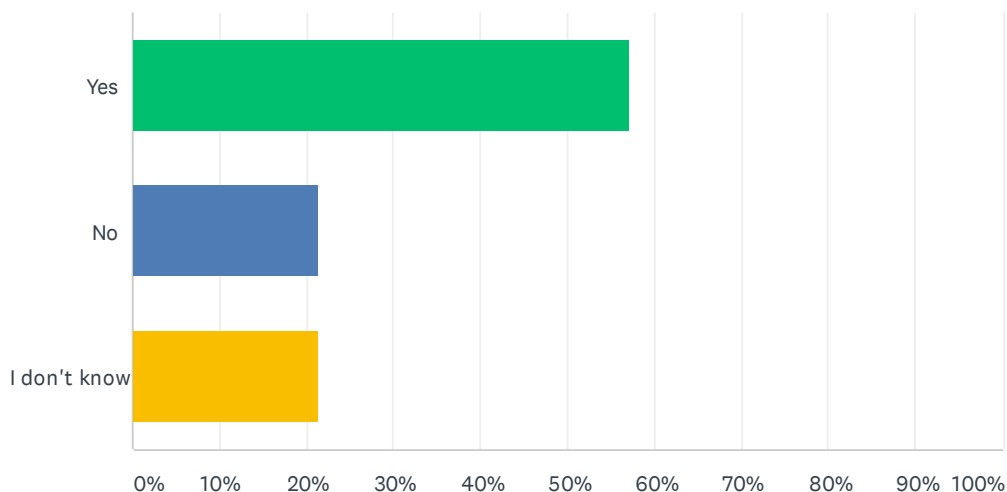


ANSWER CHOICES	RESPONSES
Yes	46.67% 7
No	13.33% 2
I don't know	40.00% 6
TOTAL	15

#	PLEASE EXPLAIN	DATE
1	I am not a resident of County, only work in the County	8/31/2020 6:47 AM
2	I am not aware of any public education on this topic	8/23/2020 6:32 PM
3	I do think there is some public education available but not sure all age groups are able to access it.	8/19/2020 8:40 PM
4	i do not currently receive any information to know if this is true or not. sara.thompson3@genesishcc.com	8/19/2020 6:13 PM
5	The literature and training are great - not sure that the public avails itself of the opportunities.	8/19/2020 5:16 PM

Q11 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support hospital functions during hazard events?

Answered: 14 Skipped: 2

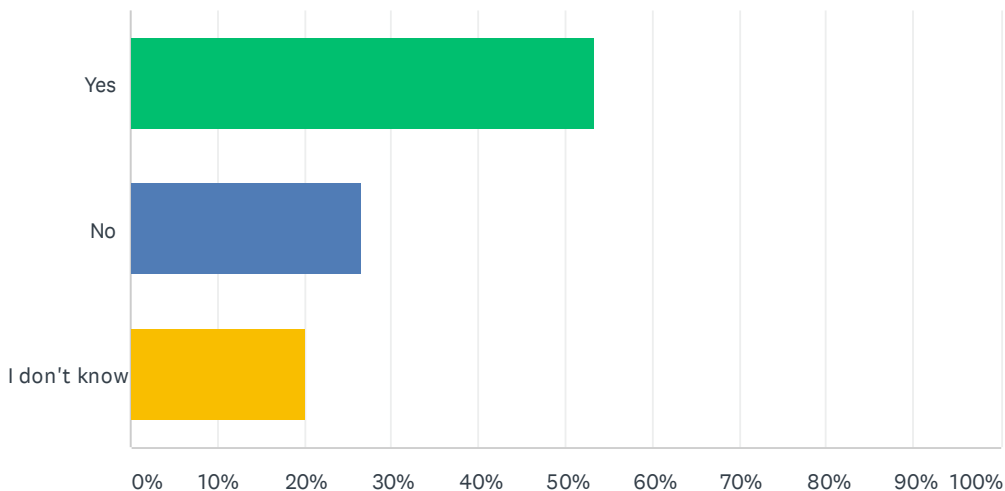


ANSWER CHOICES	RESPONSES
Yes	57.14% 8
No	21.43% 3
I don't know	21.43% 3
TOTAL	14

#	PLEASE EXPLAIN	DATE
1	I am linked into the CHESCO system very helpful	8/31/2020 6:47 AM
2	We get the Chester County email alerts that are good....perhaps a "robo" call may help too.	8/27/2020 12:10 PM
3	I have appreciated the Chester County communication emails during the pandemic. I would imagine that the same process would be utilized in this type of situation.	8/24/2020 10:13 AM
4	staff have a very difficult time getting to work post storms when trees or bridges are affected. Medical staff are vital and I believe we need to assist them in getting to work.	8/20/2020 1:48 PM
5	Helpful. All staff use WAZE also to navigate road closures.	8/20/2020 11:01 AM
6	i have not received any information to know	8/19/2020 6:13 PM
7	I may not know how to access these.	8/19/2020 5:16 PM

Q12 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, PERS, audible alerts, cell and text services, Alert PA, CodeRED)?

Answered: 15 Skipped: 1

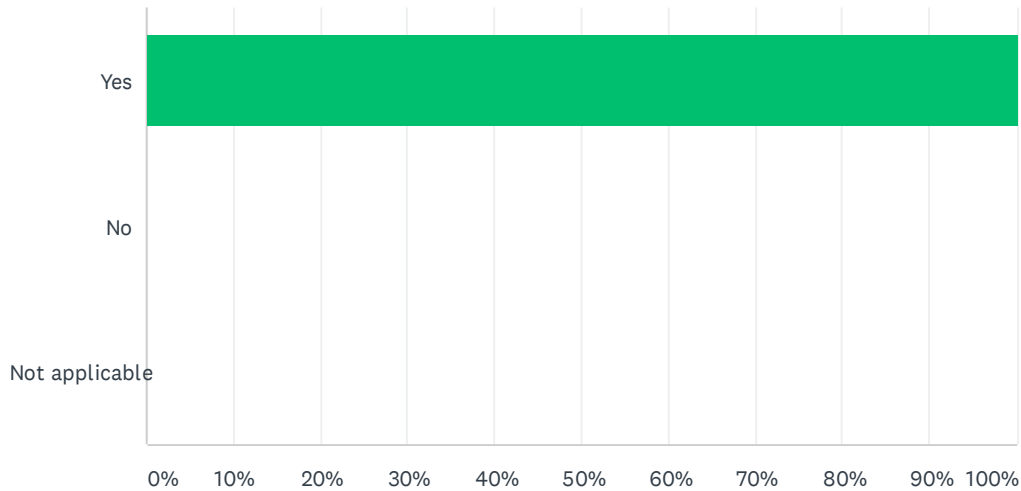


ANSWER CHOICES	RESPONSES	
Yes	53.33%	8
No	26.67%	4
I don't know	20.00%	3
TOTAL		15

#	PLEASE EXPLAIN	DATE
1	We are as providers, but more education and marketing of those systems is always best practice.	8/27/2020 12:10 PM
2	I believe that the use of emergency warning and notification systems is increasing, especially with the widespread use of cell phone and of dedicated alert systems.	8/23/2020 6:32 PM
3	The alert services are not widely known in the community	8/20/2020 7:11 AM

Q13 Do you think that your organization works to inform employees, medical professionals, residents, and patients of how they can better manage their risk to hazard events?

Answered: 15 Skipped: 1

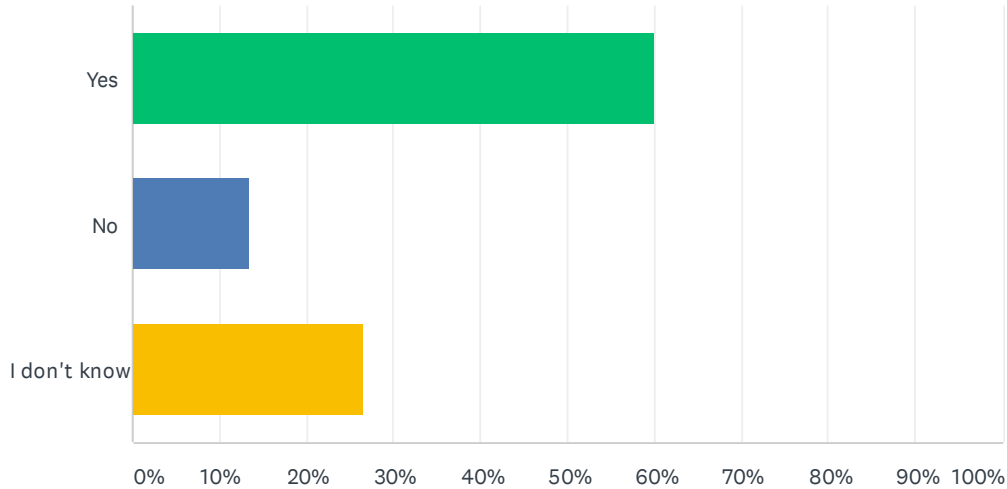


ANSWER CHOICES	RESPONSES	
Yes	100.00%	15
No	0.00%	0
Not applicable	0.00%	0
TOTAL		15

#	PLEASE EXPLAIN	DATE
1	However doing off hours and weekends needs improvement as minimal staff on campus and oncall staff reside atleast 30 mins - 1 hour from campus	8/31/2020 6:47 AM
2	We have begun an alert system and we are expanding our efforts in this regard	8/23/2020 6:32 PM

Q14 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to disasters in your community?

Answered: 15 Skipped: 1

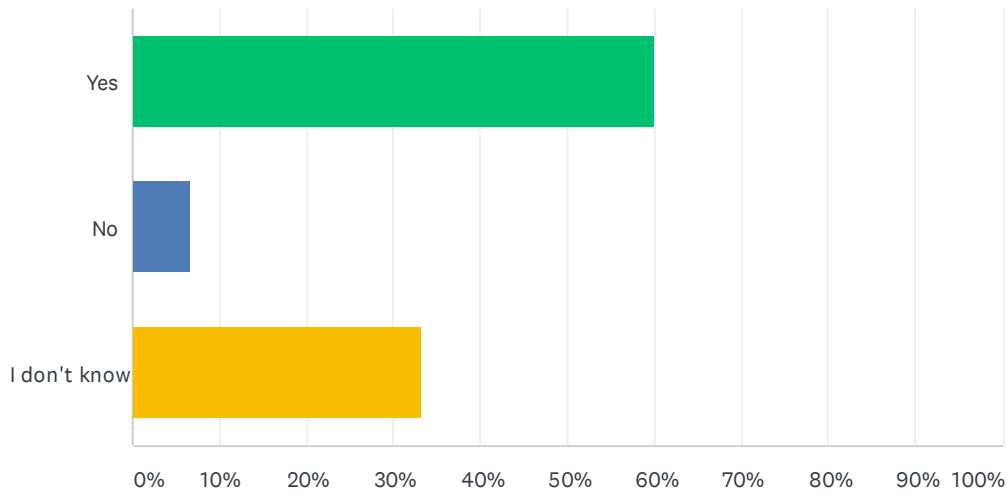


ANSWER CHOICES	RESPONSES
Yes	60.00% 9
No	13.33% 2
I don't know	26.67% 4
TOTAL	15

#	PLEASE EXPLAIN	DATE
1	We can always improve. Our Emergency Preparedness Committee meets regularly to prepare for these types of matters.	8/27/2020 12:10 PM
2	I believe that Chester County has made great efforts to draw its population into disaster preparedness.	8/23/2020 6:32 PM
3	I think we did not respond well to the COVID need in the nursing home community and assisted living community which led to lack of PPE and oxygen concentrators for this group. Better planning and sharing of resources was needed.	8/19/2020 8:40 PM
4	i would like more information on this topic from Chester county	8/19/2020 6:13 PM
5	Depending on the nature of the disaster, things can go south quickly.	8/19/2020 5:16 PM

Q15 Do you think that local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

Answered: 15 Skipped: 1

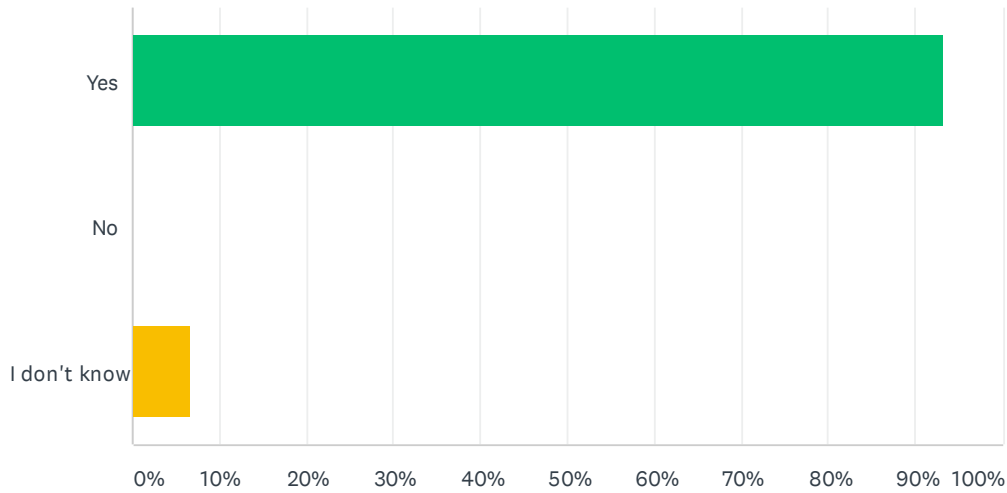


ANSWER CHOICES	RESPONSES
Yes	60.00% 9
No	6.67% 1
I don't know	33.33% 5
TOTAL	15

#	PLEASE EXPLAIN	DATE
1	Better planning for flu pandemic was needed.	8/19/2020 8:40 PM

Q16 Does your organization maintain a Business Continuity Plan?

Answered: 15 Skipped: 1

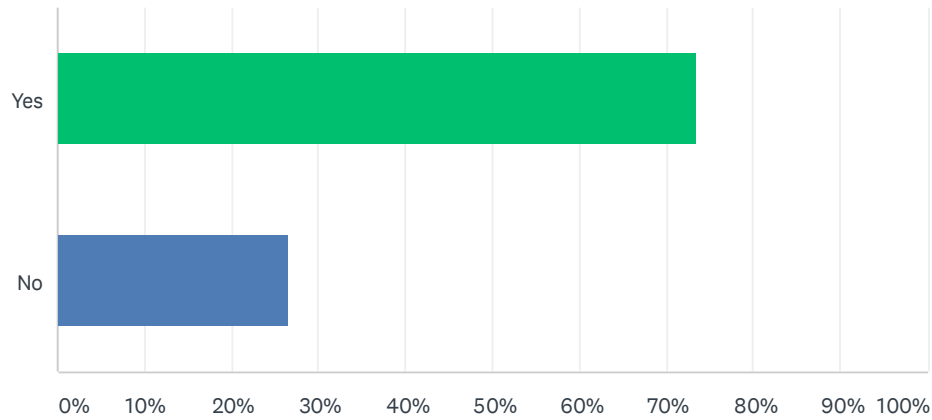


ANSWER CHOICES	RESPONSES
Yes	93.33% 14
No	0.00% 0
I don't know	6.67% 1
TOTAL	15

#	IF "YES", PLEASE EXPLAIN.	DATE
1	We have an emergency/disaster plan....we're a 24/7 operation; we don't call it "Business Continuity"	8/27/2020 12:10 PM
2	We have elements of a business continuing plan. Our delivery of essential medical services - pharmacy, electronic health record, etc - are cloud based. We have an evacuation plan in place. Certainly more needs to be done.	8/23/2020 6:32 PM
3	we have transfer plans with facilities in other areas	8/20/2020 1:48 PM
4	Our EOP is submitted and approved by CC	8/20/2020 11:01 AM
5	we have plans in place to continue business if a disaster or outage occurs	8/19/2020 6:13 PM

Q17 Is your organization aware of the Southeast Healthcare Coalition?

Answered: 15 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	73.33%	11
No	26.67%	4
TOTAL		15

#	IF YES, DOES YOUR ORGANIZATION PARTICIPATE?	DATE
1	Yes	8/27/2020 12:10 PM
2	I am not personally aware; our safety director may be aware.	8/23/2020 6:32 PM
3	yes	8/20/2020 11:01 AM
4	yes	8/19/2020 8:40 PM
5	yes	8/19/2020 6:13 PM
6	Yes, I chair the Chester County LTC Zone.	8/19/2020 5:16 PM
7	Yes	8/19/2020 4:57 PM

Q18 Can you identify projects or programs that you have implemented to reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 14 Skipped: 2

#	RESPONSES	DATE
1	None, been Administrator x3 mnths	8/31/2020 6:51 AM
2	Increased focus on disaster planning and drills, ie. recent drill with CC for tornado; COVID 19 pandemic plan	8/27/2020 12:12 PM
3	Generator were purchased for 2 of the homes.	8/25/2020 10:41 AM
4	We have emergency water and food supplies on hand. We also submit our Emergency plan/changes to our emergency plan, to the county annually.	8/24/2020 10:14 AM
5	Our cloud based EHR - Point Click Care and our cloud based Pharmacy software. We have upgrade coverage of business operation with expansion of our generator power availability.	8/23/2020 6:35 PM
6	monthly drills annual training	8/20/2020 1:50 PM
7	Disaster Drills	8/20/2020 1:12 PM
8	Transfer plans for vulnerable patients	8/20/2020 11:03 AM
9	We have an emergency management plan that is followed	8/20/2020 9:25 AM
10	Revised emergency codes and organized incident assessment teams	8/20/2020 7:13 AM
11	We have installed back up generators, stockpile PPE, maintain a review of trees on property, and have a fire department on premises in Coatesville	8/19/2020 8:41 PM
12	full house generator being installed in 2 weeks	8/19/2020 6:14 PM
13	Yes, we go through assessments after every interruption so that we can be better prepared the next time it occurs.	8/19/2020 5:19 PM
14	We have an emergency plan that provides interventions and courses of action for a multitude of events	8/19/2020 4:58 PM

Q19 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 9 Skipped: 7

#	RESPONSES	DATE
1	No, will need to discuss with our campus Director of Facilities and Construction. We did recently install new fire panel but this was because the one prior required total replacement.	8/31/2020 6:51 AM
2	Looking to educate residents and staff on active shooter/violence/intruders	8/27/2020 12:12 PM
3	The purchase of generators for all 11 homes	8/25/2020 10:41 AM
4	We do have a back up generator on campus.	8/24/2020 10:14 AM
5	Preparation before weather events, etc.	8/20/2020 11:03 AM
6	Our emergency management plan	8/20/2020 9:25 AM
7	full house generator	8/19/2020 6:14 PM
8	Multiple generators. All major services - power, water and sewer are covered.	8/19/2020 5:19 PM
9	No	8/19/2020 4:58 PM

Q20 Do you have any other comments, questions, or concerns?

Answered: 3 Skipped: 13

#	RESPONSES	DATE
1	I need to educate/inform myself of campus program/projects so I can better equipped for this vulnerabilities that we may experience community wide - reading our disaster/emergency plan is not the total angle	8/31/2020 6:51 AM
2	no	8/20/2020 11:03 AM
3	No	8/19/2020 4:58 PM

Q21 Name of respondent:

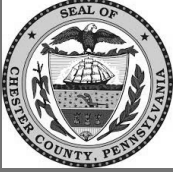
Answered: 14 Skipped: 2

#	RESPONSES	DATE
1	Deborah Reinbold	8/31/2020 6:51 AM
2	Donna Taylor	8/27/2020 12:12 PM
3	Kim Marshall	8/25/2020 10:41 AM
4	ken Hook	8/25/2020 9:05 AM
5	Tracey Aungst	8/24/2020 10:14 AM
6	Sister Anne Veronica Burrows, IHM	8/23/2020 6:35 PM
7	Josh Aron	8/20/2020 1:50 PM
8	Nicole Del-Mese, RN DON	8/20/2020 1:12 PM
9	Marjorie Thomas	8/20/2020 11:03 AM
10	Stve Johnson	8/20/2020 7:13 AM
11	Nancy Schmid	8/19/2020 8:41 PM
12	Sara Thompson	8/19/2020 6:14 PM
13	Bruce Hartshorne	8/19/2020 5:19 PM
14	Deb Bodnar	8/19/2020 4:58 PM

Q22 Contact information (email address or phone number) - optional:

Answered: 10 Skipped: 6

#	RESPONSES	DATE
1	dreinbold@jennerspond.org	8/31/2020 6:51 AM
2	donna.taylor@kal.kendal.org	8/27/2020 12:12 PM
3	JAron@PhoenixCenterHC.com	8/20/2020 1:50 PM
4	Nicole_Del-Mese@LCCA.com	8/20/2020 1:12 PM
5	marjoriethomas@holisticarehospice.org	8/20/2020 11:03 AM
6	steven.johnson@towerhealth.org	8/20/2020 7:13 AM
7	Nancy.schmid@va.gov	8/19/2020 8:41 PM
8	sara.thompson3@genesishcc.com	8/19/2020 6:14 PM
9	bhartshorne@telhai.org	8/19/2020 5:19 PM
10	executivedirector@woodbridgeplace.com	8/19/2020 4:58 PM



Chester County Multi-Jurisdictional Hazard Mitigation Plan - Citizen Survey

1. Introduction

Chester County Residents,

A planning committee, along with the support of county, regional and state agencies and stakeholders, has recently been formed to address natural disasters that may occur in Chester County and develop strategies to mitigate against losses. In order to identify and plan for future natural disasters, we need assistance from the citizens of Chester County.

This questionnaire is designed to help us gauge the level of knowledge local citizens already have about natural disaster issues. Our questionnaire also asks for information you may have about areas vulnerable to any type of natural disaster. The information you provide will help us coordinate activities to reduce the risk of injury or property damage in the future.

You will be asked if you live in a floodplain. If you do not know, or are not sure, please check the FEMA website: <https://msc.fema.gov/portal/home>.

This survey will take approximately 15 minutes to complete.

Thank you for taking the time to participate in this information-gathering process!



Chester County Multi-Jurisdictional Hazard Mitigation Plan - Citizen Survey

2. Natural Hazard Information

In this section, we are looking for your input on the types of hazards that impact Chester County and its residents. Please answer the following questions to help us understand the concerns throughout the County.

1. In the past 5 years, which of the following types of hazards/natural disasters have you experienced within Chester County, or sustained damage as a result of, and how concerned are you about the following natural hazards impacting the County? (In the first column indicate if you have experienced the hazard, then indicate your level of concern).

	Have Experienced	Not Concerned	Somewhat Concerned	Very Concerned	Extremely Concerned
Climate Change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expansive Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Temperatures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flooding - Street/Property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flooding - Basement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flooding - 1st Floor or above	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hurricane/Tropical Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Infestation and Invasive Species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landslide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nor'easter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sea-Level Rise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Severe Storm (wind, lightning, hail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Severe Winter Storms (Blizzard, Heavy Snow, Ice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tornado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tsunami	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildfire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, indicate in comment box below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify)

6. Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (e.g. reverse 911, audible alerts, etc.)?

- Yes
 No
 I don't know

Please explain

7. Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to disasters?

- Yes
 No
 I don't know

Other (please explain)

8. Which of the following steps has your household taken to prepare for a hazard event? Check all that apply.

- | | |
|--|--|
| <input type="checkbox"/> Made an emergency plan | <input type="checkbox"/> Stored battery-operated radio |
| <input type="checkbox"/> Designated a meeting place | <input type="checkbox"/> Stored fire extinguisher |
| <input type="checkbox"/> Identified utility shutoffs | <input type="checkbox"/> Registered to receive emergency alerts |
| <input type="checkbox"/> Received first aid/CPR training | <input type="checkbox"/> Stored medical supplies |
| <input type="checkbox"/> Prepared a disaster supply kit | <input type="checkbox"/> Purchased additional insurance to cover losses (e.g. flood insurance) |
| <input type="checkbox"/> Installed smoke detectors on each level of home | <input type="checkbox"/> Received emergency preparedness information from a government source |
| <input type="checkbox"/> Stored food and water | <input type="checkbox"/> Identified the location of the nearest emergency shelter |
| <input type="checkbox"/> Stored flashlights and batteries | |

Other (please specify)

9. In the past, has your home been damaged by a hazard event? For example, the basement of your home flooded and damaged the hot water heater.

- Yes
 No

If yes, please explain the damage your structure sustained and when it occurred.

10. If you answered 'yes' above, did you report the damages to your local police, fire, or emergency management departments?

Yes

No

If you answered 'no', why did you not report the damages?

11. To the best of your knowledge is your property located in a designated floodplain?

If you do not know, or are not sure, please check the FEMA website: <https://msc.fema.gov/portal/home>.

Yes No Not Sure

12. If your property is in the floodplain, do you have flood insurance?

Yes No

13. If your property is located outside of the floodplain, do you have flood insurance?

Yes

No

14. If you do NOT have flood insurance, what is the primary reason?

I don't need it

My property has never flooded

It is too expensive

Not familiar with it/don't know about it

Insurance company will not provide

I believe that my homeowners insurance will cover me

My property is located on high ground

Other (please specify)

15. Do you or did you have problems getting homeowners/renters insurance due to risks from natural hazards?

Yes No

If you answered "yes", please identify the natural hazard risk that caused you to have problems obtaining homeowners/renters insurance.



3. Hazard Mitigation

As defined by FEMA, mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. In order for mitigation to be effective, we need to take action now - before the next disaster - to reduce human and financial consequences later.

Effective mitigation requires that we all understand local risks, address the hard choices, and invest in long-term community well-being. Without mitigation actions, we jeopardize our safety, financial security and self-reliance.

In this section of the survey, we want to hear from you how Chester County can help mitigate the county and become more resilient before the next storm strikes.

16. Please identify any specific vulnerabilities that you are aware of *in your city/town/village* (e.g. floodprone areas or specific properties, critical facilities that lack backup power, etc.). Please list street names and other specific identifiers if possible.

17. Please identify any specific vulnerabilities that you are aware of *in Chester County outside of your city/town/village* (e.g. floodprone areas or specific properties, critical facilities that lack backup power, etc.). Please list city/town/village, street names, and other specific identifiers if possible.

18. What types of projects do you believe local, county, state or federal government agencies could be doing in order to reduce the damage and disruption of natural disasters in Chester County? Select your top three choices.

- | | |
|---|---|
| <input type="checkbox"/> Improve and strengthen critical facilities such as police, schools, hospitals | <input type="checkbox"/> Strengthen codes, ordinances and plans to require higher hazard risk management standards and/or provide greater control over development in high hazard areas |
| <input type="checkbox"/> Improve and strengthen infrastructure, such as elevating roadways and improving drainage systems | <input type="checkbox"/> Buy out flood prone properties and maintain as open-space |
| <input type="checkbox"/> Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities etc.) | <input type="checkbox"/> Inform property owners of ways they can mitigate damage to their properties |
| <input type="checkbox"/> Install or improve protective structures, such as bulkheads, floodwalls or levees to protect against flooding | <input type="checkbox"/> Provide better information about hazard risks and high-hazard areas |
| <input type="checkbox"/> Enhance dune restoration and beach nourishment projects/programs | <input type="checkbox"/> Assist vulnerable property owners with securing funding to mitigate their properties |
| <input type="checkbox"/> Replace inadequate or vulnerable bridges and causeways | |

Other (please specify)

19. Do you feel your municipality is doing enough towards reducing hazard risks, climate adaptation, or other mitigation/prevention measures?

- Yes
- No
- I don't know

Please provide details for your answer.

20. If your property were located in a designated high-hazard area (for example, NFIP flood zone) or had received repeated damages from a natural disaster event, would you consider any of the following options?

If your response is dependent on certain factors, such as the funding source, please indicate those factors in the following question.

	Yes	No	Unsure		
Having your property bought out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moving your structure to another property or a less risky part of your property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elevating your structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floodproof your structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Look into other ways to mitigate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

21. Please select the factor(s) that would influence your decision on the mitigation options listed above (buyout/acquisition, relocation, or elevation).

- Cost
- Do not have the means to move/relocate
- Unaware of available programs
- Length of process
- Other (please specify)

22. If you have already spent money to mitigate your home, how much did you spend and on what measures?

23. Which (if any) incentives would motivate you to spend money to protect your home from the possible impacts of a disaster?

24. Please list any additional types of projects you believe local, county, state or federal government agencies could be doing to reduce the damage and disruption in Chester County.

25. Do you have any other comments, questions or concerns regarding hazard mitigation in Chester County?



Chester County Multi-Jurisdictional Hazard Mitigation Plan - Citizen Survey

4. General Household Information

The answers provided in this section will be treated as CONFIDENTIAL and will be used solely for the preparation of this plan.

26. Please indicate in which municipality you live.

- | | | |
|--|--|--|
| <input type="radio"/> Coatesville (C) | <input type="radio"/> East Marlborough (Twp) | <input type="radio"/> South Coventry (Twp) |
| <input type="radio"/> Atglen (B) | <input type="radio"/> East Nantmeal (Twp) | <input type="radio"/> Thornbury (Twp) |
| <input type="radio"/> Avondale (B) | <input type="radio"/> East Nottingham (Twp) | <input type="radio"/> Tredyffrin (Twp) |
| <input type="radio"/> Downingtown (B) | <input type="radio"/> East Pikeland (Twp) | <input type="radio"/> Upper Oxford (Twp) |
| <input type="radio"/> Elverson (B) | <input type="radio"/> East Vincent (Twp) | <input type="radio"/> Upper Uwchlan (Twp) |
| <input type="radio"/> Honey Brook (B) | <input type="radio"/> East Whiteland (Twp) | <input type="radio"/> Uwchlan (Twp) |
| <input type="radio"/> Kennett Square (B) | <input type="radio"/> Easttown (Twp) | <input type="radio"/> Valley (Twp) |
| <input type="radio"/> Malvern (B) | <input type="radio"/> Elk (Twp) | <input type="radio"/> Wallace (Twp) |
| <input type="radio"/> Modena (B) | <input type="radio"/> Franklin (Twp) | <input type="radio"/> Warwick (Twp) |
| <input type="radio"/> Oxford (B) | <input type="radio"/> Highland (Twp) | <input type="radio"/> West Bradford (Twp) |
| <input type="radio"/> Parkesburg (B) | <input type="radio"/> Honey Brook (Twp) | <input type="radio"/> West Brandywine (Twp) |
| <input type="radio"/> Phoenixville (B) | <input type="radio"/> Kennett (Twp) | <input type="radio"/> West Caln (Twp) |
| <input type="radio"/> South Coatesville (B) | <input type="radio"/> London Britain (Twp) | <input type="radio"/> West Fallowfield (Twp) |
| <input type="radio"/> Spring City (B) | <input type="radio"/> London Grove (Twp) | <input type="radio"/> West Goshen (Twp) |
| <input type="radio"/> West Chester (B) | <input type="radio"/> Londonderry (Twp) | <input type="radio"/> West Marlborough (Twp) |
| <input type="radio"/> West Grove (B) | <input type="radio"/> Lower Oxford (Twp) | <input type="radio"/> West Nantmeal (Twp) |
| <input type="radio"/> Birmingham (Twp) | <input type="radio"/> New Garden (Twp) | <input type="radio"/> West Nottingham (Twp) |
| <input type="radio"/> Caln (Twp) | <input type="radio"/> New London (Twp) | <input type="radio"/> West Pikeland (Twp) |
| <input type="radio"/> Charlestown (Twp) | <input type="radio"/> Newlin (Twp) | <input type="radio"/> West Sadsbury (Twp) |
| <input type="radio"/> East Bradford (Twp) | <input type="radio"/> North Coventry (Twp) | <input type="radio"/> West Vincent (Twp) |
| <input type="radio"/> East Brandywine (Twp) | <input type="radio"/> Penn (Twp) | <input type="radio"/> West Whiteland (Twp) |
| <input type="radio"/> East Caln (Twp) | <input type="radio"/> Pennsbury (Twp) | <input type="radio"/> Westtown (Twp) |
| <input type="radio"/> East Coventry (Twp) | <input type="radio"/> Pocopson (Twp) | <input type="radio"/> Willistown (Twp) |
| <input type="radio"/> East Fallowfield (Twp) | <input type="radio"/> Sadsbury (Twp) | |
| <input type="radio"/> East Goshen (Twp) | <input type="radio"/> Schuylkill (Twp) | |

27. How long have you lived here?

- | | |
|--|--|
| <input type="radio"/> Less than 1 year | <input type="radio"/> 10 to 19 years |
| <input type="radio"/> 1 to 5 years | <input type="radio"/> 20 years or more |
| <input type="radio"/> 6 to 9 years | |

28. Do you own or rent your place of residence?

Own Rent

29. What street is your property on? This is optional and will be kept confidential - only used to identify hazard areas such as flooding.

30. If you received real estate disclosure information when you moved into your current residence, did your real estate agent or landlord explain the implications of living in a hazard risk zone and did you understand the information they presented?

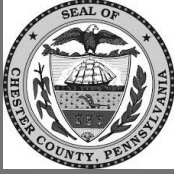
Yes

No

Other (please specify)

31. Please indicate your age range:

18 to 30 31 to 40 41 to 50 51 to 60 60 or over



Chester County Hazard Mitigation Plan Update - Public Works Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a “blueprint” by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Public Works Survey

Please answer the following questions about hazards and how they affect highway and public works departments in Chester County. Please provide as much information as possible. Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of your department:

2. What type of facilities do you maintain?

Buildings

Water/Sewer Plants

Roads

Stormwater Infrastructure

Bridges

Waterbodies

Other (please specify)

3. Please identify the services your department normally provides. Of these services, please identify which services you believe are essential services that must be provided prior to, during, and after a disaster in order to protect public safety and health.

4. Please identify the location of your facility(ies) and/or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is

county-wide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
| <input type="checkbox"/> Elverson (B) | <input type="checkbox"/> East Vincent (Twp) | <input type="checkbox"/> Upper Uwchlan (Twp) |
| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
| <input type="checkbox"/> Kennett Square (B) | <input type="checkbox"/> Easttown (Twp) | <input type="checkbox"/> Valley (Twp) |
| <input type="checkbox"/> Malvern (B) | <input type="checkbox"/> Elk (Twp) | <input type="checkbox"/> Wallace (Twp) |
| <input type="checkbox"/> Modena (B) | <input type="checkbox"/> Franklin (Twp) | <input type="checkbox"/> Warwick (Twp) |
| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
| <input type="checkbox"/> Parkesburg (B) | <input type="checkbox"/> Honey Brook (Twp) | <input type="checkbox"/> West Brandywine (Twp) |
| <input type="checkbox"/> Phoenixville (B) | <input type="checkbox"/> Kennett (Twp) | <input type="checkbox"/> West Caln (Twp) |
| <input type="checkbox"/> South Coatesville (B) | <input type="checkbox"/> London Britain (Twp) | <input type="checkbox"/> West Fallowfield (Twp) |
| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
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| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
| <input type="checkbox"/> East Caln (Twp) | <input type="checkbox"/> Pennsbury (Twp) | <input type="checkbox"/> Westtown (Twp) |
| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

5. Are any of your facilities located in known hazard areas (e.g. floodplain, wildfire, subsidence, etc.)?

- Yes
- No
- I don't know

If yes, identify the facilities and their location.

6. Looking back at previous hazard events, has your department, or the facilities you are responsible for (buildings, bridges, roads, etc.), been impacted by the event (damaged building, closed for long periods of time, etc.)?

- Yes
- No

7. If you answered "YES," please identify the events and provide a brief description of the damages or loss of service and quantify the number of roads, bridges, etc. that were out of service.



Chester County Hazard Mitigation Plan Update - Public Works Survey

8. Do you believe that your facilities are disaster resistant or capable of withstanding a disaster (e.g. properly located and constructed and have back-up power as appropriate)?

Yes

Don't Know

No

Please explain

9. Do you think that the transportation infrastructure in the county (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to natural hazards, providing long-term support for your community's response and recovery needs?

Yes

Don't Know

No

Please explain

10. Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster resistant to support your department's ability to maintain operations and support response or recovery efforts?

Yes

Don't Know

No

Please explain

11. Looking at the facilities your agency owns/operates, what facilities DO NOT have backup power generation capabilities?

12. Do you believe that hazard risks (e.g. flood zones, steep slopes, wildfire risk zones) are considered when local authorities consider land development and land use planning?

Yes

Don't Know

No

Please explain

13. Do you believe that private businesses (construction companies, equipment rental companies, building material supply companies, etc.) are a valuable resource in helping your department perform pre-disaster preparation and/or help in recovery post disaster?

Yes

Don't Know

No

Please explain

14. Does your department have a defined role or responsibility in an existing, adopted, or draft emergency response plan established for your local municipality?

Yes

Don't Know

No

Please explain

15. Do you think the local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

Yes

Don't Know

No

Please explain

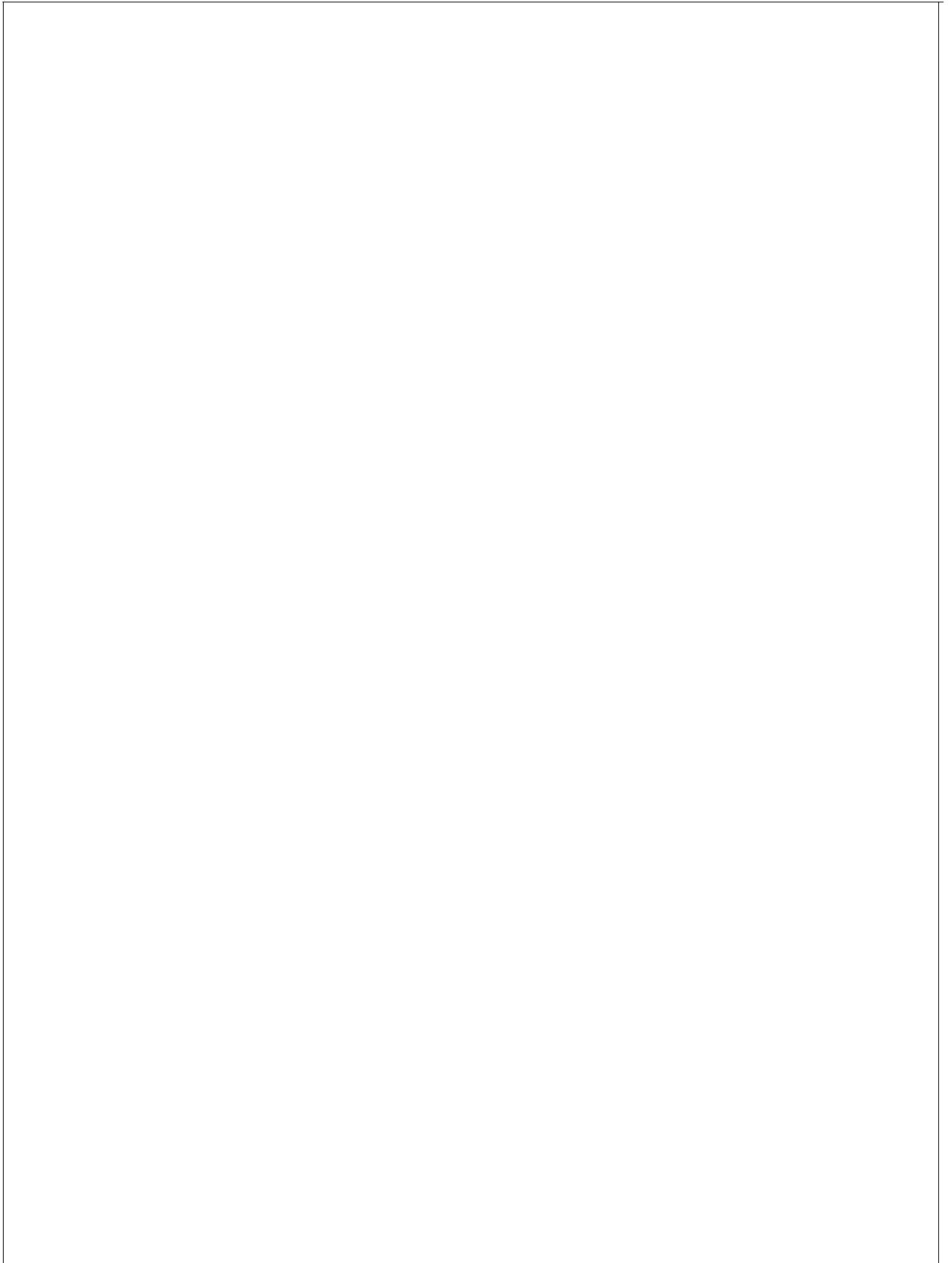
16. Is your department included within a Continuity of Operations / Continuity of Government (COOP / COG) plan? COOP / COG plans examine a department's ability to perform minimum essential functions during any situation. COOP activities support the continuance of essential functions, while COG activities support the continuance of local government.

Yes

Don't Know

No

Please explain





Chester County Hazard Mitigation Plan Update - Public Works Survey

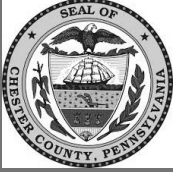
17. What areas in Chester County do you feel are the most vulnerable to hazards and need to be addressed?
Please include location and municipality.

18. Can you identify projects or programs that you have implemented to reduce your community's vulnerability to infrastructure (roads, public buildings, bridges, water/sewer plants, etc.) damage and losses, including loss of operation/service, to hazard events?

19. Can you identify projects or programs that you would like to implement to reduce your community's vulnerability to infrastructure (roads, public buildings, bridges, water/sewer plants, etc.) damage and losses, including loss of operation/service, to hazard events?

20. Do you have any other comments, questions, or concerns?

21. Name of Respondent



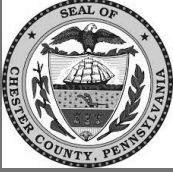
Chester County Hazard Mitigation Plan Update - Transportation Survey

Chester County, along with its city, townships and boroughs, are in the process of updating the Hazard Mitigation Plan (HMP). The following survey is designed to help identify general needs for hazard mitigation within Chester County pertaining to your organization or industry, and identify projects that may be helpful to address those needs.

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters (natural, technological, and manmade). These include flooding, severe storms, severe winter storms, etc. and others.

The Hazard Mitigation Plan provides a “blueprint” by which local governments can make coordinated efforts towards reducing losses from natural hazards. It is required by the Federal Emergency Management Agency (FEMA) in order to be eligible for federal grant funding for public and private mitigation projects.

More information about this planning process and additional mitigation resources may be found at the Chester County HMP website by going to: <https://www.chestercountypahmp.com/>



Chester County Hazard Mitigation Plan Update - Transportation Survey

Please answer the following questions about hazards and how they affect the transportation sector in Chester County. Please provide as much information as possible. Where possible, identify specific areas (locations, facilities, programs, etc.) that need to be improved in the County and provide suggestions for improvements. Please note that individual answers will not be published.

If there are other important issues that you feel are not covered by this survey, please let us know.

1. Name of your agency or department:

2. What type of facilities or infrastructure do you maintain?

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> Buildings | <input type="checkbox"/> Waterbodies |
| <input type="checkbox"/> Roads/Highways | <input type="checkbox"/> Railways |
| <input type="checkbox"/> Bridges | |
| <input type="checkbox"/> Other (please specify) | |

3. Please identify the services your agency or department normally provides. Of these services, please identify which services you believe are essential services that must be provided prior to, during, and after a disaster in order to protect public safety and health.

4. Please identify the location of your facility(ies) and/or primary service area. You may choose more than one if your service area covers multiple communities, or "Chester County (entire area)" if your service area is

county-wide:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chester County (entire area) | <input type="checkbox"/> East Goshen (Twp) | <input type="checkbox"/> Schuylkill (Twp) |
| <input type="checkbox"/> Coatesville (C) | <input type="checkbox"/> East Marlborough (Twp) | <input type="checkbox"/> South Coventry (Twp) |
| <input type="checkbox"/> Atglen (B) | <input type="checkbox"/> East Nantmeal (Twp) | <input type="checkbox"/> Thornbury (Twp) |
| <input type="checkbox"/> Avondale (B) | <input type="checkbox"/> East Nottingham (Twp) | <input type="checkbox"/> Tredyffrin (Twp) |
| <input type="checkbox"/> Downingtown (B) | <input type="checkbox"/> East Pikeland (Twp) | <input type="checkbox"/> Upper Oxford (Twp) |
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| <input type="checkbox"/> Honey Brook (B) | <input type="checkbox"/> East Whiteland (Twp) | <input type="checkbox"/> Uwchlan (Twp) |
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| <input type="checkbox"/> Oxford (B) | <input type="checkbox"/> Highland (Twp) | <input type="checkbox"/> West Bradford (Twp) |
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| <input type="checkbox"/> Spring City (B) | <input type="checkbox"/> London Grove (Twp) | <input type="checkbox"/> West Goshen (Twp) |
| <input type="checkbox"/> West Chester (B) | <input type="checkbox"/> Londonderry (Twp) | <input type="checkbox"/> West Marlborough (Twp) |
| <input type="checkbox"/> West Grove (B) | <input type="checkbox"/> Lower Oxford (Twp) | <input type="checkbox"/> West Nantmeal (Twp) |
| <input type="checkbox"/> Birmingham (Twp) | <input type="checkbox"/> New Garden (Twp) | <input type="checkbox"/> West Nottingham (Twp) |
| <input type="checkbox"/> Caln (Twp) | <input type="checkbox"/> New London (Twp) | <input type="checkbox"/> West Pikeland (Twp) |
| <input type="checkbox"/> Charlestown (Twp) | <input type="checkbox"/> Newlin (Twp) | <input type="checkbox"/> West Sadsbury (Twp) |
| <input type="checkbox"/> East Bradford (Twp) | <input type="checkbox"/> North Coventry (Twp) | <input type="checkbox"/> West Vincent (Twp) |
| <input type="checkbox"/> East Brandywine (Twp) | <input type="checkbox"/> Penn (Twp) | <input type="checkbox"/> West Whiteland (Twp) |
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| <input type="checkbox"/> East Coventry (Twp) | <input type="checkbox"/> Pocopson (Twp) | <input type="checkbox"/> Willistown (Twp) |
| <input type="checkbox"/> East Fallowfield (Twp) | <input type="checkbox"/> Sadsbury (Twp) | |
| <input type="checkbox"/> Other (please specify) | | |

5. Has your department/agency or the facilities you are responsible to maintain roads, bridges, etc.) been impacted by natural hazard events (damaged, closed for extended periods, etc.)?

Yes

No

If yes, please identify the events and provide a brief description of the damages or loss of service.

6. Are any of your transportation-related facilities or transportation routes located in known hazard areas (e.g. floodplain, wildfire, subsidence/sinkholes, etc.)?

Yes

No

I don't know

If yes, identify the facilities and their location.

7. Looking at the facilities your agency owns/operates, what facilities DO NOT have backup power generation capabilities?



Chester County Hazard Mitigation Plan Update - Transportation Survey

8. Do you believe that your transportation infrastructure is disaster resistant or capable of withstanding a disaster (e.g. properly located and constructed, backup power, etc.)?

Yes

Don't Know

No

Please explain

9. Do you think that the transportation operations and/or infrastructure in the county (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards, providing long-term support for your community's response and recovery needs?

Yes

Don't Know

No

Please explain

10. Do you think that the utility infrastructure (such as electricity, communications, water, and sewer) is sufficiently disaster resistant to support your agency/department's ability to maintain operations and support response or recovery efforts?

Yes

Don't Know

No

Please explain

11. Do you believe that hazard risks (e.g. flood zones, steep slopes, wildfire risk zones) are considered when local authorities consider land development and land use planning?

Yes

Don't Know

No

Please explain

12. Do you believe that private businesses (construction companies, equipment rental companies, building material supply companies, etc.) are a valuable resource in helping your agency/department perform pre-disaster preparation and/or help in recovery post disaster?

Yes

Don't Know

No

Please explain

13. Does your agency/department have a defined role or responsibility in an existing, adopted, or draft emergency response plan established for your local municipality?

Yes

Don't Know

No

Please explain

14. Do you think the local government understands, supports, and possesses the resources for hazard risk reduction efforts in the County?

Yes

Don't Know

No

Please explain

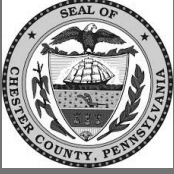
15. Is your agency/department included within a Continuity of Operations / Continuity of Government (COOP / COG) plan? COOP / COG plans examine an agency's or department's ability to perform minimum essential functions during any situation. COOP activities support the continuance of essential functions, while COG activities support the continuance of local government.

Yes

Don't Know

No

Please explain



Chester County Hazard Mitigation Plan Update - Transportation Survey

16. What areas in Chester County do you feel are the most vulnerable to hazards and need to be addressed?
Please include location and municipality.

17. Can you identify any projects or programs that have been implemented to reduce the vulnerability of transportation infrastructure (roads, bridges, etc.) or transportation operations to hazard events?

18. Can you identify projects or programs that you would like to implement to reduce the vulnerability of your transportation infrastructure (roads, bridges, etc.) or operations to hazard events?

19. Do you have any other comments, questions, or concerns?

20. Name of Respondent

Chester County PENNSYLVANIA Government A-Z Services Forms Explore Chester County Espanol

I'm Looking For...

Home / Government / Departments / Emergency Services / Chester County Multijurisdictional Hazard Mitigation

Chester County Multi-Jurisdictional Hazard Mitigation Plan

Hazard mitigation reduces loss of life and property by minimizing the impact of disasters. The process starts by identifying risks and vulnerabilities that are common in our area. After identifying these risks, a plan is developed for long-term strategies for protecting people and property from similar future events. These strategies include specific, actionable projects that can be infrastructure improvements or policy-related initiatives.

A Hazard Mitigation Plan then serves as a blue print of how to reduce risk and create safer, more disaster resilient communities within our County. Currently, the Chester County Multi-jurisdictional Hazard Mitigation (HMP) is in the process of being updated.

To read the current plan: <https://www.chesco.org/DocumentCenter/View/503592015-Hazard-Mitigation-Plan-FINAL-2019>

To learn more about the planning process and how it relates to Chester County, please visit the HMP website: <https://www.chestercountypa.org/>

The Hazard Mitigation Plan presents a coordinated plan which encompasses all of the municipalities within the county as well as Chester County itself. In order to fully understand the risks of a community, local government needs to hear from its citizens and stakeholders.

The Department of Emergency Services has developed a survey that community members can use to help us identify areas of recurring damage. Ultimately, this information will help local government identify projects that are eligible for federal mitigation grants.

Please take a moment and let us know what areas of your community, where you find damage recurring: <https://survey23.arcgis.com/survey/53a609753aa607459463489406063c>

For any questions or for more information, please contact Gabby Ratliff at gratliff@chesco.org

ReadyChesCo VolunteerChesCo Questions / Concerns Employment Directory of Care

Chester County PENNSYLVANIA Government A-Z Services Forms Explore Chester County Espanol

I'm Looking For...

Home / Government / Departments / Emergency Services

Emergency Services

NOTICE: Chester County is currently in the Commonwealth of Pennsylvania's "green phase" as a result of the COVID-19 pandemic. Due to the restrictions being upheld during the green phase, Chester County Government and Courts are providing limited services with many of our staff continuing to provide services and programs while working from home. If you are not able to complete your business online or find yourself in need of our services, please send us an email at enr-pa@chesco.org or call us on 610-344-6000.

We appreciate your patience and understanding during this time. Please continue to follow all CDC and PA Department of Health guidelines to help control the spread of COVID-19 during the green phase. A reminder of the guidelines to be followed during the green phase are found here: <https://health.chestercounty.org/reg/alerts.cfm>

Ashwood Apartment Residents

Please click on picture for more information

HURRICANE HAZARD RISK CLEANUP OUTLINE CALL 610-344-6000

READY ChesCo 610

Active incidents

Smart911.com

PulsePoint

CCRD COVID-19

First Responders

Clean/NCIC Forms and Information

Michael R. Jefferly Sr., Director
Government Services Center
801 Westmore Road, Suite 012
West Chester, PA 19380
Ph: 610-344-6000
Ft: 610-344-6000
emr@chesco.org

Public Safety Training Campus
123 Marina Road
Conewago, PA 19320
Ph: 610-344-4100
Ft: 610-344-6083
jeff@chesco.org

News

- Residents Help Halted on the Chester County Hazard Mitigation Plan update
- Planning Safety Day
- Things to Remember for Extreme Heat
- Heat Stroke Newsletter, June 2020
- Public Safety Day

ReadyChesCo VolunteerChesCo Questions / Concerns Employment Directory of Care



Home

Chester County Hazard Mitigation Plan (HMP) Website

Welcome to the Chester County, PA Hazard Mitigation Plan Website. This website provides project updates, resources, and links to hazard mitigation in support of the HMP update.

The goal of the project is to save lives and property through the reduction of hazard vulnerability for the entire county. During the course of this planning project, county and local leaders and the community will work in tandem to identify risks, assess capabilities, and formulate a strategy to reduce disaster vulnerability.

Public participation and feedback is a vital part of the hazard mitigation planning process. The Chester County Department of Emergency Services has developed an online tool for individuals to describe problem areas and damage caused by hazards. This online tool provides an opportunity for you to contribute to the Chester County HMP update.

PLEASE PROVIDE INFORMATION ABOUT PROBLEMS IN THE COUNTY BY CLICKING HERE

Keep checking back regularly for information on upcoming events, to take our public survey, and to review and comment on the draft plan. If you would like to get in touch with the project team, please email Tony Subbio, Tetra Tech's project manager, at tony.subbio@tetratech.com.

[Meeting Materials](#)

[Draft Documents for Review](#)

[Upcoming Meetings](#)

Where does damage occur in your community?

Let Chester County Department of Emergency Services know where historically there has been damage in your community.

This information will be used to help identify projects that may be eligible for mitigation grants to help reduce risk to your community.

Damage Type*

Flooding Road Damage Bridge Damage
 Culvert Damage Building Damage
 Other

Recurring Damage*

Has this location experienced damage multiple times?

Yes No

Description

Briefly describe the damage

Location*

Enter an address, intersection, or a description of the damage location.

Map

Appendix F - Adoption Resolutions - Placeholder

Mitigation Action Worksheet

Municipality(ies):	Action
Action Number:	
<i>Location (address, lat/long)</i>	
<i>Mitigation Technique Category</i>	
<i>Hazard(s) Addressed</i>	
<i>Priority (High, Medium, Low)</i>	
<i>Estimated Cost</i>	
<i>Potential Funding Streams</i>	
<i>Timeline</i>	
<i>Lead Agency/Department</i>	
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	As opportunities arise elevate, acquire properties within flood prone areas. In addition, wet and dry proof commercial structures if they cannot be elevated or acquired
Action Number:	
ChesterC-1	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Low	
Potential Funding Streams	
HMGP	
Timeline	
Short	
Lead Agency/Department	
Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Coordinate utilization of privately-owned digital billboards for emergency usages
Action Number:	
ChesterC-2	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	DES, Planning Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County, all municipalities	Create a website to assist landowners and municipalities to navigate FEMA resources
Action Number:	
ChesterC-3	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All hazards
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Develop a countywide Debris Management Plan
Action Number:	
ChesterC-4	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Tornado and Windstorms
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES, Health Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Develop a plan to stagger traffic during delays/early releases for schools, government, and private sector during a disaster
Action Number:	
ChesterC-5	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	DES, Planning Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County, all municipalities	Develop an outreach and awareness program to provide to municipalities, where residents and potential homeowners could access to identify any risks they might have to deal with
Action Number:	
ChesterC-6	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Develop and implement a model natural conservation ordinance for municipal adoption
Action Number:	
ChesterC-7	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Natural Systems Protection (NSP)	
Hazard(s) Addressed	
Flood Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Planning Department, Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Educate county residents on the NFIP following flood events
Action Number:	
ChesterC-8	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Staff Time	
Timeline	
Ongoing	
Lead Agency/Department	
DES CCWRA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Educate the public on all the hazards they face
Action Number:	
ChesterC-9	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	All Hazards
Priority (High, Medium, Low)	Medium
Estimated Cost	Low
Potential Funding Streams	Staff Time, Operating Budget
Timeline	Short
Lead Agency/Department	DES
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County, all municipalities	Encourage municipal Code Enforcement Officials to become trained in Floodplain Management and NFIP Programs
Action Number:	
ChesterC-10	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Encourage municipalities to adopt an ordinance outlining the process to implement a snow emergency declaration
Action Number:	
ChesterC-11	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	
Winter Storms	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Municipal Budgets	
Timeline	
Short	
Lead Agency/Department	
Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Encourage municipalities to require radon testing at the time sale of homes
Action Number:	
ChesterC-12	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Radon Exposure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Staff Time, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Encourage new development planning to include burying of utility cables
Action Number:	
ChesterC-13	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Staff Time, Operating Budget
<i>Timeline</i>	Ongoing
<i>Lead Agency/Department</i>	Municipalities, Planning Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Encourage upgrades and improvements to stormwater runoff capabilities when reconstructing roads
Action Number:	
ChesterC-14	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jams
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Ongoing
<i>Lead Agency/Department</i>	PennDOT, Municipalities, DES, CCWRA, Planning Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Enhance the household hazard waste program to reduce post-event hazardous debris
Action Number:	
ChesterC-15	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Environmental Hazards Hazardous Material Releases, Tornado and Windstorms	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
DES, Health Department, Solid Waste Authority	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Ensure that the county has a COOP/COG Plan and procedures in place for off-site hazmat releases that can affect the buildings.
Action Number:	
ChesterC-16	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	
Environmental Hazard Hazardous Material Releases	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Medium	
Potential Funding Streams	
SEPA RTF Funding	
Timeline	
Short	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
All departments	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County, all municipalities	Ensure that the municipal EMAs have COOP/COG plans
Action Number:	
ChesterC-17	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	All hazards
Priority (High, Medium, Low)	High
Estimated Cost	Medium
Potential Funding Streams	SEPA RTF Funding
Timeline	Short
Lead Agency/Department	DES
Support Agency(ies)/ Department(s)	All departments
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Identify snow emergency routes in all municipalities to increase clearing efforts and travel ability of residents
Action Number:	
ChesterC-18	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Winter Storms	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Staff Time, Operating Budget, HMGP	
Timeline	
Ongoing	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Improve storm drains throughout the county to handle snow melt
Action Number:	
ChesterC-19	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Winter Storms	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Municipal Budgets, State Budgets, HMGP	
Timeline	
Long	
Lead Agency/Department	
Municipalities, PennDOT	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Include flood mitigation recommendations and NFIP program information in public education materials prepared by the Department of Emergency Services for Chester County
Action Number:	
ChesterC-20	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jams
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Staff Time, County funding, Operating Budget
<i>Timeline</i>	Ongoing
<i>Lead Agency/Department</i>	Planning Department, DES, CCWRA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County, all municipalities	Increase cell coverage and telecommunications bandwidth in areas with poor coverage
Action Number:	
ChesterC-21	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Utility Interruption	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, PA DCED, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Increase mutual aid and interagency agreements to support preparedness, mitigation, and response activities in Chester County
Action Number:	
ChesterC-22	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Staff Time, Operating Budget
<i>Timeline</i>	Ongoing
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	Municipalities, Procurement
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Install back-up power sources for traffic signals (generator, battery, solar)
Action Number:	
ChesterC-23	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Transportation Accidents	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Agency Budgets, HMGP	
Timeline	
Short	
Lead Agency/Department	
DES, Municipalities, PennDOT	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Install roadway gates to close off flood-prone intersections/ roads during flood incidents and signage to warn motorists of the closed road
Action Number:	
ChesterC-24	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating Budget, HMGP	
Timeline	
Short	
Lead Agency/Department	
DES, Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Investigate the interaction of public agencies and camera data from private companies/citizens
Action Number:	
ChesterC-25	
Location (address, lat/long)	
	Chester County (multiple locations)
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Terrorist Attacks
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Low
Potential Funding Streams	
	Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Sheriff's Office, DA's Office, DES
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Plan for replenishment fuel for generators
Action Number:	
ChesterC-26	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	Utility Interruption
Priority (High, Medium, Low)	Medium
Estimated Cost	Low
Potential Funding Streams	Operating Budget
Timeline	Short
Lead Agency/Department	DES, Private Sector
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Plant bushes/other vegetation to stop drifting snow in known problem areas
Action Number:	
ChesterC-27	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Winter Storms	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Low	
Potential Funding Streams	
Municipal Budgets	
Timeline	
Short	
Lead Agency/Department	
Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Produce a map to be used for public outreach and education showing the relative frequency that county roads/bridges are subject to flooding.
Action Number:	
ChesterC-28	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Planning Department, DES, CCWRA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County, all municipalities	Provide education to the municipalities on flood gauges.
Action Number:	
ChesterC-29	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Provide education to the municipalities on resident evacuation processes and need
Action Number:	
ChesterC-30	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Staff Time, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Provide public education on traffic accident reduction
Action Number:	
ChesterC-31	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	Transportation Accidents
Priority (High, Medium, Low)	Low
Estimated Cost	Low
Potential Funding Streams	Staff Time, County Budget
Timeline	Ongoing
Lead Agency/Department	DES, Planning Department
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Provide public information on debris management
Action Number:	
ChesterC-32	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	Tornado and Windstorms
Priority (High, Medium, Low)	Medium
Estimated Cost	Low
Potential Funding Streams	Operating Budget
Timeline	Short
Lead Agency/Department	DES, Health Department, Planning Department
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Purchase backup generators for critical infrastructure/key resources
Action Number:	
ChesterC-33	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Agency Budgets, HMGP
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES, Private Sector
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Pursue local mitigation efforts to improve areas that are vulnerable to flooding including both repetitive and non-repetitive loss structures within floodplains
Action Number:	
ChesterC-34	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
HMGP, CDBG	
Timeline	
Ongoing	
Lead Agency/Department	
Municipalities	
Support Agency(ies)/ Department(s)	
Planning Department, CCWRA, Conservation District, DES	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Retrofit critical public facilities with safe rooms
Action Number:	
ChesterC-35	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	Tornado and Windstorms
Priority (High, Medium, Low)	Low
Estimated Cost	High
Potential Funding Streams	HMGP, Operating Budget
Timeline	Long
Lead Agency/Department	DES
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Study traffic control boxes that would be exposed to riverine or stormwater flooding to determine if they are able to withstand the water
Action Number:	
ChesterC-36	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Transportation Accident	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
HMGP, Operating Budget	
Timeline	
Long	
Lead Agency/Department	
DES, Planning Department	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Sustain tree management programs around power lines
Action Number:	
ChesterC-37	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	Utility Interruption
Priority (High, Medium, Low)	High
Estimated Cost	Medium
Potential Funding Streams	Staff Time, Agency Budget
Timeline	Ongoing
Lead Agency/Department	Municipalities, private sector
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County, all municipalities	The county and all municipalities will work with their major businesses to ensure they have continuity plans in place.
Action Number:	
ChesterC-38	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	All departments
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):		Action
Chester County; Birmingham (T), Charlestown (T), Coatesville (C), Downingtown (B), East Bradford (T), East Brandywine (T), East Caln (T), East Coventry (T), East Fallowfield (T), East Goshen (T), East Marlborough (T), East Nantmeal (T), East Whiteland (T)		The county and all municipalities with a dam will work with dam operators to ensure they are protected to the 0.2% annual chance flood level.
Action Number:		
ChesterC-39		
Location (address, lat/long)		Chester County (multiple locations)
Mitigation Technique Category		Structure and infrastructure Project (SIP)
Hazard(s) Addressed		Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)		Medium
Estimated Cost		High
Potential Funding Streams		Operating Budget
Timeline		Long
Lead Agency/Department		DPW
Support Agency(ies)/ Department(s)		Dam Operators
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, East Brandywine Township, East Whiteland Township, Schuylkill Township, Thornbury Township, West Chester Borough, West Goshen Township, West Whiteland Township		The county and municipalities will work with the higher education facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.
Action Number:		
ChesterC-40		
Location (address, lat/long)		
Chester County (multiple locations)		
Mitigation Technique Category		
Local Plans and Regulations (LPR)		
Hazard(s) Addressed		
Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident		
Priority (High, Medium, Low)		
Medium		
Estimated Cost		
High		
Potential Funding Streams		
Operating Budget		
Timeline		
Short		
Lead Agency/Department		
County DES		
Support Agency(ies)/ Department(s)		
Municipal EMC		
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, Easttown Township, West Whiteland Township		The county and municipalities will work with the intermediate care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.
Action Number:		
ChesterC-41		
Location (address, lat/long)		
		Chester County (multiple locations)
Mitigation Technique Category		
		Local Plans and Regulations (LPR)
Hazard(s) Addressed		
		Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines
Priority (High, Medium, Low)		
		Medium
Estimated Cost		
		High
Potential Funding Streams		
		Operating Budget
Timeline		
		Short
Lead Agency/Department		
		County DES
Support Agency(ies)/ Department(s)		
		Municipal EMC
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, Caln Township, East Bradford Township, East Caln Township, East Coventry Township, East Goshen Township, East Pikeland Township, East Vincent Township, East Whiteland Township, Easttown Township, Honey Brook Township, Kennett Township		The county and municipalities will work with the long term care facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.
Action Number:		
ChesterC-42		
Location (address, lat/long)		Chester County (multiple locations)
Mitigation Technique Category		Local Plans and Regulations (LPR)
Hazard(s) Addressed		Dam Failure, Environmental Hazard Hazardous Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident
Priority (High, Medium, Low)		Medium
Estimated Cost		High
Potential Funding Streams		Operating Budget
Timeline		Short
Lead Agency/Department		County DES
Support Agency(ies)/ Department(s)		FPA, Municipal EMC
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, Coatesville City, East Vincent Township, Honey Brook Borough, Oxford Borough, Schuylkill Township, Uwchlan township, West Chester Borough		The county and municipalities will work with the senior living facility operators to discuss the hazards they face and ensure their emergency plans address those hazards.
Action Number:		
ChesterC-43		
Location (address, lat/long)		
Chester County (multiple locations)		
Mitigation Technique Category		
Local Plans and Regulations (LPR)		
Hazard(s) Addressed		
Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines, Nuclear Incident		
Priority (High, Medium, Low)		
Medium		
Estimated Cost		
High		
Potential Funding Streams		
Operating Budget		
Timeline		
Short		
Lead Agency/Department		
County DES		
Support Agency(ies)/ Department(s)		
Municipal EMC		
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):	Action
Chester County	The county will assess their bridges to determine what measures can be taken to protect them to the 0.2% annual chance flood level.
Action Number:	
ChesterC-44	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jams, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	Municipal EMCs, PEMA
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):		Action
Chester County, Birmingham Township, Caln Township, Charlestown Township, Coatesville City, Downingtown Borough, East Bradford Township, East Brandywine Township, East Caln Township, East Coventry Township, East Fallowfield Township, East Goshen Township		The county will work with all municipalities that have a child care facility exposed to any of the hazards to work with the child care facility operators to discuss hazards they face and ensure their emergency plans address those hazards
Action Number:		
ChesterC-45		
Location (address, lat/long)		
Chester County (multiple locations)		
Mitigation Technique Category		
Local Plans and Regulations (LPR)		
Hazard(s) Addressed		
Dam Failure, Environmental Hazards- Hazmat Release, Environmental Hazards-Pipeline, Flood, Flash Flood, and Ice Jams, Nuclear Incident		
Priority (High, Medium, Low)		
Medium		
Estimated Cost		
High		
Potential Funding Streams		
Operating Budget		
Timeline		
Short		
Lead Agency/Department		
County DES		
Support Agency(ies)/ Department(s)		
FPA, Municipal EMC		
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):	Action
Chester County, all municipalities	Update countywide Model Stormwater Ordinance
Action Number:	
ChesterC-46	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	When provided by FEMA, evaluate and apply FEMA non-regulatory electronic floodplain mapping and mitigation tools, where appropriate
Action Number:	
ChesterC-47	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Flood, Flash Flood , and Ice Jams	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
DES, CCWRA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):		Action
Chester County, Coatesville City, East Caln Township, East Goshen Township, Honey Brook Borough, New Garden Township, Oxford Borough, Parkesburg Borough, Phoenixville Borough, South Coventry Township, Tredyffrin Township, Uwchlan Township, Valley Township		Work with district courts to ensure they have plans in place for off-site hazmat releases that can affect the courts.
Action Number:		
ChesterC-48		
Location (address, lat/long)		Chester County (multiple locations)
Mitigation Technique Category		Local Plans and Regulations (LPR)
Hazard(s) Addressed		Environmental Hazard Hazardous Material Releases
Priority (High, Medium, Low)		High
Estimated Cost		Low
Potential Funding Streams		Operating Budget, Act 165 funds
Timeline		Short
Lead Agency/Department		DES
Support Agency(ies)/ Department(s)		District courts
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):	Action
Chester County, all municipalities	Work with hazmat facilities to inform them of the hazards they face and ensure emergency plans are current.
Action Number:	
ChesterC-49	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Environmental Hazard Hazardous Material Releases	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget, Act 165 funds	
Timeline	
Short	
Lead Agency/Department	
DES	
Support Agency(ies)/ Department(s)	
LEPC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):		Action
Chester County, Caln Township, Downingtown Borough, Penn Township, Phoenixville Borough, West Chester Borough, Willistown Township		Work with hospitals to ensure they have plans in place for off-site hazmat releases that can affect hospitals.
Action Number:		
ChesterC-50		
Location (address, lat/long)		
Chester County (multiple locations)		
Mitigation Technique Category		
Local Plans and Regulations (LPR)		
Hazard(s) Addressed		
Environmental Hazard Hazardous Material Releases		
Priority (High, Medium, Low)		
High		
Estimated Cost		
Low		
Potential Funding Streams		
Operating Budget, Act 165 funds		
Timeline		
Short		
Lead Agency/Department		
DES		
Support Agency(ies)/ Department(s)		
Hospitals		
Project Point of Contact		
<i>Name</i>		
<i>Title</i>		
<i>Agency/Department</i>		
<i>Phone</i>		
<i>E-mail</i>		



Municipality(ies):	Action
Chester County	Work with schools and school districts to inform them of the hazards they face and ensure emergency plans are current.
Action Number:	
ChesterC-51	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	
Environmental Hazard Hazardous Material Releases, Environmental Hazard Gas and Liquid Pipelines	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget, Act 165 funds	
Timeline	
Short	
Lead Agency/Department	
County DES	
Support Agency(ies)/ Department(s)	
Municipal EMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Chester County	Work with the municipalities to develop a map of the stormwater system, including intakes and outflows
Action Number:	
ChesterC-52	
Location (address, lat/long)	
Chester County (multiple locations)	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
CCWRA, Planning Department, DES, Municipalities	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Chester County	Work with the railroad industry to address safety concerns and aging rail infrastructure
Action Number:	
ChesterC-53	
<i>Location (address, lat/long)</i>	Chester County (multiple locations)
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget, PHMSA
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	DES, Planning Department
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):		Action
Chester County, East Brandywine Township, Modena Borough, Pocopson Township, Wallace Township		Work with the USPS on options for protecting the post offices from flooding and possible inundation from dam failure.
Action Number:		
ChesterC-54		
Location (address, lat/long)		
		Chester County (multiple locations)
Mitigation Technique Category		
		Structure and infrastructure Project (SIP)
Hazard(s) Addressed		
		Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)		
		High
Estimated Cost		
		Medium
Potential Funding Streams		
		Operating Budget, Act 165 funds
Timeline		
		Short
Lead Agency/Department		
		DPW
Support Agency(ies)/ Department(s)		
		USPS; Municipal FPA
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, Downingtown Borough, East Coventry Township, Wallace Township, West Whiteland Township		Work with Verizon to protect the facilities from flood or dam failure.
Action Number:		
ChesterC-55		
Location (address, lat/long)		
		Chester County (multiple locations)
Mitigation Technique Category		
		Structure and infrastructure Project (SIP)
Hazard(s) Addressed		
		Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)		
		Medium
Estimated Cost		
		Medium
Potential Funding Streams		
		FEMA HMGP, BRIC; Operating Budget
Timeline		
		Short
Lead Agency/Department		
		DES
Support Agency(ies)/ Department(s)		
		DPW, Municipal EMC, PEMA
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):		Action
Chester County, All Municipalities		Educate the public about resources available to combat the opioid abuse/addiction.
Action Number:		
ChesterC-56		
<i>Location (address, lat/long)</i>	N/A	
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)	
<i>Hazard(s) Addressed</i>	Opioid Addiction Response	
<i>Priority (High, Medium, Low)</i>	Medium	
<i>Estimated Cost</i>	Low	
<i>Potential Funding Streams</i>	Operating Budget	
<i>Timeline</i>	Short	
<i>Lead Agency/Department</i>	Chester County Health Department	
<i>Support Agency(ies)/ Department(s)</i>	DES	
Project Point of Contact		
<i>Name</i>		
<i>Title</i>		
<i>Agency/Department</i>		
<i>Phone</i>		
<i>E-mail</i>		



Municipality(ies):		Action
Chester County, All Municipalities		Improve telecommunications infrastructure, including accessibility of high-speed Internet connectivity, throughout the county
Action Number:		
ChesterC-57		
Location (address, lat/long)		
Chester County (multiple locations)		
Mitigation Technique Category		
Structure and Infrastructure Project (SIP)		
Hazard(s) Addressed		
Pandemic and Infectious Disease; Utility Interruption		
Priority (High, Medium, Low)		
High		
Estimated Cost		
High		
Potential Funding Streams		
PA DCED; Operating Budget		
Timeline		
Long		
Lead Agency/Department		
Chester County Planning Commission		
Support Agency(ies)/ Department(s)		
Project Point of Contact		
Name		
Title		
Agency/Department		
Phone		
E-mail		



Municipality(ies):	Action
Atglen Borough	The municipal FPA will work with the Atglen Borough Sewer Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
AtglenB-1	
<i>Location (address, lat/long)</i>	485 Main St
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Atglen Borough	Work with the property owner to determine what flood protection measures can be taken to protect the structure to the 0.2% annual chance flood level.
Action Number:	
AtglenB-2	
<i>Location (address, lat/long)</i>	SR 7401
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Avondale Borough	The municipal FPA will work with the Avondale Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
AvondaleB-1	
Location (address, lat/long)	
	128 W State St.
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Birmingham Township	Build an access road to Masters Way to Webb Rd
Action Number:	
BirminghamT-1	
Location (address, lat/long)	
	Masters Way to Webb Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Medium
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC; Operating Budget
Timeline	Short
Lead Agency/Department	Birmingham Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Birmingham Township	Work with PennDOT to reengineer intersection at Street Road (PA 926) bridge over Brandywine Creek
Action Number:	
BirminghamT-2	
Location (address, lat/long)	
PA 926 over Brandywine Creek	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
High	
Potential Funding Streams	
PennDOT, Municipal Budget	
Timeline	
Long	
Lead Agency/Department	
Birmingham Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Birmingham Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Brinton's Mill, Lenape Bridge, and Painter, Joseph, Farm
Action Number:	
BirminghamT-3	
Location (address, lat/long)	
Birmingham Township multiple locations	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
FPA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Caln Township	Acquire/Elevate the building located on 135 Seltzer Road
Action Number:	
CalnT-1	
Location (address, lat/long)	
	135 Seltzer Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Caln Township	Caln Township has major businesses that are vulnerable to dam failure and will work with management to protect the buildings.
Action Number:	
CalnT-2	
<i>Location (address, lat/long)</i>	Caln Township, multiple locations
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC
<i>Support Agency(ies)/ Department(s)</i>	Major businesses
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Caln Township	Protect the Caln Radio Tower to the 0.2% annual chance flood level and from a potential dam failure.
Action Number:	
CalnT-3	
Location (address, lat/long)	
	251 Wallace Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Caln Township	Work with Downingtown Middle School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.
Action Number:	
CalnT-4	
Location (address, lat/long)	
	115 Rock Raymond Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/Department(s)	
	Downingtown Middle School
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Charlestown Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pennsylvania Railroad Bridge (No.205), Pickering Dam
Action Number:	
CharlestownT-1	
<i>Location (address, lat/long)</i>	Charlestown Township, multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
City of Coatesville	Emergency Alert System - the City of Coatesville will implement an emergency alert system that will inform residents in the event of an emergency in an effort to improve public safety.
Action Number:	
CoatesvilleC-1	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Capital Improvement Budget; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	City of Coatesville Office of Emergency Management
<i>Support Agency(ies)/ Department(s)</i>	Coatesville Fire & Police Departments
Project Point of Contact	
<i>Name</i>	James Logan
<i>Title</i>	City Manager
<i>Agency/Department</i>	City of Coatesville
<i>Phone</i>	(610) 384-0300
<i>E-mail</i>	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Install gates to be closed during flood incidents and signage at 11th Avenue and railroad underpass
Action Number:	
CoatesvilleC-2	
Location (address, lat/long)	
	11th Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	City of Coatesville
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
City of Coatesville	West End Fire Station Generator - obtain a backup generator in order ensure that emergency operations are maintained during a power outage.
Action Number:	
CoatesvilleC-3	
Location (address, lat/long)	
134 Strobe Avenue, Coatesville, PA 19320	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Tornado, Windstorm; Utility Interruption; Winter Storm	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC; Capital Improvement Budget; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
City of Coatesville Office of Emergency Management	
Support Agency(ies)/ Department(s)	
West End Fire Company	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Protect ArcelorMital Emergency Services to the 0.2% annual chance flood level.
Action Number:	
Coatesville C-4	
Location (address, lat/long)	
	17 Rolling Mills Dr
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	FPA
Support Agency(ies)/Department(s)	
	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
City of Coatesville	Gibbons Run Culvert Flooding and Structural Stability – evaluate the culverts and repair, rehabilitate, or replace them as necessary.
Action Number:	
Coatesville C-5	
Location (address, lat/long)	
	East of the West Branch of the Brandywine Creek to the eastern City Limits.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA BRIC, HMGP; PA DCED FMP, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)
Timeline	
	Long
Lead Agency/Department	
	City of Coatesville Public Works Department
Support Agency(ies)/ Department(s)	
	Chester County Conservation District, Pennsylvania Department of Environmental Protection
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	The municipal FPA will work with the Martin-Brower facility owner/operator to protect the facility to the 0.2% annual chance flood level and dam failure.
Action Number:	
Coatesville C-6	
<i>Location (address, lat/long)</i>	201 Waverly Blvd
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jams, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	FPA
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
City of Coatesville	Upgrade City Hall Command Center - These upgrades include upgrades to the existing generator to allow for increased functionality of City Hall, the Police Station and the Emergency Command Center during a power outage and upgrades to the communication uti
Action Number:	
Coatesville C-7	
Location (address, lat/long)	
1 City Hall Piace, Coatesville, PA	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Tornado, Windstorm; Utility Interruption; Winter Storm	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
City of Coatesville	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: High Bridge, Huston, Abram, House & Carriage House, Lukens Main Office Building
Action Number:	
Coatesville C-8	
Location (address, lat/long)	
Coatesville City, multiple locations	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
City of Coatesville	Amtrak Keystone Corridor Underpass Flooding – evaluate and improve drainage and eroding areas along the corridor.
Action Number:	
Coatesville C-9	
Location (address, lat/long)	
	39.986015, -75.820679; N 3rd Avenue, between Coates Street & Fleetwood Street, Coatesville, PA 19320
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jams
Priority (High, Medium, Low)	High
Estimated Cost	High
Potential Funding Streams	FEMA BRIC, HMGP; PA DCED FMP, Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)
Timeline	Long
Lead Agency/Department	City of Coatesville Public Works Department
Support Agency(ies)/ Department(s)	Amtrak, Chester County Conservation District, Pennsylvania Department of Environmental Protection
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	S. 5th Avenue Stormwater Improvements
Action Number:	
Coatesville C-10	
Location (address, lat/long)	
5th Avenue & Olive Street, Coatesville, PA 19320	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA BRIC, HMGP; PA DCED FMP, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	
Timeline	
Long	
Lead Agency/Department	
City of Coatesville Public Works Department	
Support Agency(ies)/Department(s)	
Chester County Conservation District, Pennsylvania Department of Environmental Protection	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	63 S. 5th Ave. Property Protection - protect the existing grocery store on the corner of Olive St. and S 5th Ave.
Action Number:	
Coatesville C-11	
Location (address, lat/long)	
	63 South 5th Avenue, Coatesville, PA 19320
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA BRIC, HMGP
Timeline	
	Short
Lead Agency/Department	
	City of Coatesville Public Works Department
Support Agency(ies)/ Department(s)	
	Chester County Conservation District, Pennsylvania Department of Environmental Protection
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Pre-Plan Emergency Access Routes
Action Number:	
Coatesville C-12	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	City of Coatesville Public Works Department
<i>Support Agency(ies)/ Department(s)</i>	Chester County DES
Project Point of Contact	
<i>Name</i>	James Logan
<i>Title</i>	City Manager
<i>Agency/Department</i>	City of Coatesville
<i>Phone</i>	(610) 384-0300
<i>E-mail</i>	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Ash Park Stormwater Improvements - improve infiltration and mitigate floodwaters that pose a threat for travelers during/after storm events.
Action Number:	
Coatesville C-13	
Location (address, lat/long)	
39.981398, -75.818189, Ash Park, Coatesville, PA 19320	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA BRIC, HMGP; PA DCED FMP, Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	
Timeline	
Long	
Lead Agency/Department	
City of Coatesville Public Works Department	
Support Agency(ies)/ Department(s)	
Chester County Conservation District, Pennsylvania Department of Environmental Protection	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Downtown Stormwater Improvements - upgrade Coatesville's existing stormwater infrastructure in the downtown business district
Action Number:	
Coatesville C-14	
Location (address, lat/long)	
	1st, 2nd, 3rd, 4th Avenues, Lumber, E. Chestnut, E. Diamond Streets, and Dr. Martin Luther King Jr. Blvd., City of Coatesville, PA 19320
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA BRIC, HMGP; PA DCED Water and Sewers Program, H2O PA; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)
Timeline	
	Long
Lead Agency/Department	
	City of Coatesville Public Works Department
Support Agency(ies)/ Department(s)	
	Chester County Conservation District, Pennsylvania Department of Environmental Protection
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Millview Basin - restore proper stormwater detention basin function with added water quality improvements
Action Number:	
Coatesville C-15	
Location (address, lat/long)	
39.987243, -75.834594, Millview Park, Coatesville, PA 19320	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA BRIC, HMGP; PA DCED FMP, H2O PA, WRPP; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP)	
Timeline	
Short	
Lead Agency/Department	
City of Coatesville Public Works Department	
Support Agency(ies)/ Department(s)	
Valley Township, Chester County Conservation District, Pennsylvania Department of Environmental Protection	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Public Information Programs - develop education packages, classes, meetings, programs, etc. with the goal of improving public knowledge of potential hazards within the City and how these hazards are dealt with.
Action Number:	
Coatesville C-16	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Education and Awareness Programs (EAP)	
Hazard(s) Addressed	All hazards
Priority (High, Medium, Low)	Medium
Estimated Cost	Medium
Potential Funding Streams	Operating Budget
Timeline	Short
Lead Agency/Department	City of Coatesville Office of Emergency Management
Support Agency(ies)/ Department(s)	Coatesville City Council
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Create a Capital Improvements Plan
Action Number:	
Coatesville C-17	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating Budget, Chester County Vision Partnership Program; PADCED Municipal Assistance Program	
Timeline	
Short	
Lead Agency/Department	
City of Coatesville Public Works Department	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Provide backup power at the City's traffic signals, including developing a plan for implementation and refueling.
Action Number:	
Coatesville C-18	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism; Transportation Accident; Utility Interruption; Winter Storms
Priority (High, Medium, Low)	Medium
Estimated Cost	Medium
Potential Funding Streams	Capital Improvement Budget; Operating Budget; PADOT ARLE; PADOT Green Light Go; PADCED Municipal Assistance Program
Timeline	Short
Lead Agency/Department	City of Coatesville Public Works Department
Support Agency(ies)/ Department(s)	Chester County Conservation District, Pennsylvania Department of Environmental Protection
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
City of Coatesville	Route 82 Slope Stability - ensure the stability of the slopes along the eastern side of Route 82 in order to maintain unimpeded direct access into and out of the City.
Action Number:	
Coatesville C-19	
Location (address, lat/long)	
39.998999, -75.820688	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Dam Failure; Earthquake; Environmental Hazards; Flood, Flash Flood, and Ice Jams; Hurricane, Tropical Storm; Nuclear Incidents; Terrorism; Transportation Accident; Utility Interruption; Winter Storms	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
PennDOT; FEMA BRIC, HMGP; Capital Improvement Budget; Operating Budget; Chester County DCD (CDBG, CRP).	
Timeline	
Short	
Lead Agency/Department	
City of Coatesville Public Works Department	
Support Agency(ies)/ Department(s)	
PennDOT, Valley Township, Chester County Conservation District, Pennsylvania Department of Environmental Protection	
Project Point of Contact	
Name	James Logan
Title	City Manager
Agency/Department	City of Coatesville
Phone	(610) 384-0300
E-mail	jlogan@Coatesville.org



Municipality(ies):	Action
Downingtown Borough	Determine the specific vulnerability of the Downingtown Borough Building to dam failure and determine appropriate mitigation measures.
Action Number:	
DowningtownB-1	
Location (address, lat/long)	
	4 W Lancaster Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Downingtown Borough
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Downingtown Borough has major businesses that are vulnerable to dam failure and will work with management to protect the buildings
Action Number:	
DowningtownB-2	
Location (address, lat/long)	
Downingtown Borough, multiple locations	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Dam Failure	
Priority (High, Medium, Low)	
High	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC	
Support Agency(ies)/ Department(s)	
Downingtown Borough	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Protect Alert FC Fire Station from dam failure.
Action Number:	
DowningtownB-3	
Location (address, lat/long)	
	122 W Pennsylvania Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Fire Station
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Protect Downingtown - Jefferson Ave Electrical Substation to the 0.2% annual chance flood level and from the vulnerability to dam failure.
Action Number:	
DowningtownB-4	
Location (address, lat/long)	
	120 Jefferson Ave
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Downingtown Borough	Protect Downingtown Boro PD from potential dam failure.
Action Number:	
DowningtownB-5	
Location (address, lat/long)	
	10 W Lancaster Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Police Department
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Protect Minquas Ambulance Fire Station from dam failure and determine appropriate mitigation measures.
Action Number:	
DowningtownB-6	
Location (address, lat/long)	
	141 Wallace Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Minquas Ambulance Fire Station
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Protect Minquas FC from potential dam failure.
Action Number:	
DowningtownB-7	
Location (address, lat/long)	
	141 Wallace Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Minquas FC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Protect the Downingtown Municipal Waste from dam failure.
Action Number:	
DowningtownB-8	
Location (address, lat/long)	
	90 Water Plant Way
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Downingtown Municipal Waste
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	The municipal FPA will work with AT&T Mobility Downingtown - USID53712 facility owner/operator to protect the facility from its vulnerability to dam failure.
Action Number:	
DowningtownB-9	
Location (address, lat/long)	
	201 Wallace Avenue
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	Facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtwn Borough	The Municipal FPA will work with the Downingtwn Municipal Water Authority owner/operator to the 0.2% annual chance flood level and from vulnerability to dam failure.
Action Number:	
DowningtwnB-10	
Location (address, lat/long)	
	100 Water lant Way
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jams, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA, EMC
Support Agency(ies)/ Department(s)	
	Downingtwn Municipal Water Authority owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	The municipal FPA will work with the Inland Flexo, LLC facility owner/operator to protect the facility from its vulnerability to dam failure.
Action Number:	
DowningtownB-11	
Location (address, lat/long)	
	520 Lincoln Avenue
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA, EMC
Support Agency(ies)/Department(s)	
	Inland Flexo, LLC owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	The municipal FPA will work with the Johnson Matthey AGT facility owner/operator to protect the facility from vulnerability to dam failure.
Action Number:	
DowningtownB-12	
Location (address, lat/long)	
	498 Acorn Lane
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA, EMC
Support Agency(ies)/Department(s)	
	Johnson Matthey AGT facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	The municipal FPA will work with the Verizon Downingtown CO owner/operator to protect the facility from vulnerability to dam failure.
Action Number:	
DowningtownB-13	
Location (address, lat/long)	
	201 Whiteland Ave
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA, EMC
Support Agency(ies)/Department(s)	
	Verizon Downingtown CO owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtwn Borough	The municipal FPA will work with the Victory Brewing Company, LLC owner/operator to protect the facility from vulnerability to dam failure.
Action Number:	
DowningtwnB-14	
Location (address, lat/long)	
	420 Acorn Lane
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	FPA, Municipal EMC
Support Agency(ies)/ Department(s)	
	Victory Brewing Company, LLC owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with Beaver Creek Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.
Action Number:	
DowningtownB-15	
Location (address, lat/long)	
	601 Pennsylvania Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Beaver Creek Elementary School
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Downingtown Borough	Work with Downingtown High School West to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtownB-16	
Location (address, lat/long)	
	445 Manor Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Downingtown High School West
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtwn Borough	Work with East Ward Elementary School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtwnB-17	
Location (address, lat/long)	
	435 Washington Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	East Ward Elementary School
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with Lori Petrie's Pre School to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtownB-18	
Location (address, lat/long)	
	121 Manor Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Preschool
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with Regina Luminis Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtownB-19	
Location (address, lat/long)	
	40 W Pennsylvania Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Regina Luminis Academy
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with SEPTA and Amtrak to protect the station from dam failure
Action Number:	
DowningtownB-20	
Location (address, lat/long)	
	159 Viaduct Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	SEPTA and Amtrak
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with St. Joseph School to determine specific vulnerability to dam failure and determine appropriate mitigation measures.
Action Number:	
DowningtownB-21	
Location (address, lat/long)	
	340 Manor Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	St. Joseph School
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Downingtown Borough	Work with STEM Academy to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtownB-22	
Location (address, lat/long)	
	335 Manor Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	STEM Academy
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with Step by Step Children's House to determine specific vulnerability to dam failure and determine appropriate mitigation actions.
Action Number:	
DowningtownB-23	
Location (address, lat/long)	
	122 W Pennsylvania Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Step by Step Children's House
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Downingtown Borough	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect the, to the 0.2% annual chance flood level and vulnerability to dam failure: Downingtown Log House, Hunt, Roger and Mill Complex
Action Number:	
DowningtownB-24	
Location (address, lat/long)	
Downingtown Borough, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Downingtown Borough	Work with the United States Marine Recruiting Office to protect the structure from the vulnerabilities of dam failure.
Action Number:	
DowningtownB-25	
Location (address, lat/long)	
	11- Wallace Ave
Mitigation Technique Category	
	Local Plans and Regulations (LPR)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Marine Recruiting Offices
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/elevation of structure at 414 Cottage Lane
Action Number:	
EastBradfordT-1	
<i>Location (address, lat/long)</i>	414 Cottage Lane
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/elevation of structure located at 402 Cottage Lane
Action Number:	
EastBradfordT-2	
Location (address, lat/long)	
	402 Cottage Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/elevation of structure located at 406 Cottage Lane
Action Number:	
EastBradfordT-3	
Location (address, lat/long)	
	406 Cottage Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Bradford Township	Acquisition/elevation of structure located at 418 Cottage Lane
Action Number:	
EastBradfordT-4	
Location (address, lat/long)	
	418 Cottage Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Bradford Township	Acquisition/Elevation of structure located at 502 River Bed Lane
Action Number:	
EastBradfordT-5	
Location (address, lat/long)	
	502 River Bend Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/Elevation of structure located at 530 River Bend Lane
Action Number:	
EastBradfordT-6	
Location (address, lat/long)	
	530 River Bend Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/Elevation of structure located at 550 River Bend Lane
Action Number:	
EastBradfordT-7	
Location (address, lat/long)	
	550 River Bend Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Acquisition/Elevation of structure located at 558 River Bend Lane
Action Number:	
EastBradfordT-8	
Location (address, lat/long)	
	558 River Bend Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Install battery back-up and/or generator hookup on traffic signal on South Bradford Avenue and West Nields Street
Action Number:	
EastBradfordT-9	
<i>Location (address, lat/long)</i>	South Bradford Ave & West Nields Street
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Bradford Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Install gates to be closed during flood incidents and signage on Allerton Road between North Creek Road and Lucky Hill Road
Action Number:	
EastBradfordT-10	
<i>Location (address, lat/long)</i>	Allerton Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Bradford Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Install gates to be closed during flood incidents and signage on North Creek Road between Jefferis Bridge Road and Hillsdale Road
Action Number:	
EastBradfordT-11	
Location (address, lat/long)	
	North Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Bradford Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Install gates to be closed during flood incidents and signage on South Creek Road between Cottage Lane and Withers Way
Action Number:	
EastBradfordT-12	
Location (address, lat/long)	
	South Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Bradford Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Install gates to be closed during flood incidents and signage on Valley Creek Road between Harmony Hill Road and Ravine Road
Action Number:	
EastBradfordT-13	
Location (address, lat/long)	
	Valley Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Bradford Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Municipal FPA to work with the Aqua Ingrams Mill Plant facility owner/operator to protect the facility from the vulnerabilities to dam failure.
Action Number:	
EastBradfordT-14	
Location (address, lat/long)	
	780 N Creek Rd
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Bradford Township	Property protection of structure located at 1010 Valley Creek Road
Action Number:	
EastBradfordT-15	
Location (address, lat/long)	
	1010 Valley Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Bradford Township	Protect East Bradford Electrical Substation from vulnerability to dam failure.
Action Number:	
EastBradfordT-16	
<i>Location (address, lat/long)</i>	950 Downingtown Park
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Protect Good Fellowship Ambulance (Sub-Station) from the vulnerabilities from dam failure.
Action Number:	
EastBradfordT-17	
Location (address, lat/long)	
	961 Downingtown Park
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Bradford Township	The municipal FPA to work with the PECO Bradford Substation facility owner/operator to protect the facility from vulnerabilities to dam failure.
Action Number:	
EastBradfordT-18	
<i>Location (address, lat/long)</i>	950 Downingtown Pike
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	PECO Bradford Substation facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Bradford Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cope's Bridge, East Bradford Historic District- HDA, Gibson's Covered Bridge, Hance, Joseph, House & Barn, Hannum, Col. John House, Jefferis Ford Bridge, Paradise Valley Historic District, Strode's Mill, Strode's Mill Historic District, and Taylor-Cope Historic District
Action Number:	
EastBradfordT-19	
Location (address, lat/long)	
East Bradford Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Acquire/elevate structure at 745 Creek Road
Action Number:	
EastBrandywineT-1	
Location (address, lat/long)	
	745 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Brandywine Township	Acquire/elevate structure at 755 Creek Road
Action Number:	
EastBrandywineT-2	
Location (address, lat/long)	
	755 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Acquire/elevate structure at 765 Creek Road
Action Number:	
EastBrandywineT-3	
Location (address, lat/long)	
	765 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Brandywine Township	Acquire/elevate structure at 775 Creek Road
Action Number:	
EastBrandywineT-4	
<i>Location (address, lat/long)</i>	775 Creek Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Brandywine Township	Acquire/elevate structure at 785 Creek Road
Action Number:	
EastBrandywineT-5	
<i>Location (address, lat/long)</i>	785 Creek Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Brandywine Township	Beaver Creek Dam Rehabilitation Project
Action Number:	
EastBrandywineT-6	
Location (address, lat/long)	
	Beaver Creek Dam
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Dam Failure
Priority (High, Medium, Low)	High
Estimated Cost	High
Potential Funding Streams	USDA Natural Resources Conservation Service and Chester County Commissioners
Timeline	Short
Lead Agency/Department	Chester County Water Resources Authority
Support Agency(ies)/ Department(s)	USDA Natural Resources Conservation Service
Project Point of Contact	
Name	Craig Thomas
Title	Field Engineering and Operations Manager
Agency/Department	Chester County Water Resources Authority
Phone	610-344-5400
E-mail	cthomas@chesco.org



Municipality(ies):	Action
East Brandywine Township	Increase size of culvert crossing at 2069 Bondsville Road
Action Number:	
EastBrandywineT-7	
Location (address, lat/long)	
	2069 Bondsville Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	East Brandywine Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Install a flood wall protecting homes along Brandywine Creek from flooding along Creek Road at Crawford Road
Action Number:	
EastBrandywineT-8	
Location (address, lat/long)	
	Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Brandywine Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Install generator connection at East Brandywine Baptist Church
Action Number:	
EastBrandywineT-9	
Location (address, lat/long)	
999 Horseshoe Pike	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
All Hazards	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
East Brandywine Township/Public Works	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Install generator connection at Hopewell United Methodist Church
Action Number:	
EastBrandywineT-10	
Location (address, lat/long)	
	852 Hopewell Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	All Hazards
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Brandywine Township/Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Property protection of structure located at 1051 Creek Road
Action Number:	
EastBrandywineT-11	
Location (address, lat/long)	
	1051 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Property protection of structure located at 1061 Creek Road
Action Number:	
EastBrandywineT-12	
Location (address, lat/long)	
	1061 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Brandywine Township	Property protection of structure located at 1081 Creek Road
Action Number:	
EastBrandywineT-13	
Location (address, lat/long)	
	1081 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Brandywine Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Bridge Mill Farm, Dowlin Farm, and Marshall's Bridge
Action Number:	
EastBrandywineT-14	
Location (address, lat/long)	
East Brandywine Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jams, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Caln Township	Determine the specific vulnerability to dam failure and determine appropriate mitigation measures for the Downingtown Sewer Authority
Action Number:	
EastCalnT-1	
Location (address, lat/long)	
	550 Brandywine Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Caln Township	The municipal FPA to work with the D.R.W.P.C.C facility owner/operator to protect the facility from vulnerabilities to flooding.
Action Number:	
EastCalnT-2	
<i>Location (address, lat/long)</i>	550 Brandywine Ave
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA, EMC
<i>Support Agency(ies)/ Department(s)</i>	D.R.W.P.C.C facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Coventry Township	Acquisition/elevation of structure located at 285 Linfield Road
Action Number:	
EastCoventryT-1	
Location (address, lat/long)	
	285 Linfield Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Coventry Township	Install emergency alerting systems for East Coventry Township
Action Number:	
EastCoventryT-2	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	FEMA, PEMA, Regional and Local Grants and Municipal Funds
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Coventry Township/EMC
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Coventry Township	Project East Coventry - Linfield Road Electrical Substation from the vulnerabilities of dam failure.
Action Number:	
EastCoventryT-3	
Location (address, lat/long)	
	301 Linfield Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Coventry Township	The municipal FPA to work with Taylor Industries Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure
Action Number:	
EastCoventryT-4	
Location (address, lat/long)	
	35 Anderson Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Taylor Industries Inc facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Coventry Township	Work with the property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.
Action Number:	
EastCoventryT-5	
<i>Location (address, lat/long)</i>	SR 7015
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Fallowfield Township	Improve drainage to reduce flooding along Mortonville Road including intersection of Mortonville Road and Sawmill Road
Action Number:	
EastFallowfieldT-1	
<i>Location (address, lat/long)</i>	Mortonville Rd and Sawmill Rd
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Fallowfield Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Fallowfield Township	Improve drainage to reduce flooding on Timacula Road
Action Number:	
EastFallowfieldT-2	
<i>Location (address, lat/long)</i>	Timacula Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Fallowfield Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Fallowfield Township	Protect East Fallowfield - Spring Dell Road Electrical Substation to the 0.2% annual chance flood event
Action Number:	
EastFallowfieldT-3	
<i>Location (address, lat/long)</i>	90 Spring Dell Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Fallowfield Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Strasburg Rd Bridge, Speakman No.2, and The Gorden Farm
Action Number:	
EastFallowfieldT-4	
Location (address, lat/long)	
East Fallowfield Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EM, FPA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Goshen Township	Work with the Goodwin Acres owner to determine what protection measures can be taken to protect them from vulnerabilities to dam failure.
Action Number:	
EastGoshenT-1	
Location (address, lat/long)	
	600 Reservoir Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Goodwin Acres owner
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Marlborough Township	Emergency alerting systems for East Marlborough Township
Action Number:	
EastMarlboroughT-1	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	All Hazards
Priority (High, Medium, Low)	Low
Estimated Cost	Low
Potential Funding Streams	FEMA, PEMA, Regional and Local Grants and Municipal Funds
Timeline	Short
Lead Agency/Department	East Marlborough Township/EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Pikeland Township	Conduct power assessment for critical infrastructure/key resources to determine emergency generator needs and coordinate information with the Army Corps of Engineers
Action Number:	
EastPikelandT-1	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Pikeland Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Pikeland Township	Monitor and manage reservoirs and stream flows to sustain water sources needed to meet public water supply needs
Action Number:	
EastPikelandT-2	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Drought and Water Supply Deficiencies
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Municipal Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Pikeland Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Pikeland Township	Plant bushes/other vegetation to stop drifting snow in known problem areas
Action Number:	
EastPikelandT-3	
Location (address, lat/long)	
	Multiple locations
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	Winter Storms
Priority (High, Medium, Low)	Medium
Estimated Cost	Low
Potential Funding Streams	Municipal Budget
Timeline	Short
Lead Agency/Department	East Pikeland Township Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Pikeland Township	Purchase temporary mobile camera to set up for events and use to monitor safety and security
Action Number:	
EastPikeland T-4	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Terrorism
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Municipal Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	East Pikeland Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Pikeland Township	Retrofit critical public facilities with safe rooms
Action Number:	
EastPikelandT-5	
Location (address, lat/long)	
Multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	Tornado and Windstorms
Priority (High, Medium, Low)	Medium
Estimated Cost	High
Potential Funding Streams	FEMA, PEMA
Timeline	Long
Lead Agency/Department	East Pikeland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Pikeland Township	The municipal FPA to work with the Cromby Generating Station facility owner/operator to protect the facility to at least the 0.2% chance flood level and from vulnerabilities to dam failure.
Action Number:	
EastPikelandT-6	
Location (address, lat/long)	
	100 Cromby Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Cromby Generating Station facility owner/operator
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Pikeland Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and vulnerabilities to dam failure: Bernard Property, Hare's Hill Road Bridge, Hartman, Peter, Residence, Kimberton Historic District, and Rapp's Covered Bridge
Action Number:	
EastPikelandT-7	
Location (address, lat/long)	
East Pikeland Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Pikeland Township	Work with the railroad industry to address safety concerns and aging rail infrastructure
Action Number:	
EastPikelandT-8	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA, HMGP, Municipal Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	East Pikeland Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Vincent Township	Protect the Shady Lane Water Treatment Plant from dam failure
Action Number:	
EastVincentT-1	
Location (address, lat/long)	
	135 Shady Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Vincent Township	The municipal FPA to work with the Columbia Gas Transmission/Birdsboro Heater facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities of potential dam failure.
Action Number:	
EastVincentT-2	
Location (address, lat/long)	
	3150 New Schuylkill Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/Department(s)	
	Columbia Gas Transmission/Birdsboro Heater facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Vincent Township	The municipal FPA to work with the Oehlert Bros., Inc facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
EastVincentT-3	
Location (address, lat/long)	
	3435 Schuylkill Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	Oehlert Bros., Inc facility owner/operator
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Vincent Township	The municipal FPA to work with the Shady Lane Plant-Royersford facility owner/operator to protect the facility from the vulnerabilities of dam failure
Action Number:	
EastVincentT-4	
Location (address, lat/long)	
	137 Shady Lane
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/Department(s)	
	Shady Lane Plant-Royersford facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Vincent Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Kennedy Covered Bridge and Parker's Ford
Action Number:	
EastVincentT-5	
Location (address, lat/long)	
East Vincent Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Whiteland Township	Increase stormwater pipe size at Hillbrook Circle
Action Number:	
EastWhitelandT-1	
Location (address, lat/long)	
	Hillbrook Circle
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	East Whiteland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Whiteland Township	Install a generator at the Meadowview pump station
Action Number:	
EastWhitelandT-2	
Location (address, lat/long)	
	317 Swedesford Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Utility Interruption
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Whiteland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Whiteland Township	Install a generator at the pump station on Flat Road
Action Number:	
East Whiteland T-3	
Location (address, lat/long)	
	601 Flat Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Utility Interruption
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Whiteland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Whiteland Township	Install gates to be closed during flood incidents and signage at Church Road
Action Number:	
EastWhitelandT-4	
Location (address, lat/long)	
	Church Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Whiteland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Whiteland Township	Install gates to be closed during flood incidents and signage at Old Morehall Road
Action Number:	
EastWhitelandT-5	
Location (address, lat/long)	
	Old Morehall Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	East Whiteland Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
East Whiteland Township	Work with management of major businesses to protect the buildings to the 0.2% annual chance flood level.
Action Number:	
EastWhitelandT-6	
Location (address, lat/long)	
East Whiteland Township, multiple locations	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
East Whiteland Township	Work with the Spring Mill Complex owner to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood event.
Action Number:	
EastWhitelandT-7	
<i>Location (address, lat/long)</i>	86 Moores Rd
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Easttown Township	Construct new stormwater management systems to address uncontrolled water runoff creating flooding of Darby Creek and its tributaries at Darby Creek Watershed
Action Number:	
EasttownT-1	
Location (address, lat/long)	
	Darby Creek
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Easttown Township	Work with Sugartown Road Bridge owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level
Action Number:	
EasttownT-2	
Location (address, lat/long)	
	Sugartown Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Elk Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Glen Hope Covered Bridge, Rudolph & Arthur Covered Bridge, and Stephens, Linton Covered Bridge
Action Number:	
ElkT-1	
Location (address, lat/long)	
Elk Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Franklin Township	Clear out blocked inlets at 896 between Goodhope Road and Gypsey Hill
Action Number:	
FranklinT-1	
<i>Location (address, lat/long)</i>	896 between Goodhope Rd and Gypsey Hill
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Franklin Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Franklin Township	Divert water on 512 Chesterville Road during heavy rain events
Action Number:	
FrankilinT-2	
Location (address, lat/long)	
	512 Chesterville Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Franklin Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Franklin Township	Improve drainage on North Clay Creek and Churchill Road
Action Number:	
FranklinT-3	
Location (address, lat/long)	
	North Clay Creek and Church
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Franklin Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Franklin Township	Improve drainage to reduce flooding at Green Bridge on Strickersville Road and Appleton Road
Action Number:	
FranklinT-4	
Location (address, lat/long)	
	Strickersville Road and Appleton Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Franklin Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Honey Brook Borough	Work with PennDOT to improve US-322 corridors to mitigate traffic accidents
Action Number:	
HoneyBrookB-1	
Location (address, lat/long)	
	322 Corridors
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Transportation Accidents
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	PennDOT, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Honey Brook Borough
Support Agency(ies)/ Department(s)	
	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Honey Brook Township	The municipal FPA to work with the Honey Brook Borough Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level.
Action Number:	
HoneyBrookT-1	
<i>Location (address, lat/long)</i>	17 Maple Street
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	FPA, Municipal EMC
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Square Borough	Improve drainage on East South Street between S Walnut and Broad Street o prevent flooding
Action Number:	
KennettSquareB-1	
<i>Location (address, lat/long)</i>	East South Street
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Kennett Square Borough
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Square Borough	Improve drainage on South Street at Lafayette and Grant Way
Action Number:	
KennettSquareB-2	
Location (address, lat/long)	
	West South Street
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Square Borough
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Square Borough	Improve drainage on Walnut Street between Birch and East South St
Action Number:	
KennettSquareB-3	
Location (address, lat/long)	
	Walnut Street
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Square Borough
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Square Borough	Improve/install drainage systems to handle rain to reduce localized flooding from Cypress St to Cedar St, west of Union St
Action Number:	
KennettSquareB-4	
Location (address, lat/long)	
	Cypress St to Cedar St
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Square Borough
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Square Borough	The municipal FPA will work with Comcast Cable-Kennell Square Hubsite owner/operator to protect the facility to the 0.2% annual chance flood level.
Action Number:	
KennettSquareB-5	
Location (address, lat/long)	
	426 Dalmatian St
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	FPA, Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Acquisition/elevation of structure located at 611 Creek Road
Action Number:	
KennettT-1	
Location (address, lat/long)	
	611 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Medium
Estimated Cost	High
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	Long
Lead Agency/Department	Municipal FPA
Support Agency(ies)/ Department(s)	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Acquisition/elevation of structure located at 903 Creek Road
Action Number:	
KennettT-2	
<i>Location (address, lat/long)</i>	903 Creek Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Acquisition/elevation of structure located at 909 Creek Road
Action Number:	
KennettT-3	
Location (address, lat/long)	
	909 Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent East Hillendale Rd from flooding
Action Number:	
KennettT-4	
<i>Location (address, lat/long)</i>	East Hillendale between McFarlyn and Bayard, Bayard to Rosedale
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Medium
<i>Lead Agency/Department</i>	Kennett Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent flooding of Kaolin Rd from stream
Action Number:	
KennettT-5	
Location (address, lat/long)	
	Kaolin Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Medium
Lead Agency/Department	
	Kennett Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent flooding of Marshall Bridge a Route 82 South
Action Number:	
KennettT-6	
Location (address, lat/long)	
Marshall Bridge at Route 82 South	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Medium	
Lead Agency/Department	
Kennett Township	
Support Agency(ies)/ Department(s)	
PennDOT	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent flooding of the West Hillendale stream from Chandler Mill to Scarlet
Action Number:	
KennettT-7	
<i>Location (address, lat/long)</i>	From Chandler Mill to Scarlet
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Medium
<i>Lead Agency/Department</i>	Kennett Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent further erosion of Bucktoe Road stream banks and prevent flooding of he road
Action Number:	
KennettT-8	
Location (address, lat/long)	
	Bucktoe Road Stream
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent Rosedale Road stream from overflowing onto the road
Action Number:	
KennettT-9	
Location (address, lat/long)	
	Rosedale Road from Walnut St to McFarlyn
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Medium
Lead Agency/Department	
	Kennett Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Assess and determine the best action to prevent the stream on Center Mill Road from overflowing
Action Number:	
KennettT-10	
Location (address, lat/long)	
Center Mill Road on Burnt Mill Road to Delaware Line	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Medium	
Lead Agency/Department	
Kennett Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Install gates to be closed during flood incidents and signaled at flood intersections within the township
Action Number:	
KennettT-11	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Kennett Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Install warning signs to be utilized during flood incidents at flood prone bridges within the township
Action Number:	
KennettT-12	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Kennett Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	The municipal FPA to work with the AT&T SBA Kennett Square facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
KennettT-13	
Location (address, lat/long)	
	225 Scarlett Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/Department(s)	
	AT&T SBA Kennett Square facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	The municipal FPA to work with the Kennett Square Borough Sewage Treatment Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
KennettT-14	
<i>Location (address, lat/long)</i>	660 W. South Street
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA, EMC
<i>Support Agency(ies)/ Department(s)</i>	Kennett Square Borough Sewage Treatment Plant facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Kennett Township	Work with county to improve drainage on Bayard Road
Action Number:	
KennettT-15	
Location (address, lat/long)	
	Bayard Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Work with the county to improve drainage on Pemberton Road Bridge from Mill Road to Cedar Springs to prevent flooding
Action Number:	
KennettT-16	
Location (address, lat/long)	
	Pemberton Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Kennett Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Kennett Township	Work with the county to improve drainage on South Street from Scarlet to Chandler Mill
Action Number:	
KennettT-17	
<i>Location (address, lat/long)</i>	South Street
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Kennett Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Britain Township	Emergency alerting systems for London Britain Township
Action Number:	
LondonBritainT-1	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	FEMA, PEMA, Regional and Local Grants and Municipal Funds
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	AGEM, Chester County
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Britain Township	Install a snow fence during snow season to prevent snow drifting on South Bank Rd
Action Number:	
LondonBritainT-2	
Location (address, lat/long)	
	South Bank Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Snow Storm
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Low
Potential Funding Streams	
	Municipal Budget
Timeline	
	Short
Lead Agency/Department	
	London Britain Township Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Britain Township	Install a snow fence during snow season to prevent snow drifting on Strickersville Rd
Action Number:	
LondonBritainT-3	
<i>Location (address, lat/long)</i>	Strickersville Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Snow Storm
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Municipal Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	London Britain Township Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Britain Township	Install gates to be closed during flood incidents and signage at Flint Hill Rd & Mercer Mill Rd
Action Number:	
LondonBritainT-4	
Location (address, lat/long)	
	Flint Road & Mercer Mill Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	London Britain Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Britain Township	Install gates to be closed during flood incidents and signage at Good Hope & London Tract Rd/Broad Run Rd
Action Number:	
LondonBritainT-5	
Location (address, lat/long)	
	Good Hope & London Tract Rd/Broad Run Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	London Britain Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Britain Township	Install gates to be closed during flood incidents and signage at London Tract Rd & New Peltier Rd
Action Number:	
LondonBritainT-6	
Location (address, lat/long)	
London Tract Road & New Peltier Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
London Britain Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Britain Township	Install gates to be closed during flood incidents and signage at Mercer Mill Rd and N. Creek Rd
Action Number:	
LondonBritainT-7	
Location (address, lat/long)	
	Mercer Road & N. Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	London Britain Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Britain Township	Install gates to be closed during flood incidents and signage at Yeatmans Station Rd
Action Number:	
LondonBritainT-8	
<i>Location (address, lat/long)</i>	Yeatmans Station Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	London Britain Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Grove Township	Emergency alerting systems/public notification system for London Grove Township
Action Number:	
LondonGroveT-1	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
All Hazards	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Low	
Potential Funding Streams	
FEMA, PEMA, Regional and Local Grants and Municipal Funds	
Timeline	
Short	
Lead Agency/Department	
London Grove Township/EMC	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Grove Township	Install alerting system/public notification system to profiteering/notification of potentially dangerous and damaging weather. Area is populated with outdoor activities and large population.
Action Number:	
LondonGroveT-2	
Location (address, lat/long)	
	15 Athlone Way
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	All Hazards
Priority (High, Medium, Low)	Low
Estimated Cost	Low
Potential Funding Streams	FEMA, PEMA, Regional and Local Grants and Municipal Funds
Timeline	Short
Lead Agency/Department	London Grove Township/EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	Install gates and signage within flood prone areas to reduce the risk of motorist and other traveling public from becoming entrapped in the flood waters.
Action Number:	
LondonGroveT-3	
Location (address, lat/long)	
	Lake Rd at Raymond Ave, East Baltimore Pk, Clay Creek Rd, E. Avondale Rd, Sullivan Rd S/O Clay Creek, Garden Station at Clay Creek, Garden Station at Elliot Rd
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	London Grove Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	Protect West Grove Sewage Treatment Plant to the 0.2% annual chance flood level.
Action Number:	
LondonGroveT-4	
<i>Location (address, lat/long)</i>	110 Valley Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA, EMC
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Grove Township	Reconfigure stream channel at Sullivan Rd & Clay Creek Rd
Action Number:	
LondonGroveT-5	
Location (address, lat/long)	
Sullivan Road & Clay Creek Road	
Mitigation Technique Category	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	High
Potential Funding Streams	Hazard Mitigation grants, Flood Mitigation grants
Timeline	Long
Lead Agency/Department	London Grove Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
London Grove Township	Reconstruct stream and roadway elevations to reduce the ability of flooding during rain and flash flood events.
Action Number:	
LondonGroveT-6	
Location (address, lat/long)	
	792 Lake Rd.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA, PEMA
Timeline	
	Long
Lead Agency/Department	
	Longson Grove Township, Public Works
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	Supply electrical connections for a portable generator at each of the wastewater facilities. Providing alternative power during power outages utilizing a portable until as opposed to three permanent generators providing additional costs savings.
Action Number:	
LondonGroveT-7	
Location (address, lat/long)	
333 Rose Hill Rd, 748 E. Avondale Rd, 15 Athelone Way	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Utility Interruption	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
London Grove Township/Public Works	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	The municipal FPA to work with the West Grove Wastewater Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
LondonGroveT-8	
<i>Location (address, lat/long)</i>	110 Valley Rd
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA, EMC
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
London Grove Township	To remove an existing failed culvert and replace it with a new structure to span the base flood elevation. Portions or all of structure removal and replacement could be completed utilizing Municipal Public Works Resources
Action Number:	
LondonGroveT-9	
Location (address, lat/long)	
	Woodview Rd- Cross Street Chatham Rd and Gap Newport Pk. 326 Woodview Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	High
Estimated Cost	High
Potential Funding Streams	FEMA, PEMA, Municipal and Private Funding
Timeline	Short
Lead Agency/Department	London Grove Township/Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	To remove an existing narrow culvert and replace with a structure to span the base flood elevations. Portions or all of the structure removal and replacements could be completed utilizing Municipal Public Works.
Action Number:	
LondonGroveT-10	
Location (address, lat/long)	
Indian Run Rd at Clay Creek Rd	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA, PEMA, Regional and Local Grants and Municipal Funds	
Timeline	
Long	
Lead Agency/Department	
London Grove Township/Public Works	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Robert Weer
Title	EMC
Agency/Department	LGT/Emergency Management
Phone	610-345-0100
E-mail	rweer@londongrove.org



Municipality(ies):	Action
London Grove Township	Widen bridge and bridge approaches at Indian Run Rd
Action Number:	
LondonGroveT-11	
Location (address, lat/long)	
	Indian Run Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Long
Lead Agency/Department	
	London Grove Township Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Londonderry Township	Work with PennDOT to clear the brush in roadway lines of sight at Rt 796 and Rt 41
Action Number:	
LondonderryT-1	
Location (address, lat/long)	
	Rt 796 and Rt. 41
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Transportation Accidents
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget; PA DEP
Timeline	
	Short
Lead Agency/Department	
	Londonderry Township
Support Agency(ies)/ Department(s)	
	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Londonderry Township	Work with PennDOT to construct a roundabout at the intersection of PA Route 41 and PA route 926
Action Number:	
LondonderryT-2	
<i>Location (address, lat/long)</i>	PA Rte. 41 and PA Rte. 926
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	PennDOT, Londonderry Township
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Londonderry Township
<i>Support Agency(ies)/ Department(s)</i>	PennDOT
Project Point of Contact	
<i>Name</i>	Louis F. Simone
<i>Title</i>	Chairman Board of Supervisors
<i>Agency/Department</i>	Londonderry Township
<i>Phone</i>	610-869-2138
<i>E-mail</i>	lfsimone@zoominternet.net



Municipality(ies):	Action
Londonderry Township	Emergency alerting systems/public notification system for Londonderry Township
Action Number:	
LondonderryT-3	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	FEMA, PEMA, Regional and Local Grants and Municipal Funds
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Londonderry Township/EMC
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Londonderry Township	Improve and enhance culverts on Jackson Rd and Faggs Manor Rd
Action Number:	
LondonderryT-4	
Location (address, lat/long)	
	Jackson Road and Faggs Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Medium
Estimated Cost	Medium
Potential Funding Streams	State funding
Timeline	Short
Lead Agency/Department	Londonderry Township
Support Agency(ies)/ Department(s)	PennDOT
Project Point of Contact	
Name	Louis F. Simone
Title	Chairman Board of Supervisors
Agency/Department	Londonderry Township
Phone	610-869-2138
E-mail	lfsimone@zoominternet.net



Municipality(ies):	Action
Londonderry Township	Improve plans and communication in case of emergency.
Action Number:	
LondonderryT-5	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Environmental Hazards Gas and Liquid Pipelines
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	ESNG
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	ESNG
<i>Support Agency(ies)/ Department(s)</i>	Londonderry Township, Cochranville Fire Co
Project Point of Contact	
<i>Name</i>	Louis F. Simone
<i>Title</i>	Chairman Board of Supervisors
<i>Agency/Department</i>	Londonderry Township
<i>Phone</i>	610-869-2138
<i>E-mail</i>	lfsimone@zoominternet.net



Municipality(ies):	Action
Londonderry Township	Increase the height of the bridge at Whitehorse Rd near Creek Rd
Action Number:	
LondonderryT-6	
Location (address, lat/long)	
	Whitehorse Rd and Creek Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Londonderry Township
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Londonderry Township	Install a generator in the Township Building
Action Number:	
LondonderryT-7	
Location (address, lat/long)	
	103 Daleville Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Utility Interruption
Priority (High, Medium, Low)	High
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC; Operating Budget
Timeline	Short
Lead Agency/Department	Londonderry Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Louis F. Simone
Title	Chairman Board of Supervisors
Agency/Department	Londonderry Township
Phone	610-869-2138
E-mail	lfsimone@zoominternet.net



Municipality(ies):	Action
Londonderry Township	Obtain approximately 1 mile of snow fencing or install natural landscapes to stop snow drifting along White Horse Rd by Power Station
Action Number:	
LondonderryT-8	
Location (address, lat/long)	
	White Horse Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Snow Storm
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Low
Potential Funding Streams	
	Municipal Budget
Timeline	
	Short
Lead Agency/Department	
	Londonderry Township Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Londonderry Township	Purchase 2-way radios to assist in communication during emergency events in the township
Action Number:	
LondonderryT-9	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	County; SEPA RTF
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Londonderry Township
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Londonderry Township	Purchase and install a backup generator at the Municipal Building
Action Number:	
LondonderryT-10	
Location (address, lat/long)	
	Municipal Building
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Utility Interruption
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Londonderry Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Londonderry Township	Work with PennDOT to reconstruct the intersection to allow for better water drainage and strength the road at Fernwood Rd and Jackson Rd
Action Number:	
LondonderryT-11	
Location (address, lat/long)	
Fernwood Rd and Jackson Rd	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
PennDOT, Operating Budget	
Timeline	
Long	
Lead Agency/Department	
Londonderry Township	
Support Agency(ies)/ Department(s)	
PennDOT	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Lower Oxford Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Octoraro Water Company and Pine Grove Covered Bridge
Action Number:	
LowerOxfordT-1	
Location (address, lat/long)	
Lower Oxford Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structure located at 135 Powelton Ave
Action Number:	
MalvernB-1	
Location (address, lat/long)	
	135 Powelton Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structure located at 145 Powelton Ave
Action Number:	
MalvernB-2	
Location (address, lat/long)	
	145 Powelton Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structures 10 through 142 W First Ave
Action Number:	
MalvernB-3	
Location (address, lat/long)	
	10-142 W First Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structures 193 through 323 Paoli Pike
Action Number:	
MalvernB-4	
Location (address, lat/long)	
	193-323 Paoli Pike
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structures 2 through 10 Remington Ln
Action Number:	
MalvernB-5	
Location (address, lat/long)	
	2-10Remington Ln
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	Elevation/Acquisition of structures 217 through 545 S. Warren Ave
Action Number:	
MalvernB-6	
Location (address, lat/long)	
	127-545 S. Warren Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Increase culvert size at 313 S Warren Ave
Action Number:	
MalvernB-7	
Location (address, lat/long)	
	313 S Warren Ave
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Malvern Borough
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Malvern Borough	Work with management of Malvern Preparatory School to protect the buildings to the 0.2% annual chance flood level.
Action Number:	
MalvernB-8	
Location (address, lat/long)	
	418 S Warren Ave.
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	Determine the specific vulnerability of the Modena Borough Building to dam failure and determine appropriate mitigation measures.
Action Number:	
ModenaB-1	
Location (address, lat/long)	
5 N Brandywine Ave.	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Protect Modena Ambulance EMS Station from vulnerabilities to dam failure.
Action Number:	
ModenaB-2	
Location (address, lat/long)	
	5 N Brandywine Avenue
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Protect Modena FC Fire Station from a potential dam failure.
Action Number:	
ModenaB-3	
<i>Location (address, lat/long)</i>	5 N Brandywine Avenue
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	The Municipal FPA will work with the Mahoney-Modena owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.
Action Number:	
ModenaB-4	
<i>Location (address, lat/long)</i>	6 Union St
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Modena Borough	The Municipal FPA will work with the Sealed Air Corporation owner/operator to protect the facility to the 0.2% annual chance flood level and from the vulnerably from dam failure.
Action Number:	
ModenaB-5	
Location (address, lat/long)	
	22 Meredith CT PO BOX 158
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Modena Borough	Work with the Mode Paper Mill owner to determine what flood protection measures can be taken to protect it from the vulnerabilities of dam failure.
Action Number:	
ModenaB-6	
Location (address, lat/long)	
39.963314726, -75.8051495759999	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Newlin Township	Determine the specific vulnerability of the Newlin Township Building to dam failure and determine appropriate mitigation measures.
Action Number:	
NewlinT-1	
Location (address, lat/long)	
	1751 Embreeville Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Newlin Township	Fix and pave road that has been destroyed on Laurel Road including three driveways
Action Number:	
NewlinT-2	
<i>Location (address, lat/long)</i>	Laurel Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	Newlin Township
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Newlin Township	Protect the Embreeville Sewage Treatment from dam failure and protect it to the 0.2% annual chance flood event and from vulnerabilities to dam failure.
Action Number:	
NewlinT-3	
Location (address, lat/long)	
	1780 Embreeville Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Newlin Township	Replant Ash Trees that were lost to the Ash Borer and determine the best actions to prevent invasive species in the future
Action Number:	
NewlinT-4	
Location (address, lat/long)	
Newlin Township, multiple locations	
Mitigation Technique Category	
Natural Systems Protection (NSP)	
Hazard(s) Addressed	
Invasive Species	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Medium	
Potential Funding Streams	
Operating budget	
Timeline	
Short	
Lead Agency/Department	
Newlin Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Newlin Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Embreeville Historic District, House at Upper Laurel Iron Works, Marlborough Village Historic District, Spruce Groce School House, Worker's House at Lower Laurel Iron Works
Action Number:	
NewlinT-5	
Location (address, lat/long)	
Newlin Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
New Garden Township	Construct larger culvert at Cedar Springs Rd at Pemberton Rd
Action Number:	
NewGardenT-1	
Location (address, lat/long)	
	Cedar Springs Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	New Garden Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
New Garden Township	Construct larger culvert at Egypt Run Road
Action Number:	
NewGardenT-2	
Location (address, lat/long)	
Egypt Run Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	
Timeline	
Short	
Lead Agency/Department	
New Garden Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Emergency alerting systems for New Garden Township
Action Number:	
NewGardenT-3	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	All Hazards
Priority (High, Medium, Low)	Low
Estimated Cost	Low
Potential Funding Streams	FEMA, PEMA, Regional and Local Grants and Municipal Funds
Timeline	Short
Lead Agency/Department	New Garden Township /EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Chambers Rd and Baltimore Pike
Action Number:	
NewGardenT-4	
<i>Location (address, lat/long)</i>	Chambers Rd and Baltimore Pike
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	New Garden Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Newark Rd and Baltimore Pike
Action Number:	
NewGardenT-5	
<i>Location (address, lat/long)</i>	Newark Rd and Baltimore Pike
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	New Garden Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Newark Rd and Rt 41
Action Number:	
NewGardenT-6	
<i>Location (address, lat/long)</i>	Newark Rd and Rt 41
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget, PennDOT
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	New Garden Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Penn Green Rd and Rt 41
Action Number:	
NewGardenT-7	
Location (address, lat/long)	
	Penn Green Rd and Rt 41
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Utility Interruption
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget, PennDOT
Timeline	
	Short
Lead Agency/Department	
	New Garden Township/Public Works
Support Agency(ies)/ Department(s)	
	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Scarlett Rd and Baltimore Pike
Action Number:	
NewGardenT-8	
Location (address, lat/long)	
Scarlett Rd and Baltimore Pike	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Utility Interruption	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget, PennDOT	
Timeline	
Short	
Lead Agency/Department	
New Garden Township/Public Works	
Support Agency(ies)/ Department(s)	
PennDOT	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Purchase portable generator for traffic signal at Southwood Rd and Rt 7
Action Number:	
NewGardenT-9	
<i>Location (address, lat/long)</i>	Southwood Rd and Rt 7
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget, PennDOT
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	New Garden Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
New Garden Township	Work with To-jo Mushrooms Inc. management to protect the building to the 0.2% annual chance flood level.
Action Number:	
NewGardenT-10	
Location (address, lat/long)	
	974 Penn Green Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	To-jo Mushrooms Inc. management
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
North Coventry Township	Protect the North Coventry Municipal Authority from dam failure and to the 0.2% annual chance flood level.
Action Number:	
NorthCoventryT-1	
Location (address, lat/long)	
	1485 e Schuylkill Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
North Coventry Township	The municipal FPA to work with the North Coventry Municipal Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure
Action Number:	
NorthCoventryT-2	
Location (address, lat/long)	
	1485 e Schuylkill Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	North Coventry Municipal Authority facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
North Coventry Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Schuylkill Navigation Company Canal and historic structure located on SR 7046
Action Number:	
NorthCoventryT-3	
Location (address, lat/long)	
North Coventry Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Oxford Borough	Rain gardens to be installed in recently created bump-outs on Broad Street at intersection with 8th Street.
Action Number:	
OxfordB-1	
Location (address, lat/long)	
Broad Street at intersection with 8th Street	
Mitigation Technique Category	
Natural Systems Protection (NSP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Grants and/or general fund revenues	
Timeline	
Short	
Lead Agency/Department	
Oxford Borough	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Arlene Harrison
Title	Interim Borough Manager
Agency/Department	Oxford Borough
Phone	610-932-2500 ext. 1302
E-mail	treasurer@oxfordboro.org



Municipality(ies):	Action
Parkeburg Borough	The municipal FPA will work with the Hayes Heating and Cooling Bulk owner/operator to protect the facility to the 0.2% annual chance flood level.
Action Number:	
ParkeburgB-1	
Location (address, lat/long)	
	130 S Church St
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/Department(s)	
	Hayes Heating and Cooling Bulk owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Parkesburg Borough	Work with power company to protect Parkesburg - N Church St Electrical Substation to the 0.2% annual chance flood level.
Action Number:	
ParkesburgB-2	
<i>Location (address, lat/long)</i>	83 N Church Street
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Penn Township	Enhance stormwater management regulations
Action Number:	
PennT-1	
<i>Location (address, lat/long)</i>	Penn Township, multiple locations
<i>Mitigation Technique Category</i>	Local Plans and Regulations (LPR)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Municipal Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Penn Township	Work with power company to protect Penn - Newark Road Electrical Substation to the 0.2% annual chance flood level.
Action Number:	
PennT-2	
<i>Location (address, lat/long)</i>	2989 Newark Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Pennsbury Township	Install warning signals at unguarded railroad crossing at US Rt 1 at the railroad tracks by Fairville Rd
Action Number:	
PennsburyT-1	
Location (address, lat/long)	
	US Rt 1
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	PennDOT, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Pennsbury Township
Support Agency(ies)/Department(s)	
	PennDOT
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Pennsbury Township	Install warning signals for times when road is closed due to flooding on US Rt 1 in the area of the Brandywine creek
Action Number:	
Pennsbury T-2	
Location (address, lat/long)	
	US Rt 1
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	PennDOT, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Pennsbury Township
Support Agency(ies)/Department(s)	
	PennDOT
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Pennsbury Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Bissel/Hill Girt/Beverly Rural Historic District and Delaware Boundary Makers.
Action Number:	
Pennsbury T-3	
Location (address, lat/long)	
Pennsbury Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/Department(s)	
Owners/operators	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Phoenixville Borough	Improve drainage at the intersection of Bridge and Church St.
Action Number:	
PhoenixvilleB-1	
Location (address, lat/long)	
	Bridge and Church St
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Phoenixville Borough
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Phoenixville Borough	Protect the District Court 15-2-01 to the 0.2% annual chance flood level.
Action Number:	
PhoenixvilleB-2	
Location (address, lat/long)	
	347 Bridge Street
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Phoenixville Borough	Protect the Phoenixville Boro PD to the 0.2% annual chance flood level.
Action Number:	
PhoenixvilleB-3	
Location (address, lat/long)	
	351 Bridge Street
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Phoenixville Borough	Protect the Phoenixville Water Treatment to the 0.2% annual chance flood event and from dam failure.
Action Number:	
PhoenixvilleB-4	
<i>Location (address, lat/long)</i>	49 Water Street
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Phoenixville Borough	The municipal FPA to work with the Phoenixville Water Plant facility owner/operator to protect the facility to at least the 0.2% chance flood level and from the vulnerabilities to dam failure.
Action Number:	
PhoenixvilleB-5	
<i>Location (address, lat/long)</i>	49 Waer St
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Phoenixville Borough	Work with the management of major businesses to protect the buildings from dam failure and to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.
Action Number:	
PhoenixvilleB-6	
<i>Location (address, lat/long)</i>	Phoenixville Borough, multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Phoenixville Borough	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Black Rock Bridge, Lobok, John, Property, Mansion House, and Phoenixville Canal Spur
Action Number:	
Phoenixville B-7	
Location (address, lat/long)	
Phoenixville Borough, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Pocopson Township	Assess and determine the best action to prevent flooding around Brandywine Creek on Northbrook Road, one lane historical bridge
Action Number:	
PocopsonT-1	
Location (address, lat/long)	
	Northbrook Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Pocopson Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Pocopson Township	Stabilize existing roadway in danger of collapse from damage due to frequent flooding of Brandywine Creek, with retaining wall and guide rail system. This will improve traffic safety for local residents, allow for better access by EMS vehicles, and mitigate the damage from future flooding
Action Number:	
PocopsonT-2	
Location (address, lat/long)	
608 W Creek Rd, (Pocopson Township), West Chester, 19382	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Transportation Accidents, Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
2021 Pocopson Township budget	
Timeline	
Short	
Lead Agency/Department	
Pocopson Township Public Works Department	
Support Agency(ies)/ Department(s)	
Gilmore and Associates	
Project Point of Contact	
Name	Mark Knightly
Title	Public Works Department
Agency/Department	Pocopson Township Public Works Department
Phone	610-793-2387
E-mail	publicworks@pocopson.org



Municipality(ies):	Action
Pocopson Township	The municipal FPA to work with the Lenape Forged Products Corp facility owner/operator to protect the facility from the vulnerabilities of dam failure.
Action Number:	
PocopsonT-3	
Location (address, lat/long)	
	1334 Lenape Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA, EMC
Support Agency(ies)/ Department(s)	
	Lenape Forged Products Corp facility owner/operator
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Pocopson Township	Work with power company to protect the Pocopson - Lenape Unionville Road Electrical Substation to the 0.2% annual chance flood level.
Action Number:	
PocopsonT-4	
<i>Location (address, lat/long)</i>	1762 Lenape Unionville Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Pocopson Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Pocopson Station, State Route 3027, and Wilkinson House
Action Number:	
PocopsonT-5	
Location (address, lat/long)	
Pocopson Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Sadsbury Township	Assess and determine the best action to improve drainage and reduce flooding on Greenbelt Drive
Action Number:	
SadsburyT-1	
Location (address, lat/long)	
	Greenbelt Drive
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Sadsbury Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Sadsbury Township	Install gates to be closed during flood incidents and signage on sections of Old Mill Road
Action Number:	
SadsburyT-2	
<i>Location (address, lat/long)</i>	Old Mill Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Sadsbury Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Schuylkill Township	Acquisition/Elevation of the structure located at 493 State Creek Road
Action Number:	
SchuylkillT-1	
Location (address, lat/long)	
	493 State Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Schuylkill Township	Construct Larger Culvert at East Phillip Drive
Action Number:	
SchuylkillT-2	
Location (address, lat/long)	
	East Phillip Drive
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Schuylkill Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Construct larger culvert at S Whitehorse Road
Action Number:	
SchuylkillT-3	
Location (address, lat/long)	
S Whitehorse Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	
Timeline	
Short	
Lead Agency/Department	
Schuylkill Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Determine specific vulnerability to dam failure and determine appropriate mitigation measures for the Valley Forge Sewage Treatment Plant
Action Number:	
SchuylkillT-4	
Location (address, lat/long)	
	333 Pawling Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Plant bushes/other vegetation to stop drifting snow in known problem areas
Action Number:	
SchuylkillT-5	
Location (address, lat/long)	
Schuylkill Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Winter Storms	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
Low	
Potential Funding Streams	
Municipal Budget	
Timeline	
Short	
Lead Agency/Department	
Schuylkill Township Public Works	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Protect Structure with Barrier at Creek Road Bridge
Action Number:	
SchuylkillT-6	
Location (address, lat/long)	
	Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	Short
Lead Agency/Department	Schuylkill Township
Support Agency(ies)/ Department(s)	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Retrofit critical public facilities with safe rooms
Action Number:	
SchuylkillT-7	
<i>Location (address, lat/long)</i>	Schuylkill Township, multiple locations
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Terrorism
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA, PEMA
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Schuylkill Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Schuylkill Township	The municipal FPA to work with the Aqua Pickering Water Treatment facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
SchuylkillT-8	
Location (address, lat/long)	
	1011 Valley Forge Rd
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES, LEPC
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	The municipal FPA to work with the Valley Forge Sewer Authority facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
Schuylkill T-9	
Location (address, lat/long)	
	333 Pawling Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Schuylkill Township	Work with power company to protect Schuylkill - Valley Forge Road to the 0.2% annual chance flood level.
Action Number:	
Schuylkill T-10	
Location (address, lat/long)	
	1115 Valley Forge Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Schuylkill Township	Work with YMCA management to protect the building to the 0.2% annual chance flood level.
Action Number:	
Schuylkill T-11	
Location (address, lat/long)	
	400 E. Pothouse Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
South Coatesville Borough	Investigate stormwater management options and identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents throughout South Coatesville Borough
Action Number:	
SouthCoatesvilleB-1	
<i>Location (address, lat/long)</i>	Multiple locations
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	South Coatesville Borough
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
South Coatesville Borough	Protect the Coatesville Sewer Authority from dam failure and to the 0.2% annual chance flood level.
Action Number:	
SouthCoatesvilleB-2	
Location (address, lat/long)	
3250 Interstate Drive	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
DES, LEPC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
South Coatesville Borough	The municipal FPA will work with the Scrap Metal Services owner/operator to protect the facility to the 0.2% annual chance level.
Action Number:	
SouthCoatesvilleB-3	
Location (address, lat/long)	
	1002 S 1st Ave
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
South Coventry Township	Construct larger culvert at Bealor Road
Action Number:	
SouthCoventryT-1	
Location (address, lat/long)	
	Bealor Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	South Coventry Township
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
South Coventry Township	Determine the best action to prevent downhill flooding on Coventryville Rd & Harmonyville Road, close to North Cov. Border
Action Number:	
SouthCoventryT-2	
<i>Location (address, lat/long)</i>	Coventryville Rd & Harmonyville Road, close to North Cov. Border
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	South Coventry Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
South Coventry Township	Install flood water collection boxes and piping on Schoolhouse Road and Porter's Mill Road
Action Number:	
SouthCoventryT-3	
Location (address, lat/long)	
	Schoolhouse Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	County
Timeline	
	Short
Lead Agency/Department	
	South Coventry Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
South Coventry Township	Purchase and install a backup generator for the Woodridge Sewer Plant at 190 Ridgeview Drive
Action Number:	
SouthCoventryT-4	
<i>Location (address, lat/long)</i>	190 Ridgeview Drive
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	South Coventry Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
South Coventry Township	Work with power company to protect South Coventry - Porters Mill Road Electrical Substation to the 0.2% annual chance flood level.
Action Number:	
SouthCoventryT-5	
Location (address, lat/long)	
	100 Porters Mill Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
South Coventry Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Coventryville Historic District and Coventryville Historic District (1975)- HDA
Action Number:	
SouthCoventryT-6	
Location (address, lat/long)	
South Coventry Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Spring City Borough	Protect the Spring City Sewer Plan from the vulnerably to dam failure and to the 0.2% annual chance flood level.
Action Number:	
SpringCityB-1	
Location (address, lat/long)	
	99 Gay St
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Spring City Borough	The municipal FPA will work with the Hydromotion owner/operator to protect the facility from the vulnerabilities of dam failure
Action Number:	
SpringCityB-2	
Location (address, lat/long)	
	85 East Bridge Street
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	Dam Failure
Priority (High, Medium, Low)	Medium
Estimated Cost	High
Potential Funding Streams	Operating Budget
Timeline	
Lead Agency/Department	Municipal FPA, EMC
Support Agency(ies)/ Department(s)	DES, LEPC
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Spring City Borough	Work with management of major businesses to protect the buildings from the vulnerably to dam failure and to the 0.2% annual chance flood level.
Action Number:	
SpringCityB-3	
Location (address, lat/long)	
Spring City Borough, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Spring City Borough	Work with the Textile Mill owner to determine what flood protection measures can be taken to protect the facility from the vulnerabilities from dam failure
Action Number:	
SpringCityB-4	
<i>Location (address, lat/long)</i>	40.180630039, -75.5484935229999
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Thornbury Township	Work with PennDOT to conduct an assessment of flood prone areas along roadway Rt 926 from Rt 202 to Cheyney Rd
Action Number:	
ThornburyT-1	
Location (address, lat/long)	
	Rt 926
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Low
Potential Funding Streams	
	PennDOT, Municipal Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/Department(s)	
	Thornbury Township
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Thornbury Township	Install gates to be closed during flood incidents and signage at Rt 926 and Creek Road
Action Number:	
ThornburyT-2	
Location (address, lat/long)	
	Rt 926 and Creek Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/ Department(s)	
	Thornbury Township
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Thornbury Township	Install gates to be closed during flood incidents and signage at Rt 926 and S. Westtown Rd
Action Number:	
ThornburyT-3	
Location (address, lat/long)	
	Rt 926 and S. Westtown Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/Department(s)	
	Thornbury Township
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Thornbury Township	Install gates to be closed during flood incidents and signage at Rt 926 and Westtown-Thornton Rd
Action Number:	
ThornburyT-4	
Location (address, lat/long)	
	Rt 926 and Westtown-Thornton
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/ Department(s)	
	Thornbury Township
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Thornbury Township	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd north of Railroad Bridge
Action Number:	
ThornburyT-5	
Location (address, lat/long)	
	Westtown-Thornton Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/Department(s)	
	Thornbury Township
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Thornbury Township	Install gates to be closed during flood incidents and signage at Westtown-Thornton Rd south of Railroad Bridge
Action Number:	
ThornburyT-6	
Location (address, lat/long)	
	Westtown-Thornton Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	PennDOT
Support Agency(ies)/Department(s)	
	Thornbury Township
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Thornbury Township	Work with power company to protect Thornbury - Westtown Road Electrical Substation to the 0.2% annual chance flood level and from the vulnerabilities to dam failure.
Action Number:	
ThornburyT-7	
<i>Location (address, lat/long)</i>	1210 S Westtown Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam, Dam Failure
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Tredyffrin Township	Clogged inverts throughout the township causing flooding
Action Number:	
TredyffrinT-1	
Location (address, lat/long)	
Tredyffrin Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	Short
Lead Agency/Department	DES, Tredyffrin Township
Support Agency(ies)/ Department(s)	PennDOT
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Tredyffrin Township	Improve drainage to reduce flooding on Hadwick Road and Upper Weedly Road
Action Number:	
TredyffrinT-2	
Location (address, lat/long)	
Hadwick Road and Upper Weedly Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Tredyffrin Township	
Support Agency(ies)/ Department(s)	
DES	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Tredyffrin Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Cedar Hollow Industrial Track: Bridge, County Bridge No. 171, Great Valley Mill, Jerman, Thomas, Property, and historic structure on SR 7015
Action Number:	
TredyffrinT-3	
Location (address, lat/long)	
Tredyffrin Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Tredyffrin Township	Improve drainage to reduce flooding on Wills Lane, Woodcrest Drive, and Saunders Drive
Action Number:	
TredyffrinT-4	
Location (address, lat/long)	
Wills Lane, Woodcrest Drive, and Saunders Drive	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Tredyffrin Township	
Support Agency(ies)/ Department(s)	
DES	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Acquisition/elevation of the structure located at 2 Kiloran Wynd
Action Number:	
UpperUwchlanT-1	
Location (address, lat/long)	
	2 Kiloran Wynd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Acquisition/elevation of the structure located at 80 Saint Andrews Ln
Action Number:	
UpperUwchlanT-2	
<i>Location (address, lat/long)</i>	80 Saint Andrews Ln
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Protect Larkins Bridge with barrier
Action Number:	
UpperUwchlanT-3	
Location (address, lat/long)	
	Larkins Bridge
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Protect structure with barrier on Dorothy Lane
Action Number:	
UpperUwchlanT-4	
Location (address, lat/long)	
	Dorothy Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Protect structure with barrier on Font Road
Action Number:	
UpperUwchlanT-5	
Location (address, lat/long)	
	Font Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Upper Uwchlan Township	Protect structure with barrier on Lyndell Road
Action Number:	
UpperUwchlanT-6	
Location (address, lat/long)	
Lyndell Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
Medium	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Upper Uwchlan Township	Protect structure with barrier on Moore Road and Turnstone Way
Action Number:	
UpperUwchlanT-7	
Location (address, lat/long)	
	Moore Road and Turnstone Way
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Upper Uwchlan Township	Protect structure with barrier on St Andrews Lane
Action Number:	
UpperUwchlanT-8	
Location (address, lat/long)	
	Saint Andrews Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Protect Windsor Schoolhouse with barrier
Action Number:	
UpperUwchlanT-9	
Location (address, lat/long)	
	Windsor Schoolhouse
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Raise Fellowship Road roadway at Red Bone Road
Action Number:	
UpperUwchlanT-10	
Location (address, lat/long)	
	Fellowship Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Upper Uwchlan Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Upper Uwchlan Township	Stormwater culvert and basin re-sizing on Greenridge Road
Action Number:	
UpperUwchlanT-11	
Location (address, lat/long)	
	Greenridge Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	Short
Lead Agency/Department	Upper Uwchlan Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Upper Uwchlan Township	Stormwater culvert and basin re-sizing on Krauser Rd
Action Number:	
UpperUwchlanT-12	
Location (address, lat/long)	
	Krauser Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Upper Uwchlan Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Valley Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from vulnerabilities to dam failure: County Bridge No. 101 and Scott Farm Property
Action Number:	
ValleyT-1	
Location (address, lat/long)	
Valley Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA, EMC	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Valley Township	Assess and determine the best action to protect Wagontown Road near the West Branch of the Brandywine Creek, and implement the action.
Action Number:	
ValleyT-2	
Location (address, lat/long)	
	Wagontown Road (between Manor Road and Glencrest Road)
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam; Hurricane and Tropical Storm; Utility Interruption
Priority (High, Medium, Low)	High
Estimated Cost	\$2-3 million
Potential Funding Streams	Capital Improvement Program; CDBG; BRIC
Timeline	Short
Lead Agency/Department	EMC
Support Agency(ies)/Department(s)	FPA; Public Works; Chester County DES; Chester County Department of Community Development
Project Point of Contact	
Name	Joe Sciandra
Title	Emergency Management Coordinator
Agency/Department	Valley Township
Phone	484-401-4443
E-mail	jsciandra@valleytownship.org



Municipality(ies):	Action
Valley Township	Assess drainage into Sucker Run near South Park Avenue and PA-372 to identify the best action to prevent flooding during heavy rainfall events, and implement the action.
Action Number:	
ValleyT-3	
<i>Location (address, lat/long)</i>	South Park Avenue at PA-372
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Capital Improvement Program; CDBG; BRIC
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	FPA
<i>Support Agency(ies)/ Department(s)</i>	EMC, Public Works
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Wallace Township	Protect Glenmoore FC Fire Station from a potential dam failure
Action Number:	
WallaceT-1	
Location (address, lat/long)	
	578 Fairview Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Wallace Township	The municipal FPA to work with the Verizon Glenmoore ESS Bldg. facility owner/operator to protect the facility from the vulnerabilities to dam failure
Action Number:	
WallaceT-2	
Location (address, lat/long)	
	540 Fairview S
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Wallace Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to dam failure: Glenmoore Historic District and Steels Bridge
Action Number:	
WallaceT-3	
Location (address, lat/long)	
Wallace Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Warwick Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Hockley Mill Farm, Knauer Patent Thematic District, North Warwick Historic & Archaeological District (HDA), North Warwick HDA, and historic structure located on SR 7015
Action Number:	
WarwickT-1	
Location (address, lat/long)	
Warwick Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Bradford Township	Acquire and install back-up generator at Wastewater Treatment Plant
Action Number:	
WestBradfordT-1	
<i>Location (address, lat/long)</i>	Wastewater Treatment Plant
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	West Bradford Township/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Bradford Township	Improve drainage on Broad Run Road between Beacon Hill
Action Number:	
WestBradfordT-2	
Location (address, lat/long)	
	Broad Run Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Bradford Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Bradford Township	Install 4 gates to be closed during flood incidents and signage at Downingtown Pike between Harmony Hill Rd and Skelp Level Rd
Action Number:	
WestBradfordT-3	
Location (address, lat/long)	
Downingtown Borough, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
West Bradford Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Bradford Township	Protect the Broad Run Sewage Treatment Plant from dam failure and to the 0.2% annual chance flood level.
Action Number:	
WestBradfordT-4	
Location (address, lat/long)	
	1201 Sawmill Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget, Sewer Grant; Sewer Fees
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Bradford Township	Work with the management of Ram-t Construction Specialist to protect the buildings from dam failure.
Action Number:	
WestBradfordT-5	
Location (address, lat/long)	
	1121 Downingtown Pike
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	Ram-t Construction management
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Bradford Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level and from the vulnerabilities to flooding: Derbydown Homestead, Northbrook Historic District, Pennsylvania Railroad: Morrisville Lien: Viaduct
Action Number:	
WestBradfordT-6	
Location (address, lat/long)	
Wes Bradford Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Brandywine Township	Work with the Grow, James, House property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.
Action Number:	
WestBrandywineT-1	
Location (address, lat/long)	
40.00491284, -75.82310152	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam, Dam Failure	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC, FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Chester Borough	Obtain a backup generator for Goodwill Fire Company
Action Number:	
WestChesterB-1	
<i>Location (address, lat/long)</i>	Goodwill Fire Company
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Utility Interruption
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC; Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	West Chester Borough/Public Works
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Chester Borough	The municipal FPA to work with the National Foam facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestChesterB-2	
Location (address, lat/long)	
	350 E Union St
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Fallowfield Township	Work with the Ross Fording Road Bridge property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.
Action Number:	
WestFallowfieldT-1	
Location (address, lat/long)	
39.882755535, -75.9916449689999	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Goshen Township	Improve culvert at 103 Oak Lane
Action Number:	
WestGoshenT-1	
Location (address, lat/long)	
	103 Oak Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	West Garden Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Goshen Township	Install 3 gates to be closed during flood incidents and signage at East Chestnut and Montgomery
Action Number:	
WestGoshenT-2	
Location (address, lat/long)	
	East Chestnut and Montgomery
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Goshen Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Goshen Township	The municipal FPA to work with the A. Duie Plyle PB II Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestGoshenT-3	
Location (address, lat/long)	
	100 S Limestone Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Goshen Township	The municipal FPA to work with the A. Duie Plye Bolmar Street Warehouse facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestGoshenT-4	
Location (address, lat/long)	
	830 S Bolmar St
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Goshen Township	The municipal FPA to work with the A. Duie Pyle West Chester Truck Terminal facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestGoshenT-5	
Location (address, lat/long)	
	650 Westtown Road
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Goshen Township	The municipal FPA to work with the Wire and Cable Specialties facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestGoshenT-6	
Location (address, lat/long)	
	205 Carter Drive
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Goshen Township	Work with the Greystone Hall property owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.
Action Number:	
WestGoshenT-7	
Location (address, lat/long)	
	Phoenixville Pike
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Marlborough Township	Assess and determine the best actions to prevent flooding on bridges along Rt 82 from Unionville to Coatesville
Action Number:	
WestMarlboroughT-1	
Location (address, lat/long)	
	Rt 82 from Unionville to Coatesville
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Marlborough Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Marlborough Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: House at Springdell, Pennock, Martha House & Industrial Site, and Speakman No.1 Covered Bridge
Action Number:	
WestMarlboroughT-2	
Location (address, lat/long)	
West Marlborough Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Nantmeal Township	Work with the Isabella Furnace owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.
Action Number:	
WestNantmealT-1	
<i>Location (address, lat/long)</i>	Bollinger Drive
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Nottingham Township	Install gates to be closed during flood incidents and signage at Fremont Road between Willow Road and King Pen Road
Action Number:	
WestNottinghamT-1	
Location (address, lat/long)	
	Fremont Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Nottingham Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Nottingham Township	Install gates to be closed during flood incidents and signage at Park Road between Veteran's Drive and Sand Hill Road
Action Number:	
WestNottinghamT-2	
Location (address, lat/long)	
	Park Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Nottingham Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Pikeland Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Anselma Mill District-HDA, Clinger-Moses Mill Complex, Lightfoot Mill, and Vitale House
Action Number:	
WestPikelandT-1	
Location (address, lat/long)	
West Pikeland Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Vincent Township	Backup Generators (2) Acquisition and Installation at Matthews Meadows Sewer Plant
Action Number:	
WestVincentT-1	
Location (address, lat/long)	
	Matthews Meadows Sewer Plant
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Utility Interruption
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	West Vincent Township/Public Works
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Vincent Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Halls Covered Bridge, Tyson's Bridge, and historic structure on Kimberton Road
Action Number:	
WestVincentT-2	
<i>Location (address, lat/long)</i>	West Vincent Township, multiple locations
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 116 N. Locust Lane
Action Number:	
WestWhitelandT-1	
Location (address, lat/long)	
	116 N. Locust Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 117 N. Locust Lane
Action Number:	
WestWhitelandT-2	
Location (address, lat/long)	
	117 N. Locust Lane
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 117 Valley Road
Action Number:	
WestWhitelandT-3	
Location (address, lat/long)	
	117 Valley Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 118 Valley Road
Action Number:	
WestWhitelandT-4	
<i>Location (address, lat/long)</i>	117 Valley Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 120 Valley Road
Action Number:	
WestWhitelandT-5	
Location (address, lat/long)	
	117 Valley Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/Acquisition of structure located at 510 Winding Way
Action Number:	
WestWhitelandT-6	
Location (address, lat/long)	
	117 Valley Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 512 Winding Way
Action Number:	
WestWhitelandT-7	
<i>Location (address, lat/long)</i>	117 Valley Road
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Elevation/acquisition of structure located at 513 Winding Way
Action Number:	
WestWhitelandT-8	
Location (address, lat/long)	
	117 Valley Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Long
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
West Whiteland Township	Remove silt/clean Valley Creek bed
Action Number:	
WestWhitelandT-9	
<i>Location (address, lat/long)</i>	Valley Creek
<i>Mitigation Technique Category</i>	Natural Systems Protection (NSP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	Operating Budget; PA DEP
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	West Whiteland Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	The municipal FPA to work with the Verizon Exton ESS Bldg. facility owner/operator to protect the facility to at least the 0.2% chance flood level
Action Number:	
WestWhitelandT-10	
Location (address, lat/long)	
	201 Miller Way
Mitigation Technique Category	
	Education and Awareness Programs (EAP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal FPA
Support Agency(ies)/ Department(s)	
	DES, LEPC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Work with power company to protect West Whiteland - S Whitford Road Electrical Substation to the 0.2% annual chance flood event.
Action Number:	
WestWhitelandT-11	
<i>Location (address, lat/long)</i>	149 S Whitford Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Municipal FPA
<i>Support Agency(ies)/ Department(s)</i>	Power Company
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
West Whiteland Township	Work with the property owners of the following facilities to determine what flood protection measures can be taken to protect them to the 0.2% annual chance flood level: Colebrook Manor, Exton Hotel, Thomas, John Roberts, Tennant Farmstead, Turnpike Station House, Whitford Station House, and William's Deluxe Cabins
Action Number:	
WestWhitelandT-12	
Location (address, lat/long)	
West Whiteland Township, multiple locations	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal FPA	
Support Agency(ies)/ Department(s)	
PHMC	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Acquire/elevate roadways/properties along Chester Creek - Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive
Action Number:	
WesttownT-1	
<i>Location (address, lat/long)</i>	Chester Creek – Skiles Blvd, Kolbe Lane, Piedmont Road, Tower Course Drive, Blenheim Road, Wood Lane, Westbourne Road, Westtown Road, Westtown Way, Ponds Edge Road, Diane Drive, Leslie Lane, Robin Drive
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	DES
<i>Support Agency(ies)/ Department(s)</i>	Municipal EMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Conduct a wildlands/forestry survey of township-owned forested areas, to determine need for strategies for mitigating invasive species risks.
Action Number:	
WesttownT-2	
<i>Location (address, lat/long)</i>	Westtown Township multiple locations
<i>Mitigation Technique Category</i>	Natural Systems Protection (NSP)
<i>Hazard(s) Addressed</i>	Invasive Species
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	Medium
<i>Potential Funding Streams</i>	FEMA HMGP, Westtown Township
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	Jon Altshul
<i>Title</i>	Township Manager
<i>Agency/Department</i>	Westtown Township
<i>Phone</i>	610-692-1930
<i>E-mail</i>	jaltshul@westtown.org



Municipality(ies):	Action
Westtown Township	Conduct flood mitigation analysis of the township WWTP on Westtown Road, and pump stations on Rt. 926 (Rustin) and Rt. 3 (Kirkwood)
Action Number:	
WesttownT-3	
Location (address, lat/long)	
	1492 Woodstone Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP
Timeline	
	Short
Lead Agency/Department	
	Westtown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	Jon Altshul
Title	Township Manager
Agency/Department	Westtown Township
Phone	610-692-1930
E-mail	jaltshul@westtown.org



Municipality(ies):	Action
Westtown Township	Develop/maintain a hazard risk management webpage on the municipal website where information and mapping can be posted.
Action Number:	
WesttownT-4	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Encourage regular offerings of the American Red Cross Citizen's Disaster Course and other relevant classes.
Action Number:	
WesttownT-5	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Enhance public outreach to residents in areas subject to flooding to inform them of annual grant opportunities; this may include distributing periodic articles and including handouts in the annual newsletter.
Action Number:	
WesttownT-6	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Work with PennDOT to conduct an assessment on how to improve design of Route 352/Rt. 3 intersection
Action Number:	
WesttownT-7	
Location (address, lat/long)	
	Route 352/Rt. 3
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Transportation Accidents
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	High
Potential Funding Streams	
	PennDOT, Municipal Budget
Timeline	
	Long
Lead Agency/Department	
	Westtown Township
Support Agency(ies)/ Department(s)	
	PennDOT
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Westtown Township	Work with PennDOT to conduct an assessment to improve the design of Route 202 at 926 intersection and High Street/202 merge
Action Number:	
WesttownT-8	
Location (address, lat/long)	
Route 202 at 926, High Street/202	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Transportation Accidents	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
High	
Potential Funding Streams	
PennDOT, Municipal Budget	
Timeline	
Long	
Lead Agency/Department	
Westtown Township	
Support Agency(ies)/ Department(s)	
PennDOT	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Westtown Township	Post flyers and other readily available informational materials at municipal hall or distribute at regular civic meetings.
Action Number:	
WesttownT-9	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Protect critical infrastructures (Schools, daycare, apartment buildings, and nursing home) on Rt. 202 around Skiles Blvd from HAZMAT transportation accidents
Action Number:	
WesttownT-10	
Location (address, lat/long)	
	Route 202
Mitigation Technique Category	
	Local Plans and Regulations (LPR)
Hazard(s) Addressed	
	Environment Hazards Hazardous Material Releases, Transportation Accidents
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC
Support Agency(ies)/ Department(s)	
	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Protect the following properties from a potential pipeline incident: Pipeline - Avonlea and Overhill neighborhoods, Sts. Simon and Jude Church and School (8 Cavanaugh Ct West Chester, PA 19382), Advent Lutheran Church at Green Lane on 352, Chesterfield Condominiums at Rt. 3 and 352
Action Number:	
WesttownT-11	
Location (address, lat/long)	
Avonlea and Overhill neighborhoods, 8 Cavanaugh Ct West Chester, PA 19382, Green Lane on 352, Rt. 3 and 352	
Mitigation Technique Category	
Local Plans and Regulations (LPR)	
Hazard(s) Addressed	
Environmental Hazard Gas and Liquid Pipelines	
Priority (High, Medium, Low)	
Medium	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Municipal EMC	
Support Agency(ies)/ Department(s)	
DES	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Protect the Westtown Wastewater Treatment Plant from dam failure and to the 0.2% annual chance flood level.
Action Number:	
WesttownT-12	
Location (address, lat/long)	
	950 Westtown Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam, Dam Failure
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Westtown Township	Provide general hazard risk preparedness and mitigation information in regular newsletters and mailings.
Action Number:	
WesttownT-13	
<i>Location (address, lat/long)</i>	N/A
<i>Mitigation Technique Category</i>	Education and Awareness Programs (EAP)
<i>Hazard(s) Addressed</i>	All Hazards
<i>Priority (High, Medium, Low)</i>	High
<i>Estimated Cost</i>	Low
<i>Potential Funding Streams</i>	Operating Budget
<i>Timeline</i>	Short
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Work with PennDOT to redesign of the 926 intersection, elimination of the East Pleasant Grove Road/Rt. 202 connection, further improvements to the Skiles Road intersection, High Street/202 Northbound merge
Action Number:	
WesttownT-14	
<i>Location (address, lat/long)</i>	East Pleasant Grove Road/Rt. 202, Skiles Road intersection, High Street/202 Northbound, Route 926
<i>Mitigation Technique Category</i>	Structure and infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Transportation Accidents
<i>Priority (High, Medium, Low)</i>	Low
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	PennDOT, Municipal Budget
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Westtown Township
<i>Support Agency(ies)/ Department(s)</i>	PennDOT
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Work with PennDOT to redesign the intersection of SR 926 and Avonlea Circle and Tanguy Road to improve line of sight.
Action Number:	
WesttownT-15	
Location (address, lat/long)	
SR 926 and Avonlea Circle and Tanguy Road	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
transportation Accidents	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
High	
Potential Funding Streams	
PennDOT, Municipal Budget	
Timeline	
Long	
Lead Agency/Department	
Westtown Township	
Support Agency(ies)/ Department(s)	
PennDOT	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Westtown Township	Retrofit WWTP on Westtown Road, Pump Stations at Kirkwood Highway and Rustin H.S.
Action Number:	
WesttownT-16	
<i>Location (address, lat/long)</i>	Westtown Road
<i>Mitigation Technique Category</i>	Structure and Infrastructure Project (SIP)
<i>Hazard(s) Addressed</i>	Flood, Flash Flood, and Ice Jam
<i>Priority (High, Medium, Low)</i>	Medium
<i>Estimated Cost</i>	High
<i>Potential Funding Streams</i>	FEMA HMGP, BRIC, FMA; PA DCED FMP
<i>Timeline</i>	Long
<i>Lead Agency/Department</i>	Municipal EMC, FPA
<i>Support Agency(ies)/ Department(s)</i>	DES
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Westtown Township	Work with the County Bridge No. 148 owner to determine what flood protection measures can be taken to protect it to the 0.2% annual chance flood level.
Action Number:	
WesttownT-17	
Location (address, lat/long)	
	Street Road
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Medium
Estimated Cost	
	High
Potential Funding Streams	
	Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Municipal EMC, FPA
Support Agency(ies)/ Department(s)	
	PHMC
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Willistown Township	Elevation/Acquisition of the structure located at 1 Eisenhower Dr
Action Number:	
Willistown T-1	
Location (address, lat/long)	
	1 Eisenhower Dr
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Medium
Estimated Cost	High
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	Long
Lead Agency/Department	Municipal FPA
Support Agency(ies)/ Department(s)	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Elevation/Acquisition of the structure located at 116 Davis Rd
Action Number:	
WillistownT-2	
Location (address, lat/long)	
	116 Davis Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Medium
Estimated Cost	High
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP, Operating Budget
Timeline	Long
Lead Agency/Department	Municipal FPA
Support Agency(ies)/ Department(s)	DES
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Emergency alerting systems for Willistown Township
Action Number:	
WillistownT-3	
Location (address, lat/long)	
N/A	
Mitigation Technique Category	
Structure and Infrastructure Project (SIP)	
Hazard(s) Addressed	All Hazards
Priority (High, Medium, Low)	Low
Estimated Cost	Low
Potential Funding Streams	FEMA, PEMA, Regional and Local Grants and Municipal Funds
Timeline	Short
Lead Agency/Department	Willistown Township/EMC
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Increase Culvert Size on Hillview Rd between Fox Chase and Bar Rd
Action Number:	
WillistownT-4	
Location (address, lat/long)	
	Hillview Rd between Fox Chase and Bar Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Capital Improvement Budget
Timeline	
	Short
Lead Agency/Department	
	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Increase drainage basin size at Rustmont Homeowners Association
Action Number:	
WillistownT-5	
Location (address, lat/long)	
	Rustmont Homeowners Association
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Willistown Township	Increase drainage basin size behind Malvern Fire Company
Action Number:	
WillistownT-6	
Location (address, lat/long)	
	Malvern Fire Company
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	Medium
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	Short
Lead Agency/Department	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Increase drainage basin size of the Family Life Basin
Action Number:	
WillistownT-7	
Location (address, lat/long)	
	Family Life Basin
Mitigation Technique Category	
	Structure and Infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Increase size of drainage pipe crossing under road at Paoli Pike west of Rustin Ln and Devon Rd
Action Number:	
WillistownT8	
Location (address, lat/long)	
	Paoli Pike west of Rustin Lane and Devon Road
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	Medium
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
<i>Name</i>	
<i>Title</i>	
<i>Agency/Department</i>	
<i>Phone</i>	
<i>E-mail</i>	



Municipality(ies):	Action
Willistown Township	Install gates to be closed during flood incidents and signage on Jaffery Rd over Crum Creek
Action Number:	
WillistownT-9	
Location (address, lat/long)	
Jaffery Rd over Crum Creek	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
High	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC; Operating Budget	
Timeline	
Short	
Lead Agency/Department	
Willistown Township	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Install gates to be closed during flood incidents and signage on Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd
Action Number:	
WillistownT-10	
Location (address, lat/long)	
	Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	High
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC; Operating Budget
Timeline	
	Short
Lead Agency/Department	
	Willistown Township
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Strengthen Bridge/Re-engineer bridge approaches at Jaffery Rd over Crum Creek
Action Number:	
WillistownT-11	
Location (address, lat/long)	
Jaffery Rd over Crum Creek	
Mitigation Technique Category	
Structure and infrastructure Project (SIP)	
Hazard(s) Addressed	
Flood, Flash Flood, and Ice Jam	
Priority (High, Medium, Low)	
Low	
Estimated Cost	
High	
Potential Funding Streams	
FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget	
Timeline	
Long	
Lead Agency/Department	
DPW	
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Davis Rd and Fox Chase Rd
Action Number:	
WillistownT-12	
Location (address, lat/long)	
	Whitehorse Rd between Davis Rd and Fox Chase Rd
Mitigation Technique Category	
	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	
	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	
	Low
Estimated Cost	
	High
Potential Funding Streams	
	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	
	Long
Lead Agency/Department	
	DPW
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	



Municipality(ies):	Action
Willistown Township	Strengthen Bridge/Re-engineer bridge approaches at Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd
Action Number:	
WillistownT-13	
Location (address, lat/long)	
Whitehorse Rd between Rabbit Run Rd and Grubbs Mill Rd	
Mitigation Technique Category	Structure and infrastructure Project (SIP)
Hazard(s) Addressed	Flood, Flash Flood, and Ice Jam
Priority (High, Medium, Low)	Low
Estimated Cost	High
Potential Funding Streams	FEMA HMGP, BRIC, FMA; PA DCED FMP; Operating Budget
Timeline	Long
Lead Agency/Department	DPW
Support Agency(ies)/ Department(s)	
Project Point of Contact	
Name	
Title	
Agency/Department	
Phone	
E-mail	

**CRITICAL FACILITIES****Essential Facilities****Municipal Facilities****Table I-1. Municipal Facilities in Chester County**

Name	Address	Municipality	Bldg. Type
313 W Market St Building	313 W Market St	West Chester (B)	County Building
Justice Center	201 W Market St	West Chester (B)	County Building
Government Services Center	601 Westtown Rd	West Goshen (T)	County Building
Atglen Borough Building	120 Main St	Atglen (B)	Municipal Building
Avondale Borough Building	110 Pomeroy Av	Avondale (B)	Municipal Building
Birmingham Township Building	1040 W Street Rd	Birmingham (T)	Municipal Building
Caln Township Building	253 Municipal Dr	Caln (T)	Municipal Building
Charlestown Township Building	4030 Whitehorse Rd	Charlestown (T)	Municipal Building
Coatesville City Building	1 City Hall Pl	Coatesville (C)	Municipal Building
Downingtown Borough Building	4 W Lancaster Av	Downingtown (B)	Municipal Building
East Bradford Township Building	666 Copeland School Rd	East Bradford (T)	Municipal Building
East Brandywine Township Building	1214 Horseshoe Pk	East Brandywine (T)	Municipal Building
East Caln Township Building	110 Bell Tavern	East Caln (T)	Municipal Building
East Coventry Township Building	855 Ellis Woods Rd	East Coventry (T)	Municipal Building
East Fallowfield Township Building	2264 Strasburg Rd	East Fallowfield (T)	Municipal Building
East Goshen Township Building	1580 Paoli Pk	East Goshen (T)	Municipal Building
East Marlborough Township Building	721 Unionville St	East Marlborough (T)	Municipal Building
East Nantmeal Township Building	3383 Conestoga Rd	East Nantmeal (T)	Municipal Building
East Nottingham Township Building	156 Election Rd	East Nottingham (T)	Municipal Building
East Pikeland Township Building	1158 Rapps Dam Rd	East Pikeland (T)	Municipal Building
East Vincent Township Building	262 Ridge Rd	East Vincent (T)	Municipal Building
East Whiteland Township Building	209 Conestoga Rd	East Whiteland (T)	Municipal Building
Easttown Township Building	566 Beaumont Rd	Easttown (T)	Municipal Building
Elk Township Building	952 Chesterville Rd	Elk (T)	Municipal Building
Elverson Borough Building	101 Chestnut St	Elverson (B)	Municipal Building
Franklin Township Building	20 Municipal La	Franklin (T)	Municipal Building
Highland Township Building	100 N Five Points Rd	Highland (T)	Municipal Building
Honey Brook Borough Building	91 Pequa Av	Honey Brook (B)	Municipal Building
Honey Brook Township Building	495 Suplee Rd	Honey Brook (T)	Municipal Building
Kennett Township Building	1001 E Baltimore Pk	Kennett (T)	Municipal Building
Kennett Square Borough Building	115 N Broad St	Kennett Square (B)	Municipal Building
London Britain Township Building	81 Good Hope Rd	London Britain (T)	Municipal Building
London Grove Township Building	364 Rosehill Rd	London Grove (T)	Municipal Building
Londonderry Township Building	103 Daleville Rd	Londonderry (T)	Municipal Building



Name	Address	Municipality	Bldg. Type
Lower Oxford Township Building	220 Township Rd	Lower Oxford (T)	Municipal Building
Malvern Borough Building	1 E First Av	Malvern (B)	Municipal Building
Modena Borough Building	5 N Brandywine Av	Modena (B)	Municipal Building
New Garden Township Building	299 Starr Rd	New Garden (T)	Municipal Building
New London Township Building	902 State Rd	New London (T)	Municipal Building
Newlin Township Building	1751 Embreeville Rd	Newlin (T)	Municipal Building
North Coventry Township Building	845 S Hanover St	North Coventry (T)	Municipal Building
Oxford Borough Building	401 Market St	Oxford (B)	Municipal Building
Parkesburg Borough Building	329 W First Av	Parkesburg (B)	Municipal Building
Penn Township Building	260 Lewis Rd	Penn (T)	Municipal Building
Pennsbury Township Building	702 Baltimore Pk	Pennsbury (T)	Municipal Building
Phoenixville Borough Building	177 Church St	Phoenixville (B)	Municipal Building
Pocopson Township Building	740 Denton Hollow Rd	Pocopson (T)	Municipal Building
Sadsbury Township Building	2920 Lincoln Hwy	Sadsbury (T)	Municipal Building
Schuylkill Township Building	111 Valley Park Rd	Schuylkill (T)	Municipal Building
South Coatesville Borough Building	136 Modena Rd	South Coatesville (B)	Municipal Building
South Coventry Township Building	1002 Ridge Rd	South Coventry (T)	Municipal Building
Spring City Borough Building	6 S Church St	Spring City (B)	Municipal Building
Tredyffrin Township Building	1100 Duportail Rd	Tredyffrin (T)	Municipal Building
Upper Oxford Township Building	1185 Limestone Rd	Upper Oxford (T)	Municipal Building
Upper Uwchlan Township Building	140 Pottstown Pk	Upper Uwchlan (T)	Municipal Building
Uwchlan Township Building	715 N Ship Rd	Uwchlan (T)	Municipal Building
Valley Township Building	890 W Lincoln Hwy	Valley (T)	Municipal Building
Wallace Township Building	451 Fairview Rd	Wallace (T)	Municipal Building
Warwick Township Building	2500 Ridge Rd	Warwick (T)	Municipal Building
West Bradford Township Building	1385 Campus Dr	West Bradford (T)	Municipal Building
West Brandywine Township Building	199 Lafayette Rd	West Brandywine (T)	Municipal Building
West Caln Township Building	412 W Kings Hwy	West Caln (T)	Municipal Building
West Chester Borough Building	401 E Gay St	West Chester (B)	Municipal Building
West Fallowfield Township Building	3095 Limestone Rd	West Fallowfield (T)	Municipal Building
West Goshen Township Building	1025 Paoli Pk	West Goshen (T)	Municipal Building
West Grove Borough Building	117 Rosehill Av	West Grove (B)	Municipal Building
West Marlborough Township Building	1300 Doe Run Rd	West Marlborough (T)	Municipal Building
West Nantmeal Township Building	455 N Manor Rd	West Nantmeal (T)	Municipal Building
West Nottingham Township Building	100 Park Rd	West Nottingham (T)	Municipal Building
West Pikeland Township Building	1208 E Kimerton Rd	West Pikeland (T)	Municipal Building
West Sadsbury Township Building	6400 N Moscow Rd	West Sadsbury (T)	Municipal Building
West Vincent Township Building	729 Saint Matthews Rd	West Vincent (T)	Municipal Building
West Whiteland Township Building	101 Commerce Dr	West Whiteland (T)	Municipal Building
Westtown Township Building	1039 Wilmington Pk	Westtown (T)	Municipal Building
Willistown Township Building	686 Sugartown Rd	Willistown (T)	Municipal Building

Source: Chester County





Emergency Facilities

Table I-2. Emergency Facilities in Chester County

Name	Address	Municipality	Bldg. Type
BWH Medic Unit	201 Reeceville Rd	Caln (T)	EMS Station
Coatesville VA Ambulance	1400 Blackhorse Hill Rd	Caln (T)	EMS Station
ArcelorMittal Emergency Services	17 Rolling Mills Dr	Coatesville (C)	EMS Station
Washington Hose Ambulance	376 E Lincoln Hwy	Coatesville (C)	EMS Station
Minquas Ambulance	141 Wallace Av	Downingtown (B)	EMS Station
Good Fellowship Ambulance (Sub-Station)	961 DOWNINGTOWN PK	East Bradford (T)	EMS Station
Good Fellowship Ambulance (Sub-Station)	1311 WEST CHESTER PK	East Goshen (T)	EMS Station
Goshen Ambulance	1320 Park Av	East Goshen (T)	EMS Station
East Whiteland Ambulance	205 Conestoga RD	East Whiteland (T)	EMS Station
Malvern Ambulance (Substation) Medic Unit	205 Conestoga RD	East Whiteland (T)	EMS Station
Berwyn Ambulance	23 Bridge Av	Easttown (T)	EMS Station
Elverson - Honey Brook Area EMS (Substation)	671 Firehouse La	Honey Brook (B)	EMS Station
Longwood Ambulance	1001 E Baltimore Pk	Kennett (T)	EMS Station
Kennett Ambulance	301 Dalmatian La	Kennett Square (B)	EMS Station
Malvern Ambulance	424 E King St	Malvern (B)	EMS Station
Modena Ambulance	5 N Brandywine Av	Modena (B)	EMS Station
Avondale Ambulance	23 Firehouse Wy	New Garden (T)	EMS Station
West Grove Ambulance (Substation)	1 Firehouse La	New London (T)	EMS Station
Union FC Ambulance	315 Market St	Oxford (B)	EMS Station
Keystone Valley Ambulance	329 W First Av	Parkesburg (B)	EMS Station
SCCMC Med Unit	1015 W Baltimore Pk	Penn (T)	EMS Station
Trapp EMS	177 Church St	Phoenixville (B)	EMS Station
West End Ambulance Phoenixville	801 W Bridge St	Phoenixville (B)	EMS Station
Berwyn Ambulance (Sub-Station)	1027 N VALLEY FORGE RD	Tredyffrin (T)	EMS Station
Paoli Ambulance	69 Darby Rd	Tredyffrin (T)	EMS Station
Uwchlan Ambulance	70 W Welsh Pool Rd	Uwchlan (T)	EMS Station
Westwood Ambulance	1403 Valley Rd	Valley (T)	EMS Station
Westwood Ambulance (Substation)	412 W Kings Hwy	West Caln (T)	EMS Station
CCH Medic Unit	701 E Marshall St	West Chester (B)	EMS Station
Good Fellowship Ambulance	600 Montgomery Av	West Goshen (T)	EMS Station
Goshen Ambulance (Substation)	1299 Boot Rd	West Goshen (T)	EMS Station
West Grove Ambulance	101 Walnut St	West Grove (B)	EMS Station
Uwchlan Ambulance (Substation)	227 Crest Av	West Whiteland (T)	EMS Station
Atglen Borough	120 Main St	Atglen (B)	EOC
Avondale Borough EOC	110 Pomeroy Av	Avondale (B)	EOC
Birmingham Township EOC	1040 W Street Rd	Birmingham (T)	EOC
Caln Township EOC	253 Municipal Dr	Caln (T)	EOC
Charlestown Township EOC	4030 Whitehorse Rd	Charlestown (T)	EOC
Coatesville City EOC	1 City Hall Pl	Coatesville (C)	EOC
Downingtown Borough EOC	4 W Lancaster Av	Downingtown (B)	EOC



Name	Address	Municipality	Bldg. Type
East Bradford Township EOC	666 Copeland School Rd	East Bradford (T)	EOC
East Brandywine Township EOC	1214 Horseshoe Pk	East Brandywine (T)	EOC
East Caln Township EOC	110 Bell Tavern	East Caln (T)	EOC
East Coventry Township EOC	855 Ellis Woods Rd	East Coventry (T)	EOC
East Fallowfield Township EOC	2264 Strasburg Rd	East Fallowfield (T)	EOC
East Goshen Township EOC	1580 Paoli Pk	East Goshen (T)	EOC
East Marlborough Township EOC	721 Unionville St	East Marlborough (T)	EOC
East Nantmeal Township EOC	3383 Conestoga Rd	East Nantmeal (T)	EOC
East Nottingham Township EOC	156 Election Rd	East Nottingham (T)	EOC
East Pikeland Township EOC	1158 Rapps Dam Rd	East Pikeland (T)	EOC
East Vincent Township EOC	262 Ridge Rd	East Vincent (T)	EOC
East Whiteland Township EOC	209 Conestoga Rd	East Whiteland (T)	EOC
Easttown Township EOC	566 Beaumont Rd	Easttown (T)	EOC
Elk Township EOC	952 Chesterville Rd	Elk (T)	EOC
Elverson Borough EOC	101 Chestnut St	Elverson (B)	EOC
Franklin Township EOC	20 Municipal La	Franklin (T)	EOC
Highland Township EOC	100 N Five Points Rd	Highland (T)	EOC
Honey Brook Borough EOC	91 Pequa Av	Honey Brook (B)	EOC
Honey Brook Township EOC	495 Suplee Rd	Honey Brook (T)	EOC
Kennett Township EOC	1001 E Baltimore Pk	Kennett (T)	EOC
Kennett Square Borough EOC	115 N Broad St	Kennett Square (B)	EOC
London Britain Township EOC	81 Good Hope Rd	London Britain (T)	EOC
London Grove Township EOC	364 Rosehill Rd	London Grove (T)	EOC
Londonderry Township EOC	103 Daleville Rd	Londonderry (T)	EOC
Lower Oxford Township EOC	220 Township Rd	Lower Oxford (T)	EOC
Malvern Borough EOC	1 E First Av	Malvern (B)	EOC
Modena Borough EOC	5 N Brandywine Av	Modena (B)	EOC
New Garden Township EOC	299 Starr Rd	New Garden (T)	EOC
New London Township EOC	902 State Rd	New London (T)	EOC
Newlin Township EOC	1751 Embreeville Rd	Newlin (T)	EOC
North Coventry Township EOC	845 S Hanover St	North Coventry (T)	EOC
Oxford Borough EOC	401 Market St	Oxford (B)	EOC
Parquesburg Borough EOC	329 W First Av	Parquesburg (B)	EOC
Penn Township EOC	260 Lewis Rd	Penn (T)	EOC
Pennsbury Township EOC	702 Baltimore Pk	Pennsbury (T)	EOC
Phoenixville Borough EOC	177 Church St	Phoenixville (B)	EOC
Pocopson Township EOC	740 Denton Hollow Rd	Pocopson (T)	EOC
Sadsbury Township EOC	2920 Lincoln Hwy	Sadsbury (T)	EOC
Schuylkill Township EOC	111 Valley Park Rd	Schuylkill (T)	EOC
South Coatesville Borough EOC	136 Modena Rd	South Coatesville (B)	EOC
South Coventry Township EOC	1002 Ridge Rd	South Coventry (T)	EOC
Spring City Borough EOC	6 S Church St	Spring City (B)	EOC
Tredyffrin Township EOC	1100 Duportail Rd	Tredyffrin (T)	EOC
Upper Oxford Township EOC	1185 Limestone Rd	Upper Oxford (T)	EOC
Upper Uwchlan Township EOC	140 Pottstown Pk	Upper Uwchlan (T)	EOC
Uwchlan Township EOC	715 N Ship Rd	Uwchlan (T)	EOC
Valley Township EOC	890 W Lincoln Hwy	Valley (T)	EOC
Wallace Township EOC	451 Fairview Rd	Wallace (T)	EOC
Warwick Township EOC	2500 Ridge Rd	Warwick (T)	EOC
West Bradford Township EOC	1385 Campus Dr	West Bradford (T)	EOC
West Brandywine Township EOC	199 Lafayette Rd	West Brandywine (T)	EOC
West Caln Township EOC	412 W Kings Hwy	West Caln (T)	EOC



Name	Address	Municipality	Bldg. Type
West Chester Borough EOC	401 E Gay St	West Chester (B)	EOC
West Chester University EOC	690 S Church St	West Chester (B)	EOC
West Fallowfield Township EOC	3095 Limestone Rd	West Fallowfield (T)	EOC
Chester County EOC	601 Westtown Rd	West Goshen (T)	EOC
West Goshen Township EOC	1025 Paoli Pk	West Goshen (T)	EOC
West Grove Borough EOC	117 Rosehill Av	West Grove (B)	EOC
West Marlborough Township EOC	1300 Doe Run Rd	West Marlborough (T)	EOC
West Nantmeal Township EOC	455 N Manor Rd	West Nantmeal (T)	EOC
West Nottingham Township EOC	100 Park Rd	West Nottingham (T)	EOC
West Pikeland Township EOC	1208 E Kimerton Rd	West Pikeland (T)	EOC
West Sadsbury Township EOC	6400 N Moscow Rd	West Sadsbury (T)	EOC
West Vincent Township EOC	729 Saint Matthews Rd	West Vincent (T)	EOC
West Whiteland Township EOC	101 Commerce Dr	West Whiteland (T)	EOC
Westtown Township EOC	1039 Wilmington Pk	Westtown (T)	EOC
Willistown Township EOC	686 Sugartown Rd	Willistown (T)	EOC
Coatesville VA FD	1400 Blackhorse Hill Rd	Caln (T)	Fire Station
Thorndale FC	3611 Lincoln Hwy	Caln (T)	Fire Station
ArcelorMittal Emergency Services	17 Rolling Mills Dr	Coatesville (C)	Fire Station
Washington Hose	376 E Lincoln Hwy	Coatesville (C)	Fire Station
West End FC Coatesville	134 Strode Av	Coatesville (C)	Fire Station
Alert FC	122 W Pennsylvania Av	Downingtown (B)	Fire Station
Minquas FC	141 Wallace Av	Downingtown (B)	Fire Station
First West Chester FC	70 S Bradford Av	East Bradford (T)	Fire Station
East Brandywine FC	2096 Bondsville Rd	East Brandywine (T)	Fire Station
Ridge FC	480 Ridge Rd	East Coventry (T)	Fire Station
Goshen FC	1320 Park Av	East Goshen (T)	Fire Station
Po-Mar-Lin FC	36 Firehouse Dr	East Marlborough (T)	Fire Station
Kimberton FC	61 Firehouse La	East Pikeland (T)	Fire Station
East Whiteland FC	2050 Conestoga Rd	East Whiteland (T)	Fire Station
Berwyn FC	23 Bridge Av	Easttown (T)	Fire Station
Honey Brook FC	679 Firehouse La	Honey Brook (B)	Fire Station
Longwood FC	1001 E Baltimore Pk	Kennett (T)	Fire Station
Kennett FC	301 Dalmatian La	Kennett Square (B)	Fire Station
West Grove FC (Substation)	1517 New London Rd	London Britain (T)	Fire Station
Malvern FC	424 E King St	Malvern (B)	Fire Station
Modena FC	5 N Brandywine Av	Modena (B)	Fire Station
Avondale FC	23 Firehouse Wy	New Garden (T)	Fire Station
West Grove FC (Substation)	1 Firehouse La	New London (T)	Fire Station
Norco FC	144 W Schuylkill Rd	North Coventry (T)	Fire Station
Union FC	315 Market St	Oxford (B)	Fire Station
Keystone Valley FD Central	329 W First Av	Parkesburg (B)	Fire Station
Phoenixville FD	177 Church St	Phoenixville (B)	Fire Station
Keystone Valley FD East	1918 Valley Rd	Sadsbury (T)	Fire Station
Sadsburyville Fire Co	24 First Ave	Sadsbury (T)	Fire Station
Sikorsky Aircraft FC	110 E Stewart Huston Dr	Sadsbury (T)	Fire Station



Name	Address	Municipality	Bldg. Type
Valley Forge FC	630 Valley Park Rd	Schuylkill (T)	Fire Station
Valley Forge FC (Substation)	300 W Pothouse Rd	Schuylkill (T)	Fire Station
Liberty FC	20 S Main St	Spring City (B)	Fire Station
Paoli FC	69 Darby Rd	Tredyffrin (T)	Fire Station
Lionville FC	11 S Village Av	Uwchlan (T)	Fire Station
Westwood FC	1403 Valley Rd	Valley (T)	Fire Station
Glenmoore FC	578 Fairview Rd	Wallace (T)	Fire Station
West Bradford FC	1305 W Strasburg Rd	West Bradford (T)	Fire Station
West Bradford FC (Substation)	1381 Campus Dr	West Bradford (T)	Fire Station
Wagontown FC	412 W Kings Hwy	West Caln (T)	Fire Station
Good Will FC	552 E Union St	West Chester (B)	Fire Station
Cochranville FC	3135 Limestone Rd	West Fallowfield (T)	Fire Station
CC Haz-Mat Team	601 Westtown Rd	West Goshen (T)	Fire Station
Fame FC	200 E Rosedale Av	West Goshen (T)	Fire Station
Goshen FC (Substation)	1299 Boot Rd	West Goshen (T)	Fire Station
West Grove FC	101 Walnut St	West Grove (B)	Fire Station
Union FC (Substation)	527 E Christine Rd	West Nottingham (T)	Fire Station
Ludwigs Corner	1325 Pottstown Pk	West Vincent (T)	Fire Station
West Whiteland FC	227 Crest Av	West Whiteland (T)	Fire Station
Atglen (Covered by Christiana)	120 Main St	Atglen (B)	Police Station
Avondale (Covered by Parkesburg)	110 Pomeroy Av	Avondale (B)	Police Station
Birmingham Twp PD	1040 W Street Rd	Birmingham (T)	Police Station
Caln Twp PD	253 Municipal Dr	Caln (T)	Police Station
Coatesville City PD	1 City Hall Pl	Coatesville (C)	Police Station
Downingtown Boro PD	10 W Lancaster Av	Downingtown (B)	Police Station
East Brandywine PD	1212 Horseshoe Pk	East Brandywine (T)	Police Station
East Coventry Twp PD	855 Ellis Woods Rd	East Coventry (T)	Police Station
East Fallowfield Twp PD	475 Doe Run Rd	East Fallowfield (T)	Police Station
East Marlborough Twp PD	721 Unionville Rd	East Marlborough (T)	Police Station
East Pikeland Twp PD	1158 Rapps Dam Rd	East Pikeland (T)	Police Station
East Vincent Twp PD	262 Ridge Rd	East Vincent (T)	Police Station
East Whiteland Twp PD	209 Conestoga Rd	East Whiteland (T)	Police Station
Easttown Twp PD	566 Beaumont Rd	Easttown (T)	Police Station
Highland Twp PD (Covered by Parkesburg)	100 Five Points Rd	Highland (T)	Police Station
Honey Brook Borough PD	91 Pequea Av	Honey Brook (B)	Police Station
Kennett Twp PD	801 Burrows Run Rd	Kennett (T)	Police Station
Kennett Square PD	115 N Broad St	Kennett Square (B)	Police Station
PA State Police - Avondale	2 Moxley La	London Grove (T)	Police Station
Malvern Boro PD	1 E First Av	Malvern (B)	Police Station
Southern Chester County Regional PD	835 Starr Rd	New Garden (T)	Police Station
North Coventry Twp PD	845 S Hanover St	North Coventry (T)	Police Station
Oxford Boro PD	57 N Fourth St	Oxford (B)	Police Station



Name	Address	Municipality	Bldg. Type
Parkesburg Boro PD	315 W First Av	Parkesburg (B)	Police Station
Phoenixville Boro PD	351 Bridge St	Phoenixville (B)	Police Station
Sadsbury Twp PD	2920 Lincoln Hwy	Sadsbury (T)	Police Station
Schuylkill Twp PD	111 Valley Park Rd	Schuylkill (T)	Police Station
South Coatesville Boro PD	134 Modena Rd	South Coatesville (B)	Police Station
Spring City Boro PD	6 S Church St	Spring City (B)	Police Station
Upper Uwchlan Twp PD	140 Pottstown Pk	Upper Uwchlan (T)	Police Station
Uwchlan Twp PD	715 N Ship Rd	Uwchlan (T)	Police Station
Valley Twp PD	890 W Lincoln Hwy	Valley (T)	Police Station
PA State Police - Embreeville	997 W Lieds Rd	West Bradford (T)	Police Station
West Brandywine Twp PD	198 Lafayette Rd	West Brandywine (T)	Police Station
West Caln Twp PD	721 W Kings Hwy	West Caln (T)	Police Station
West Chester Boro PD	401 E Gay St	West Chester (B)	Police Station
West Fallowfield Twp PD	3095 Limestone Rd	West Fallowfield (T)	Police Station
West Goshen Twp PD	1025 Paoli Pk	West Goshen (T)	Police Station
West Grove Boro PD	117 Rosehill Av	West Grove (B)	Police Station
West Nottingham Twp PD	100 Park Rd	West Nottingham (T)	Police Station
West Pikeland Twp PD	1649 Art School Rd	West Pikeland (T)	Police Station
West Sadsbury Twp PD	4119 W Lincoln Hwy	West Sadsbury (T)	Police Station
West Vincent Twp PD	729 Saint Matthews Rd	West Vincent (T)	Police Station
West Whiteland Twp PD	101 Commerce Dr	West Whiteland (T)	Police Station
Westtown/E Goshen PD	1041 Wilmington Pk	Westtown (T)	Police Station
Willistown Twp PD	688 Sugartown Rd	Willistown (T)	Police Station

Source: Chester County

Notes:

EOC Emergency Operation Center

FD Fire department

PD Police department

Hospital and Medical Centers

Table I-3. Hospitals and Medical Centers in Chester County

Name	Address	Municipality	# Beds	Bldg. Type
Chester County Health Department	601 Westtown Rd	West Goshen (T)	N/A	Health Department
Brandywine Hospital	201 Reeceville Rd	Caln (T)	Unknown	Hospital
St John Vianney Hospital	151 Woodbine Rd	Downingtown (B)	Unknown	Hospital
Jennersville Regional Hospital	1015 W Baltimore Pk	Penn (T)	Unknown	Hospital
Phoenixville Hospital	140 Nutt Rd	Phoenixville (B)	Unknown	Hospital
Chester County Hospital	701 E Marshall St	West Chester (B)	Unknown	Hospital
LifeCare Hospitals of Chester County	400 East Marshal Street	West Chester (B)	Unknown	Hospital
Bryn Mawr Rehab Hospital	414 Paoli Pk	Willistown (T)	Unknown	Hospital
Devereux Children's Behavioral Health Ctr	655 Sugartown Rd	Willistown (T)	Unknown	Hospital
Paoli Memorial Hospital	255 W Lancaster Av	Willistown (T)	Unknown	Hospital
VA Medical Center - Coatesville	1400 Blackhorse Hill Rd	Caln (T)	Unknown	Intermediate Care



Name	Address	Municipality	# Beds	Bldg. Type
Devereux Pa Adult Services - Fareforth	51 Leopard Road	Easttown (T)	Unknown	Intermediate Care
Devereux Pa Adult Services - Spruce	806 Maple Avenue	Easttown (T)	Unknown	Intermediate Care
Devereux Pa Adult Services - Country Club	755 Country Club Road	Schuylkill (T)	Unknown	Intermediate Care
Devereux Pa Adult Services - Meadowcroft	875 Meadowcroft Road	Thornbury (T)	Unknown	Intermediate Care
Devereux Pa Adult Services - Rose Villa	1300 Ship Road	West Whiteland (T)	Unknown	Intermediate Care

Source: Chester County

Schools

Table I-4. Schools in Chester County

Name	Address	Municipality	Bldg. Type
Delaware Co Community College-Downingtown Campus	100 Bond Dr	East Brandywine (T)	Higher Education
Immaculata University	1145 King Rd	East Whiteland (T)	Higher Education
Penn State-Great Valley Campus	30 E Swedesford Rd	East Whiteland (T)	Higher Education
Lincoln University	1570 Baltimore Pk	Lower Oxford (T)	Higher Education
University of Valley Forge	1401 Charlestown Rd	Schuylkill (T)	Higher Education
Cheyney University	1837 University Cr	Thornbury (T)	Higher Education
West Chester University	100 W Rosedale Av	West Chester (B)	Higher Education
West Chester University Graduate Business Center	1160 McDermott Dr	West Goshen (T)	Higher Education
West Chester University-South Campus	855 S New St	West Goshen (T)	Higher Education
Delaware County Community College-Exton Campus	912 Springdale Dr	West Whiteland (T)	Higher Education
International Montessori School at Dilworthtown	1385 Birmingham Rd	Birmingham (T)	School
Caln Elementary School	3609 E Lincoln Hwy	Caln (T)	School
CCIU Learning Center	1525 E Lincoln Hwy	Caln (T)	School
Child & Career Development Career	1530 E Lincoln Highway	Caln (T)	School
Coatesville Area Intermediate High School	1425 Lincoln Hwy	Caln (T)	School
Coatesville Area Senior High School	1445 Lincoln Hwy	Caln (T)	School
Copeland Run Academy	407 Lloyd Av	Caln (T)	School
Downingtown Middle School	115 Rock Raymond Rd	Caln (T)	School
Head Start (SKL)	1530 E Lincoln Highway	Caln (T)	School
Charlestown Elementary School	2060 Charlestown Rd	Charlestown (T)	School
Charlestown Playhouse	2478 Charlestown Rd	Charlestown (T)	School
KinderCare	65 General Warren Bl	Charlestown (T)	School
CFS, The School at Church Farm	1001 E Lincoln Hwy	Coatesville (C)	School
Coatesville Area Catholic Middle School	17 N Church St	Coatesville (C)	School
Coatesville Head Start	351 Kersey St	Coatesville (C)	School
Maranatha Christian Academy	245 E Lincoln Av	Coatesville (C)	School
Scott Middle School	800 Olive St	Coatesville (C)	School
St. Joseph's Elementary School	406 Charles St	Coatesville (C)	School



Name	Address	Municipality	Bldg. Type
Beaver Creek Elementary School	601 Pennsylvania Av	Downingtown (B)	School
Bishop Shanahan High School	220 Woodbine Rd	Downingtown (B)	School
Downingtown Head Start (TCHS-B)	455 Boot Rd	Downingtown (B)	School
Downingtown High School West	445 Manor Av	Downingtown (B)	School
East Ward Elementary School	435 Washington Av	Downingtown (B)	School
Lori Petrie's Pre School	121 Manor Av	Downingtown (B)	School
Regina Luminis Academy	40 W Pennsylvania Av	Downingtown (B)	School
St Joseph School	340 Manor Av	Downingtown (B)	School
STEM Academy	335 Manor Av	Downingtown (B)	School
Step By Step Children's House	703 E Lancaster Av	Downingtown (B)	School
Step By Step Children's House	122 W Pennsylvania Av	Downingtown (B)	School
Technical College High School - Brandywine Campus	443 W Boot Rd	Downingtown (B)	School
East Bradford Elementary School	820 Frank Rd	East Bradford (T)	School
Goddard School	703 W Nields St	East Bradford (T)	School
Hillsdale Elementary School	725 W Market St	East Bradford (T)	School
Brandywine Wallace Elementary School	435 Dilworth Rd	East Brandywine (T)	School
Devereux CARES	600 Boot Rd	East Caln (T)	School
Devereux-Day School	520 Boot Rd	East Caln (T)	School
Collegeville Montessori Academy	952 Bethel Church Rd	East Coventry (T)	School
East Coventry Elementary School	2461 E Cedarville RD	East Coventry (T)	School
East Fallowfield Elementary School	2254 Strasburg Rd	East Fallowfield (T)	School
South Brandywine Middle School	600 Doe Run Rd	East Fallowfield (T)	School
East Goshen Elementary School	800 N Chester Rd	East Goshen (T)	School
Goshen Friends School	814 N Chester Rd	East Goshen (T)	School
PA Leadership Charter School	1332 Enterprise Dr	East Goshen (T)	School
Sts Peter And Paul School	1327 E Boot Rd	East Goshen (T)	School
Charles F. Patton Middle School	760 Unionville Rd	East Marlborough (T)	School
Unionville Elementary School	1775 W Doe Run Rd	East Marlborough (T)	School
Unionville High School	750 Unionville Rd	East Marlborough (T)	School
Upland Country Day School	420 W Street Rd	East Marlborough (T)	School
Camp Hill Special School Inc.	1784 Fairview Rd	East Nantmeal (T)	School
Camphill Soltane	224 Nantmeal Rd	East Nantmeal (T)	School
French Creek Elementary School	3590 Coventryville Rd	East Nantmeal (T)	School
Barnsley Academy	225 Barnsley Rd	East Nottingham (T)	School
Bethany Christian School	1137 Shadyside Rd	East Nottingham (T)	School
Hopewell Elementary School	602 Garfield Street	East Nottingham (T)	School
Oxford High School	705 Waterway Rd	East Nottingham (T)	School
Weaver Day School	1057 Little Elk Creek Rd	East Nottingham (T)	School
East Pikeland Elementary School	1191 Hares Hill Rd	East Pikeland (T)	School
St Basil the Great School	2330 Kimberton Rd	East Pikeland (T)	School
East Vincent Elementary School	340 Ridge Rd	East Vincent (T)	School
Kimberton Waldorf School	410 W Seven Stars Rd	East Vincent (T)	School
Spring City Elementary Hybrid Learning School	190 S Wall St	East Vincent (T)	School
Brandywine Children's House	123 Great Valley Pkwy	East Whiteland (T)	School
Building Blocks Childcare Center	9 South Bacton Hill Rd	East Whiteland (T)	School
Chesterbrook Academy	315 Technology Dr	East Whiteland (T)	School
Goddard School	250 Lancaster Ave	East Whiteland (T)	School
Great Valley High School	225 N Phoenixville Pk	East Whiteland (T)	School
Great Valley Middle School	255 N Phoenixville Pk	East Whiteland (T)	School
International Montessori School at Great Valley	75 Lancaster Av	East Whiteland (T)	School
Kathryn D Markley Elementary School	354 Swedesford Rd	East Whiteland (T)	School
Malvern School	383 Lancaster Av	East Whiteland (T)	School
Villa Maria Academy	1140 King Rd	East Whiteland (T)	School
Beaumont Elementary School	575 Beaumont Rd	Easttown (T)	School



Name	Address	Municipality	Bldg. Type
Berwyn Montessori School	719 Berwyn Av	Easttown (T)	School
Devereux- Fenstone Building/Whitlock	119 Old Lancaster Rd	Easttown (T)	School
Devereux-Stone & Gables	228 Highland Av	Easttown (T)	School
Devon Elementary School	400 S Fairfield Rd	Easttown (T)	School
Saint Monica	635 First Av	Easttown (T)	School
St Norbert School	6 Greenlawn Rd	Easttown (T)	School
Tarleton School	327 Waterloo Av	Easttown (T)	School
Trinity Nursery School	50 Main Av	Easttown (T)	School
Upper Main Line YMCA Early Learning Center	1416 Berwyn Paoli Rd	Easttown (T)	School
Wonder Years Preschool	835 Darby Paoli Rd	Easttown (T)	School
Twin Valley Elementary School	50 Mast Dr	Elverson (B)	School
Early Learning Center at Kemblesville	1769 New London Rd	Franklin (T)	School
Landenberg Christian Academy	109 Gypsy Hill Rd	Franklin (T)	School
Octorara Area Elementary School	104 Highland Rd	Highland (T)	School
Octorara Head Start	104 Highland Rd	Highland (T)	School
Octorara Primary Learning Center	87 Highland Rd	Highland (T)	School
Honey Brook Early Learning Center	1099 Maple St	Honey Brook (B)	School
Gateway Baptist Academy	143 Suplee Rd	Honey Brook (T)	School
Honey Brook Elementary School	1530 W Walnut Rd	Honey Brook (T)	School
Greenwood Elementary School	420 Greenwood Rd	Kennett (T)	School
Kennett Square Pre School	401 N Union St	Kennett (T)	School
Kennett High School	100 E South St	Kennett Square (B)	School
Kennett Square Head Start	380 W Cedar St	Kennett Square (B)	School
Mary D Lang Elementary School	409 Center St	Kennett Square (B)	School
Assumption of the Blessed Virgin Mary School	290 State Rd	London Grove (T)	School
Avon Grove Charter School	110 State Rd	London Grove (T)	School
Avon Grove High School	237 State Rd	London Grove (T)	School
Avon Grove Nazarene Academy	240 State Rd	London Grove (T)	School
Fred S. Engle Middle School	112 Schoolhouse Rd	London Grove (T)	School
Sacred Heart School	205 Church Rd	Lower Oxford (T)	School
Malvern Preparatory School	418 S Warren Av	Malvern (B)	School
St Patrick School	115 Channing Av	Malvern (B)	School
Bancroft Elementary School	181 Bancroft Rd	New Garden (T)	School
Creative Play Day School	1027 Newark Rd	New Garden (T)	School
Kennett Middle School	195 Sunny Dell Rd	New Garden (T)	School
New Garden Elementary	265 New Garden Rd	New Garden (T)	School
White Clay Learning Center	250 New Garden Rd	New Garden (T)	School
Avon Grove Intermediate School	395 S Jennersville Rd	New London (T)	School
Coventry Christian Schools	962 E Schuylkill Rd	North Coventry (T)	School
North Coventry Elementary School	475 Kemp Rd	North Coventry (T)	School
West-Mont Christian Academy	873 S Hanover St	North Coventry (T)	School
Elk Ridge School	200 Wickersham Road	Oxford (B)	School
Jordan Bank School	536 Hodgson St	Oxford (B)	School
Nottingham Elementary School	736 Garfield St	Oxford (B)	School
Oxford Head Start (Jordan Bank)	536 Hodgson St	Oxford (B)	School
Penn's Grove School	301 S Fifth Street	Oxford (B)	School
Parquesburg Mennonite School	44 E Second Av	Parquesburg (B)	School
Chester County IU - Pennock Bridge	280 Pennock's Bridge Road	Penn (T)	School
Jennersville Head Start (TCHS-PB)	280 Pennock's Bridge Road	Penn (T)	School
Penn London Elementary School	383 S Jennersville Rd	Penn (T)	School
The Growing Place	390 Vineyard Wy, Suite 301	Penn (T)	School
Word of Life Christian Academy	127 Woodcrest Rd	Penn (T)	School
Chadds Ford Elementary School	3 Baltimore Pk	Pennsbury (T)	School
Hillendale Elementary School	1850 Hillendale Rd	Pennsbury (T)	School
Barkley Elementary School	320 Second Av	Phoenixville (B)	School
Holy Family School	221 Third Av	Phoenixville (B)	School



Name	Address	Municipality	Bldg. Type
Kindergarten Center	100 School Ln	Phoenixville (B)	School
Phoenixville Area High School	1200 Gay St	Phoenixville (B)	School
Phoenixville Area Middle School	1000 Purple Pride Parkway	Phoenixville (B)	School
Valley Forge Kinder House	865 S Main St	Phoenixville (B)	School
Pocopson Elementary School	1105 Pocopson Rd	Pocopson (T)	School
Phoenixville Head Start (TCHS-P)	1580 Charlestown Rd	Schuylkill (T)	School
Renaissance Academy	40 Pine Crest Av	Schuylkill (T)	School
Schuylkill Elementary School	290 S Whitehorse Rd	Schuylkill (T)	School
Technical College High School - Pickering Campus	1580 Charlestown Rd	Schuylkill (T)	School
Graystone Academy Charter School	139 Modena Rd	South Coatesville (B)	School
Owen J Roberts High School	981 Ridge Rd	South Coventry (T)	School
Owen J Roberts Middle School	881 Ridge Rd	South Coventry (T)	School
Concept School	1120 E Street Rd	Thornbury (T)	School
KinderCare	102 Paddock Ln	Thornbury (T)	School
Agora Cyber Charter School	995 Old Eagle School Rd	Tredyffrin (T)	School
Chesterbrook Academy	1560 Bradford Rd	Tredyffrin (T)	School
Children's School of Cabrini College	45 Walker Rd	Tredyffrin (T)	School
Conestoga High School	200 Irish Rd	Tredyffrin (T)	School
Crossroads School, The	1681 N Valley Rd	Tredyffrin (T)	School
Delaware Valley Friends School	19 E Central Av	Tredyffrin (T)	School
Devon Preparatory School	363 N Valley Forge Rd	Tredyffrin (T)	School
Goddard School	95 Crestline Rd	Tredyffrin (T)	School
Hillside Elementary School	507 Howellville Rd	Tredyffrin (T)	School
International Montessori School at Paoli	1510 Russell Rd	Tredyffrin (T)	School
Launfal School	600 Walker Rd	Tredyffrin (T)	School
Montessori Children's House	1630 Thomas Rd	Tredyffrin (T)	School
New Eagle Elementary School	507 Pugh Rd	Tredyffrin (T)	School
Our Lady of Assumption School	35 Old Eagle School Rd	Tredyffrin (T)	School
Paoli UMC Nursery School	81 Devon Rd	Tredyffrin (T)	School
Royer-Greaves School	118 S Valley Rd	Tredyffrin (T)	School
Show-N-Tell School	38 E Circular Av	Tredyffrin (T)	School
Timothy School, The	973 Old Lancaster Av	Tredyffrin (T)	School
Tredyffrin-Easttown Middle School	801 Conestoga Rd	Tredyffrin (T)	School
Valley Forge Elementary School	99 Walker Rd	Tredyffrin (T)	School
Valley Forge Middle School	105 W Walker Rd	Tredyffrin (T)	School
Valley Forge Military Academy	1001 Eagle Rd	Tredyffrin (T)	School
Vanguard School	1777 N Valley Rd	Tredyffrin (T)	School
Woodlynde School	445 Upper Gulph Rd	Tredyffrin (T)	School
Beth Israel Kindergarten	385 Pottstown Pk	Upper Uwchlan (T)	School
Goddard School	50 Seabolt Wy	Upper Uwchlan (T)	School
Pickering Valley Elementary School	121 Byers Rd	Upper Uwchlan (T)	School
St Elizabeth Parish School	120 St Elizabeth Dr	Upper Uwchlan (T)	School
St Matthew's Preschool and Kindergarten	2440 Conestoga Rd	Upper Uwchlan (T)	School
Upattinas School	429 Greenridge Rd	Upper Uwchlan (T)	School
Windsor Christian Academy	213 Little Conestoga Rd	Upper Uwchlan (T)	School
Achievement House Charter School	600 Eagleview Bl	Uwchlan (T)	School
Chesterbrook Academy	101 Tanner Dr	Uwchlan (T)	School
Children's House of Exton	125 S Village Av	Uwchlan (T)	School
Downingtown High School East	50 Devon Dr	Uwchlan (T)	School
Great Beginnings Preschool	181 Sharp La	Uwchlan (T)	School
KinderCare	200 Whitford Hills Rd	Uwchlan (T)	School
KinderCare	55 S Village Av	Uwchlan (T)	School
Lionville Elementary School	526 W Uwchlan Av	Uwchlan (T)	School
Lionville Middle School	550 W Uwchlan Av	Uwchlan (T)	School
Malvern School	101 Ruark Dr	Uwchlan (T)	School
Marsh Creek 6th Grade Center	489 Dorlan Mill Rd	Uwchlan (T)	School



Name	Address	Municipality	Bldg. Type
Shamona Creek Elementary School	501 Dorlan Mills Rd	Uwchlan (T)	School
St Paul's Preschool	104 S Village Av	Uwchlan (T)	School
Uwchlan Hills Elementary School	50 Peck Rd	Uwchlan (T)	School
Rainbow Elementary School	1113 W. Lincoln Hwy	Valley (T)	School
Valley Christian School	200 Airport Rd	Valley (T)	School
Devereux - Brandywine Campus	160 Devereux Rd	Wallace (T)	School
Springton Manor Elementary School	400 Fairview Rd	Wallace (T)	School
Our Place to Grow, Inc.	1621 Old Ridge Rd	Warwick (T)	School
Bradford Heights Elementary School	1330 Romig Rd	West Bradford (T)	School
Creative Kids of Downingtown	1432 Poorhouse Rd	West Bradford (T)	School
Goddard School	630 Sugars Bridge Rd	West Bradford (T)	School
West Bradford Elementary School	1475 Broad Run Rd	West Bradford (T)	School
Friendship Elementary School	296 Reeceville Rd	West Brandywine (T)	School
North Brandywine Middle School	256 Reeceville Rd	West Brandywine (T)	School
Pope John Paul II Regional Catholic Elementary School	2875 Manor Rd	West Brandywine (T)	School
Reeceville Elementary School	248 Reeceville Rd	West Brandywine (T)	School
King's Highway Elementary School	841 W Kings Hwy	West Caln (T)	School
Care Center Foundation	203 E Barnard St	West Chester (B)	School
Sankofa Academy	446 W Gay St	West Chester (B)	School
St Agnes Elem School	211 W Gay St	West Chester (B)	School
West Chester Friends School	415 N High St	West Chester (B)	School
West Chester Head Start	540 E Union St	West Chester (B)	School
West Chester Nazarene Christian School	202 Dean St	West Chester (B)	School
YMCA Kindergarten Academy	1 E Chestnut St	West Chester (B)	School
Octorara Area High School	226 Highland Rd	West Fallowfield (T)	School
Octorara Intermediate School	221 Highland Rd	West Fallowfield (T)	School
Octorara Junior High School	228 Highland Rd	West Fallowfield (T)	School
West Fallowfield Christian School	795 Fallowfield Rd	West Fallowfield (T)	School
B. Reed Henderson High School	400 Montgomery Av	West Goshen (T)	School
Chesterbrook Academy	1220 Ward Av	West Goshen (T)	School
Chesterbrook Academy Elementary School	1190 McDermott Dr	West Goshen (T)	School
Children's Corner	28 W Rosedale Av	West Goshen (T)	School
Discovery Day School	325 N Five Points Rd	West Goshen (T)	School
E. N. Peirce Middle School	1314 Burke Rd	West Goshen (T)	School
Fern Hill Elementary School	915 Lincoln Av	West Goshen (T)	School
Glen Acres Elementary School	1150 Delancey Pl	West Goshen (T)	School
Goddard School	1050 Andrew Dr	West Goshen (T)	School
J.R. Fugett Middle School	500 Ellis La	West Goshen (T)	School
Kesher Israel Congregation Kindergarten	1000 Pottstown Pk	West Goshen (T)	School
Show-N-Tell School	300 S Five Points Rd	West Goshen (T)	School
The ARC of Chester County	900 Lawrence Dr	West Goshen (T)	School
West Chester Christian School	1237 Paoli Pk	West Goshen (T)	School
West Chester East High School	450 Ellis La	West Goshen (T)	School
Westtown Children's Academy	307 Westtown Rd	West Goshen (T)	School
Willistown Country Day School	1133 Paoli Pk	West Goshen (T)	School
London Grove Friends Kindergarten	1683 Newark Rd	West Marlborough (T)	School
Montgomery School	1141 Kimberton Rd	West Pikeland (T)	School
West Vincent Elementary School	2750 Conestoga Rd	West Vincent (T)	School
21st Century Cyber Charter School	805 Springdale Dr	West Whiteland (T)	School
Chester County Middle College High School	906 Springdale Dr	West Whiteland (T)	School
Chesterbrook Academy	141 Arrandale Bl	West Whiteland (T)	School
Collegium Charter School	535 James Hance Ct	West Whiteland (T)	School
Devereux - Kanner Center	390 E Boot Rd	West Whiteland (T)	School



Name	Address	Municipality	Bldg. Type
Exton Elementary School	301 S Hendricks Ave	West Whiteland (T)	School
Goddard School	300 Carlise Ct	West Whiteland (T)	School
Huntington Learning Center	100 Exton Commons	West Whiteland (T)	School
KinderCare	479 Creamery Wy	West Whiteland (T)	School
Malvern School	1001 Cornerstone Bl	West Whiteland (T)	School
Mary C Howse Elementary School	641 W Boot Rd	West Whiteland (T)	School
New Horizons Montessori Academy	391 Quarry Ln	West Whiteland (T)	School
Sts. Phillip And James	723 E Lincoln Hwy	West Whiteland (T)	School
The Learning Experience	476 Creamery Wy	West Whiteland (T)	School
Whiteland Montessori School	1103 E Lincoln Hwy	West Whiteland (T)	School
B. Rustin High School	1100 Shiloh Rd	Westtown (T)	School
G. A. Stetson Middle School	1060 Wilmington Pk	Westtown (T)	School
KinderCare	400 Skiles Bl	Westtown (T)	School
Penn Wood Elementary School	1470 Johnnys Wy	Westtown (T)	School
Sarah W Starkweather Elementary School	1050 Wilmington Pk	Westtown (T)	School
St Maximilian Kolbe School	300 Daly Dr	Westtown (T)	School
Sts Simon & Jude School	6 Cavanaugh Ct	Westtown (T)	School
Westtown School	975 Westtown Rd	Westtown (T)	School
Westtown-Thornbury Elementary School	750 Westbourne Rd	Westtown (T)	School
Christ Memorial Lutheran School	89 Township Line Rd	Willistown (T)	School
Devereux - Mapleton Campus	655 Sugartown Rd	Willistown (T)	School
General Wayne Elementary School	20 Devon Rd	Willistown (T)	School
Good Samaritan Day School	212 W Lancaster Ave	Willistown (T)	School
International Montessori School at Malvern	315 Central Av	Willistown (T)	School
Malvern School	250 Paoli Pk	Willistown (T)	School
Phelps School	583 Sugartown Rd	Willistown (T)	School
Sugartown Elementary School	611 Sugartown Rd	Willistown (T)	School
Villa Maria Academy High School	370 Old Lincoln Hwy	Willistown (T)	School
Willistown Country Day School	365 Paoli Pk	Willistown (T)	School
Coatesville School District Admin	545 E Lincoln Hwy	Coatesville (C)	School Administration
District Administration	3650 St Peters Rd	Warwick (T)	School Administration
Spellman Administration Building	829 Paoli Pk	West Goshen (T)	School Administration

Source: Chester County

Shelters

Table I-5. Shelters in Chester County

Name	Address	Municipality	Capacity	Bldg. Type	Backup Power
			Unknown		

Source: Chester County

Senior Care and Senior Living Facilities

Table I-6 Senior Facilities in Chester County

Name	Address	Municipality	Capacity	Bldg. Type
Villa Saint Martha	470 Manor Ave	Caln (T)	Unknown	Long Term Care
Brandywine Hall	800 W Miner St	East Bradford (T)	Unknown	Long Term Care
Ashbridge Senior Living	971 E Lancaster Ave	East Caln (T)	Unknown	Long Term Care



Name	Address	Municipality	Capacity	Bldg. Type
Simpson Meadows	101 Plaza Dr	East Caln (T)	Unknown	Long Term Care
Manatawny Manor	30 Old Schuylkill Rd	East Coventry (T)	Unknown	Long Term Care
Bellingham Park Lane	1615 E Boot Rd	East Goshen (T)	Unknown	Long Term Care
Wellington Terrace	1361 E Boot Rd	East Goshen (T)	Unknown	Long Term Care
Atria Woodbridge Place	1191 Rapps Dam Rd	East Pikeland (T)	Unknown	Long Term Care
Spring Mill Sr Living	3000 Balfour Circle	East Pikeland (T)	Unknown	Long Term Care
Southeastern PA Veterans Center	1 Veterans Dr	East Vincent (T)	Unknown	Long Term Care
Chester Valley Rehab & Nursing Center	283 E Lancaster Ave	East Whiteland (T)	Unknown	Long Term Care
Devon Manor	235 East Lancaster Ave	Easttown (T)	Unknown	Long Term Care
Hickory House	3120 Horseshoe Pk	Honey Brook (T)	Unknown	Long Term Care
Tel Hai Retirement Community	1200 Tel Hai Cr	Honey Brook (T)	Unknown	Long Term Care
Brandywine Senior Living at Longwood	301 Victoria Gardens Dr	Kennett (T)	Unknown	Long Term Care
Kendal at Longwood	1109 E Baltimore Pk	Kennett (T)	Unknown	Long Term Care
Willow Tree Hospice	616 East Cypress Street	Kennett (T)	Unknown	Long Term Care
Linden Hall	114 Maiden Ln	Kennett Square (B)	Unknown	Long Term Care
Chatham Acres	315 E London Grove Rd	London Grove (T)	Unknown	Long Term Care
Twin Pines Health Center	315 E London Grove Rd	London Grove (T)	Unknown	Long Term Care
Brandywine River Valley Hospice Services	121 Bell Tower Lane	Lower Oxford (T)	Unknown	Long Term Care
Oxford Health Center at Ware Presbyterian	7 E Locust St	Oxford (B)	Unknown	Long Term Care
Ware Presbyterian Village	4 Westminster Wy	Oxford (B)	Unknown	Long Term Care
Jenners Pond	2000 Greenbriar La	Penn (T)	Unknown	Long Term Care
Preston Residence	200 Sycamore Dr	Penn (T)	Unknown	Long Term Care
Kendal Crosslands	1660 East Street Road	Pennsbury (T)	Unknown	Long Term Care
Golden Living center-Phoenixville	833 S Main St	Phoenixville (B)	Unknown	Long Term Care
Pocopson Home	1695 Lenape Rd	Pocopson (T)	Unknown	Long Term Care
Coventry Manor Health & Rehab Center	3031 Chestnut Hill Rd	South Coventry (T)	Unknown	Long Term Care
Highgate at Paoli Point	600 Paoli Pointe Dr	Tredyffrin (T)	Unknown	Long Term Care
Aseracare Hospice	411 Eagleview Blvd Suite 114	Uwchlan (T)	Unknown	Long Term Care
Harrison Senior Living	300 Strode Ave	Valley (T)	Unknown	Long Term Care
Colonial Woods	1710 Creek Rd	Wallace (T)	Unknown	Long Term Care
Freedom Village at Brandywine	15 Freedom Bl	West Brandywine (T)	Unknown	Long Term Care
Inn at Freedom Village	35 Freedom Blvd	West Brandywine (T)	Unknown	Long Term Care
Barclay Friends	700 N Franklin St	West Chester (B)	Unknown	Long Term Care



Name	Address	Municipality	Capacity	Bldg. Type
The Hickman	400 N Walnut St	West Chester (B)	Unknown	Long Term Care
Neighborhood Visiting Nurse Association	795 East Marshall Street, Suite 204	West Goshen (T)	Unknown	Long Term Care
Pembroke Health & Rehab Residence	1130 West Chester Pk	West Goshen (T)	Unknown	Long Term Care
Buttonwood Farms	14 Buttonwood La	West Vincent (T)	Unknown	Long Term Care
Sunrise of Exton	200 Sunrise Bl	West Whiteland (T)	Unknown	Long Term Care
Sunrise of Westtown	1045 Wilmington Pk	Westtown (T)	Unknown	Long Term Care
Solana at Willistown	1713 West Chester Pike	Willistown (T)	Unknown	Long Term Care
Sunrise of Paoli	324 Lancaster Av	Willistown (T)	Unknown	Long Term Care
Coatesville Senior Apts	339 E Lincoln Hwy	Coatesville (C)	Unknown	Senior Living
Vincent Heights	108 Vincent Heights Ci	East Vincent (T)	Unknown	Senior Living
Heatherwood Retirement Community	3920 Horseshoe Pk	Honey Brook (B)	Unknown	Senior Living
Oxford Senior Apts	305 Market St	Oxford (B)	Unknown	Senior Living
Liberty House Apts	107 Liberty House La	Schuylkill (T)	Unknown	Senior Living
Exton Senior Living	600 N Pottstown Pk	Uwchlan (T)	Unknown	Senior Living
Wellington Eagleview Town Center	589 Dickenson Ct	Uwchlan (T)	Unknown	Senior Living
Denny Reyburn Senior Apts	30 W Barnard St	West Chester (B)	Unknown	Senior Living

Source: Chester County

Transportation Systems

Airports

Table I-7. Public Airports in Chester County

Airport Name	Address	Municipality	Facility Usage
New Garden Airport	1235 Newark Rd	New Garden (T)	Public
GO Carlson Airport	1 Earhart Dr	Valley (T)	Public
Brandywine Airport	1205 Ward Ave	West Goshen (T)	Public

Source: Chester County

Bus Facilities

Table 8. Bus Facilities in Chester County

Bus Name	Address	Municipality	Facility Usage
	Unknown		

Source: Chester County



Lifeline Utility Systems

Communications Facilities

Facility Name	Address	Municipality	Bldg. Type
COMCAST CABLE-Data Center-West Chester	1354 E. Boot Rd.	East Goshen (T)	Communication Facility
Comcast Cable-Goshen Hubsite & Data Center	1306 Goshen Parkway	East Goshen (T)	Communication Facility
Comcast Cable-Kennett Square Hubsite	426 Dalmatian St.	Kennett Square (B)	Communication Facility
Comcast Cable-Malvern Headend	111 Ruthland Av	Malvern (B)	Communication Facility
Comcast Cable-Phoenixville Hub	1101 West Bridge St	Phoenixville (B)	Communication Facility
Comcast Cable-Coatesville Headend	1375 N Manor Rd	West Brandywine (T)	Communication Facility
Comcast Cable-Spotlight Eastern Operations Mgmt.	1245 Wrights La	West Goshen (T)	Communication Facility
Comcast Cable-Data Center/Lab-Downingtown	1002 Cornerstone Bl	West Whiteland (T)	Communication Facility
Comcast Cable-Downingtown Tech Center	1004 Cornerstone Bl	West Whiteland (T)	Communication Facility
Verizon Avondale Co (PA21015)	131 Morris St	Avondale (B)	Telecom
Verizon Coatesville Co (PA21016)	502 E Chestnut St	Coatesville (C)	Telecom
Verizon Downingtown Co (PA21017)	201 Whiteland Av	Downingtown (B)	Telecom
Verizon Parker Ford Co (PA28018)	2621 Old Schuylkill Rd	East Coventry (T)	Telecom
AT&T - MLVRPAAG	75 Valley Stream Pw	East Whiteland (T)	Telecom
At&T (PA1100)	10 Valley Stream Pw	East Whiteland (T)	Telecom
Verizon Switch - West Chester	58 Bacton Hill Rd	East Whiteland (T)	Telecom
Verizon Kemblesville CO (PA21026)	1730 New London Rd	Franklin (T)	Telecom
Verizon Honeybrook Co (PA21025)	4531 Horseshoe Pk	Honey Brook (B)	Telecom
Verizon Mendenhall Co (PA21031)	287 Kennett Pk	Kennett (T)	Telecom
Verizon Kennett Square CO (PA21027)	209 W Linden St	Kennett Square (B)	Telecom
Verizon Landenberg Cdo (PA21028)	203 Landenberg Rd	New Garden (T)	Telecom
Verizon Oxford Co (PA21033)	31 S Second St	Oxford (B)	Telecom
Verizon Phoenixville CO (PA28028)	118 Gay St	Phoenixville (B)	Telecom
Verizon Parkesburg Co (PA21034)	2120 Valley Rd	Sadsbury (T)	Telecom
Verizon Pughtown Cdo (PA28031)	807 Pughtown Rd	South Coventry (T)	Telecom
Verizon Paoli Co (PA21020)	125 Circular Av	Tredyffrin (T)	Telecom
Verizon Eagle (PA21019)	101 Pottstown Pk	Upper Uwchlan (T)	Telecom
Verizon Glenmoore Ess (PA21024)	540 Fairview St	Wallace (T)	Telecom
Verizon West Chester CO (PA21036)	401 S High St	West Chester (B)	Telecom
AT&T - 10141522-Fern Hill Relo	919 Camaro Run Dr	West Goshen (T)	Telecom
Verizon West Grove Co (PA21038)	153 Rosehill Av	West Grove (B)	Telecom
Verizon Chester Springs Co (PA28014)	1634 Yellow Spring Rd	West Pikeland (T)	Telecom
Verizon Exton (PA21021)	201 Miller Wy	West Whiteland (T)	Telecom

Source: Chester County



Potable Water Supply

Table I-9. Potable Water Supply in Chester County

Facility Name	Address	Municipality	Owner	Capacity (gallons/day)
Downingtown Municipal Waste	90 Water Plant Wy	Downingtown (B)	Unknown	Unknown
Shady Lane Water Treatment Plant	135 Shady La	East Vincent (T)	Unknown	Unknown
Phoenixville Water Treatment	49 Water St	Phoenixville (B)	Unknown	Unknown
Fernhill Water Treatment Plant	1027 Fernhill Rd	West Goshen (T)	Unknown	Unknown
Atglen Borough Water Plant	4811 Church Rd	West Sadsbury (T)	Unknown	Unknown

Source: Chester County

Wastewater Facilities

Table I-10. Wastewater Facilities in Chester County

Facility Name	Address	Municipality	Facility Owner	Capacity (thousand gallons/day)
Ingrams Mill Water Treatment Plant	780 N Creek Rd	East Bradford (T)	Unknown	Unknown
Pickering Water Treatment Plant	424 E Swedesford Rd	Schuylkill (T)	Unknown	Unknown
Marsh Harbor Waste Treatment Plant	651 Park Rd	Upper Uwchlan (T)	Unknown	Unknown
Coatesville Water Plant	198 Water Works Rd	West Caln (T)	Unknown	Unknown
Christiana Borough Treatment Plant	1200 Valley Av	West Sadsbury (T)	Unknown	Unknown

Source: Chester County

Energy Resources

Table I-11. Electric Facilities in Chester County

Facility Name	Address	Municipality
Amtrack - Thorndale Substation	4400 Lincoln Hwy	Caln (T)
Caln - Hazelwood Ave	3825 Hazelwood Ave	Caln (T)
Caln - Kings Highway	1309 Kings Hwy	Caln (T)
Caln - Olive Street	1615 Olive St	Caln (T)
PECO Power Lab	175 N Caln Rd	Caln (T)
Charlestown - Conestoga Road	2073 Conestoga Rd	Charlestown (T)
Charlestown - Phoenixville Pike	3200 Phoenixville Pk	Charlestown (T)
Coatesville - Fleetwood Street	475 Fleetwood St	Coatesville (C)
Downingtown - Jefferson Ave	120 Jefferson Ave	Downingtown (B)
Downingtown - Lincoln Ave	538 Lincoln Ave	Downingtown (B)
East Bradford	950 Downingtown Pk	East Bradford (T)
East Coventry - Linfield Road	301 Linfield Rd	East Coventry (T)
East Fallowfield - Spring Dell Road	90 Spring Dell Rd	East Fallowfield (T)
Newlinville Substation	185 Doe Run Rd	East Fallowfield (T)
East Goshen - Ellis Lane	201 Ellis Lane	East Goshen (T)
Goshen Substation	1602 E Strasburg Rd	East Goshen (T)



Facility Name	Address	Municipality
East Marlborough - E Street Road	200 E Street Rd	East Marlborough (T)
East Marlborough - W Street Road	382 W Street Rd	East Marlborough (T)
East Nottingham - Shadyside Road	1009 Shadyside Rd	East Nottingham (T)
Nottingham Substation	138 Union Square Rd	East Nottingham (T)
Cromby	100 Cromby Rd	East Pikeland (T)
East Pikeland - E Seven Stars Road	155 E Seven Stars Rd	East Pikeland (T)
East Whiteland - Lancaster Ave	428 Lancaster Ave	East Whiteland (T)
Planebrook	15 S Bacton Hill Rd	East Whiteland (T)
Easttown - Darby Paoli Road	980 Darby Paoli Rd	Easttown (T)
Franklin - Chesterville Road	526 Chesterville Rd	Franklin (T)
Honey Brook - Todd Road	653 Todd Rd	Honey Brook (T)
Kennett - Hamorton Cutoff Road	130 Hamorton Cutoff Rd	Kennett (T)
Kennett Square - W Cedar Street	200 W Cedar St	Kennett Square (B)
London Grove - Rose Hill Road	218 Rose Hill Rd	London Grove (T)
London Grove - School House Road	300 School House Rd	London Grove (T)
Lower Oxford - Baltimore Pike	1675 Baltimore Pk	Lower Oxford (T)
Malvern - N Sugartown Road	4 N Sugartown Rd	Malvern (B)
Malvern - Old Lincoln Highway	131 Old Lincoln Hwy	Malvern (B)
New Garden - Chambers Road	268 Chambers Rd	New Garden (T)
New Garden - Landenberg Road	322 Landenberg Rd	New Garden (T)
New Garden - Starr Road	318 Starr Rd	New Garden (T)
Oxford - South Street	358 South St	Oxford (B)
Amtrack - Parkesburg Substation	300 Front St	Parkesburg (B)
Parkesburg - N Church Street	83 N Church St	Parkesburg (B)
Penn - Neward Road	2989 Newark Rd	Penn (T)
Pennsbury - Pennsbury Way	1 W Pennsbury Wy	Pennsbury (T)
Phoenixville - Bridge Street	565 Bridge St	Phoenixville (B)
Lenape	912 Pocopson Rd	Pocopson (T)
Pocopson - Lenape Unionville Road	1762 Lenape Unionville Rd	Pocopson (T)
Sadsbury - Meetinghouse Lane	22 Meetinghouse La	Sadsbury (T)
Schuylkill - Valley Forge Road	1115 Valley Forge Rd	Schuylkill (T)
ArcelorMittal - East	59 Ingot Dr	South Coatesville (B)
ArcelorMittal - West	59 Ingot Dr	South Coatesville (B)
South Coventry - Porters Mill Road	100 Porters Mill Rd	South Coventry (T)
Thornbury - Westtown Road	1210 S Westtown Rd	Thornbury (T)
Tredyffrin - Cassatt Road	700 Cassatt Rd	Tredyffrin (T)
Tredyffrin - Lancaster Ave	1015 Lancaster Ave	Tredyffrin (T)
Tredyffrin - Maple Ave	6 Maple Ave	Tredyffrin (T)
Tredyffrin Substation	600 Bearhill Rd	Tredyffrin (T)
Upper Uwchlan - Little Conestoga Road	140 Little Conestoga Rd	Upper Uwchlan (T)
Upper Uwchlan Sub Station	740 Pottstown Pk	Upper Uwchlan (T)
Uwchlan - N Whitford Road	503 N Whitford Rd	Uwchlan (T)



Facility Name	Address	Municipality
Uwchlan - Welsh Pool Road	250 Welsh Pool Rd	Uwchlan (T)
Valley - S Mount Airy Road	201 S Mount Airy Rd	Valley (T)
West Brandywine - Manor Road	2696 Manor Rd	West Brandywine (T)
West Caln - W Kings Highway	515 W Kings Hwy	West Caln (T)
West Chester - W Market Street	439 W Market St	West Chester (B)
West Fallowfield - Highland Road	238 Highland Rd	West Fallowfield (T)
West Goshen - Parkway	923 S High St	West Goshen (T)
West Sadsbury - Lower Valley Road	4760 Lower Valley Rd	West Sadsbury (T)
West Sadsbury - Octorara Trail	849 Octorara Tr	West Sadsbury (T)
West Whiteland - S Whitford Road	149 S Whitford Rd	West Whiteland (T)
West Whiteland - Walsh Ave	307 Walsh Av	West Whiteland (T)
Westtown - E Street Road	625 E Street Rd	Westtown (T)
Amtrack - Paoli Substation	108 W Central Ave	Willistown (T)
Willistown - West Chester Pike	1728 West Chester Pk	Willistown (T)

Source: Chester County

Table I-12. Oil and Natural Gas Facilities in Chester County

Facility Name	Address	Municipality	Facility
Buckeye - East Whiteland	10 Malin Rd	East Whiteland (T)	Natural Gas Pumping Station
Sunoco - East Whiteland	41 Malin Rd	East Whiteland (T)	Natural Gas Pumping Station
Eastern Shore - Londonderry	604 Street Rd	Londonderry (T)	Natural Gas Pumping Station
Texas Eastern - Upper Uwchlan 1	490 Milford Rd	Upper Uwchlan (T)	Natural Gas Pumping Station
Texas Eastern - Upper Uwchlan 2	560 Pottstown Pk	Upper Uwchlan (T)	Natural Gas Pumping Station
Valley - S Mount Airy Road	201 S Mount Airy Rd	Valley (T)	Natural Gas Pumping Station
Columbia - West Bradford	1470 Poorhouse Rd	West Bradford (T)	Natural Gas Pumping Station
Sunoco - West Brandywine	1824 Horseshoe Pk	West Brandywine (T)	Natural Gas Pumping Station
Buckeye Storage	8 S Malin Rd	East Whiteland (T)	Petroleum Storage
Sunoco	1840 Horseshoe Pk	West Brandywine (T)	Petroleum Storage
Sunoco Storage	623 E Lincoln Hwy	West Whiteland (T)	Petroleum Storage

Source: Chester County

High-Potential Loss Facilities

Dams

Table I-13. Dams in Chester County

Dam Name	Municipality	Stream	Type	PA DEP Classification	NID Classification	Permittee	EAP
<i>High-Hazard Dams</i>							
Lincoln Avenue Detention Basin	Downingtown (B)	TR East Brandywine Creek	Earth	High	B-1	Downingtown Borough	Unknown
Marsh Creek Reservoir (PA-437)	Downingtown (B)	TR Crum Creek	Earth, Rockfill	High	C-1	DCNR	Yes



Dam Name	Municipality	Stream	Type	PA DEP Classification	NID Classification	Permittee	EAP
Milltown	East Goshen (T)	East Branch Chester Creek	Earth	High	C-1	East Goshen Municipal Authority	Yes
Walker Farm Lagoon	East Marlborough (T)	TR West Branch Red Clay Creek	Earth	High	C-2	East Marlborough Township	Unknown
Welkinweir	East Nantmeal (T)	TR Beaver Run	Earth	High	C-1	Green Valleys Association	Yes
Leopard Lake	Easttown (T)	Darby Creek	Earth, Stone, Masonry	High	B-1	Leopard Lakes Farm, Inc.	No
R G Struble Lake (PA-431)	Honey Brook (T)	East Branch Brandywine Creek	Earth	High	B-1	Chester County Water Resources Authority	Yes
Lake Somerset	New Garden (T)	Broad Run	Earth	High	C-1	Somerset Lake Service Corporation	Yes
Pine Grove	Pine Grove	Octoraro Creek	Concrete, Earth	High		Chester Water Authority	Yes
Pickering Creek	Schuylkill (T)	Pickering Creek	Concrete, Gravity, Buttress	High	B-1	Aqua Pennsylvania, Inc	Yes
Wharton Boulevard Stormwater	Uwchlan (T)	Shamona Creek	Earth	High	C-1	Eagleview Town Center Condominium Association, Inc.	Yes
Barneston (PA 432)	Wallace (T)	East Branch Brandywine Creek	Earth	High	B-1	Chester County Water Resources Authority	Yes
Beaver Creek (PA-433)	West Brandywine and East Brandywine (T)	Beaver Creek	Earth	High	C-1	Chester County Water Resources Authority	Yes
Hibernia (PA-436F)	West Caln (T)	Birch Run	Earth	High	C-1	Chester County Water Resources Authority	Yes
Rock Run	West Caln (T)	Rock Run	Concrete, Buttress	High	B-1	Pennsylvania American Water Company	Yes
Township Line (Airport Road)	West Goshen (T)	East Branch Chester Creek	Earth	High	B-1	Aqua Pennsylvania, Inc.	Yes
Herr Food Storage Lagoon	West Nottingham (T)	ADJ to Northeast Creek	Earth	High	B-1	Herr Foods, Inc	Yes
Other Dams							
Timber	East Brandywine Township	TR Culbertson Run	Earth	Significant	C-4	Villages at Timberlake	Yes
Pond No 1	East Caln Township	TR Valley Creek	Earth	Low	C-4	General Crushed Stone Company	Unknown
Pond No 2	East Caln Township	TR Valley Creek	Earth	Low	C-4	General Crushed Stone Company	Unknown
Pond No 3	East Caln Township	TR Valley Creek	Earth	Low	C-4	General Crushed Stone Company	Unknown



Dam Name	Municipality	Stream	Type	PA DEP Classification	NID Classification	Permittee	EAP
Brook Crossing Detention	East Fallowfield (T)	East Branch Brandywine Creek	Earth	Significant	C-4	East Fallowfield Township	Yes
Hershey Mill	East Goshen Township	Ridley Creek	Earth, Masonry	Unknown	C-3	East Goshen Township	Yes
Whiteford Ridge Detention Basin	East Lampeter Township	TR Valley Creek	Earth	Significant	C-4	Whiteford Ridge Homeowners Association	No
Wastewater Treatment	East Nottingham Township	Watershed TR Tweed Creek	Earth	Significant	C-4	Oxford Area Sewer Authority	No
Devon Detention	Easttown Township	TR Darby Creek	Earth	Significant	C-4	Waynesbrook Homeowners Association	Yes
Osborne Lagoon	Lower Oxford Township	Watershed Leech Run	Earth	Significant	C-4	Oxford Area Sewer Authority	Unknown
Malvern Preparatory Lower	Malvern Borough	TR Crum Creek	Concrete, Earth	Significant	C-3	Malvern Prep School	Unknown
Crossing No 3	New Garden Township	TR Bucktoe Creek	Earth	Significant	C-3	Hartfield Homeowners Association	No
Crossing No 5	New Garden Township	Bucktoe Creek	Earth	Significant	C-3	Hartfield Homeowners Association	No
Green Valley Farms	New Garden Township	Trout Run	Earth	Significant	C-4	Green Valley Farms	Yes
Lake Somerset	New Garden Township	Broad Run	Earth	Significant	C-3	Somerset Lake Service Corporation	Yes
Somerset Lakes Basin No 2	New Garden Township	TR Broad Run	Earth	Significant	C-4	Somerset Lake Service Corporation	Yes
Cold Springs Park	North Coventry (T)	TR Schuylkill River	Earth	Low	C-4	Patty Barra	Unknown
Washburn Lake	North Coventry Township	TR Pigeon Creek	Earth	Unknown	C-4	Christopher H. and Patricia C. Washburn	Unknown
Savery Mill	Pennsbury Township	Bennetts Run	Earth	Significant	C-4	Savery Mill Homeowners Association	No
Chester CO. Prison Storage Detention Lagoon	Pocopson (T)	Watershed Pocopson Creek	Earth	Significant	C-3	Chester County Facilities Department	No
Linpro Detention Basin	Tredyffrin Township	TR Little Valley Creek	Earth	Significant	C-4	Brandywine Operating Partnership, LP	Yes
Hankin	Uwchlan Township	Shamona Creek	Earth	Low	C-4	The Hankin Group	Unknown
Wharton Boulevard Stormwater	Uwchlan Township	Shamona Creek	Earth	Significant	C-1	Eagleview own Center Condominium Association, Inc	Yes
Thomas Meeting Detention Basin	West Whiteland Township	TR Valley Creek	Earth	Significant	C-4	Thomas Meeting Associates	Yes
West Whiteland Business Park	West Whiteland Township	TR Valley Creek	Earth	Significant	C-4	Whiteland Business Park Owners Association	No



Dam Name	Municipality	Stream	Type	PA DEP Classification	NID Classification	Permittee	EAP
Westtown	Westtown Township	Hickman Run	Earth	Low	C-3	Westtown School	Unknown
Pond View Farm	Willistown Township	Ridley Creek	Earth	Significant	C-4	Joseph and Pat Bellanca	No

Source: PADEP 2019, NPDP 2020

Notes:

- Br Branch
- DCNR Department of Conservation and Natural Resources
- EAP Emergency Action Plan
- NR Not Required
- NPDP National Performance of Dams Program
- PADEP Pennsylvania Department of Environmental Protection

Other Facilities

Table I-14. Other Critical Facilities

Name	Address	Municipality	Bldg. Type
International Montessori Schools at Dilworthtown	1385 Birmingham Rd	Birmingham (T)	Child Care
Brandywine YMCA At Caln Elementary	3609 Lincoln Hwy	Caln (T)	Child Care
Copeland Run Academy	407 N Lloyd Av	Caln (T)	Child Care
Dawn Armstrong	13 Joseph Ct	Caln (T)	Child Care
Jane Kennedy Group Daycare	119 Foundry St	Caln (T)	Child Care
Janes Group Child Care	111 Foundry St	Caln (T)	Child Care
Kindercare Learning Center 301055	3120 Zinn Rd	Caln (T)	Child Care
Little Flock Daycare	2219 Lincoln Hwy	Caln (T)	Child Care
Rosebuds Lil Explorers Daycare	109 Seventeenth Av	Caln (T)	Child Care
The Children's Treehouse Early Learning	11 Betsy La	Caln (T)	Child Care
Kindercare Learning Centers	65 General Warren Bl	Charlestown (T)	Child Care
Warwick Child Care	2060 Charlestown Rd	Charlestown (T)	Child Care
All Gods Children Group Day Care	569 Coates St	Coatesville (C)	Child Care
Chester Valley Learning Center	167 Strode Av	Coatesville (C)	Child Care
A Childs Place Extended Care At Beaver Creek	601 W Pennsylvania Ave	Downingtown (B)	Child Care
A Childs Place Extended Care at East Ward	435 Washington Ave	Downingtown (B)	Child Care
Chester County Intermediate Unit Early Child Care	455 Boot Rd	Downingtown (B)	Child Care
Step By Step Montessori Lcc	122 W Pennsylvania Av	Downingtown (B)	Child Care
Teach And Learn Day School	66 W Lancaster Av	Downingtown (B)	Child Care
ACP Extended Care at East Bradford Elementary	820 Frank Rd	East Bradford (T)	Child Care
ACP Extended Care Hillsdale Elementary	725 W Market St	East Bradford (T)	Child Care
The Goddard School	704 W Nields St Unit 4	East Bradford (T)	Child Care
West Chester Playschool	725 W Miner St	East Bradford (T)	Child Care
A Childs Place Extended Care At Brandywine Wallace	435 Dilworth Rd	East Brandywine (T)	Child Care
Lauren McAlister Group Day Care Home	103 Grandview Dr	East Brandywine (T)	Child Care
Downingtown Academy Learning Center	797 E Lancaster Av	East Caln (T)	Child Care
Just Children	987 E Lancaster Av Ste 100	East Caln (T)	Child Care
Tutor Time Child Care Learning Center	6 Webb Rd	East Caln (T)	Child Care
Our House Early Learning Center	1426 New Schuylkill Rd	East Coventry (T)	Child Care
P F V Y East Coventry Elementary	2461 E Cedarville RD	East Coventry (T)	Child Care
As We Grow Learning Center	1332 Old Wilmington Rd	East Fallowfield (T)	Child Care
Brandywine YMCA At East Fallowfield Elementary	2254 Strasburg Rd	East Fallowfield (T)	Child Care
Butterflies and Bullfrogs A Childcare Company	2375 Strasburg Rd	East Fallowfield (T)	Child Care
Holland Country Day School	1525 S Bailey Rd	East Fallowfield (T)	Child Care
ACP Extended Care at East Goshen Elementary	800 N Chester Rd	East Goshen (T)	Child Care



Name	Address	Municipality	Bldg. Type
West Chester Area YMCA	605 Airport Rd	East Goshen (T)	Child Care
Ducklings Early Learning Center	500 Old Forge La Ste 502	East Marlborough (T)	Child Care
Kennett YMCA at Unionville Elementary	1752 W Doe Run Rd	East Marlborough (T)	Child Care
Westtown Children's Academy	400 River Birch Ci	East Marlborough (T)	Child Care
Barnsley Academy	225 Barnsley Rd	East Nottingham (T)	Child Care
Bright Beginnings Education Center	2222 Baltimore Pk	East Nottingham (T)	Child Care
Tommy Tinkers Too	310 Waterway Rd	East Nottingham (T)	Child Care
Weaver Day School	1055 Little Elk Creek Rd	East Nottingham (T)	Child Care
Weaver Daycare Center	224 Oxford Rd	East Nottingham (T)	Child Care
Abc123 Early Learning Center	2280 Kimberton Rd	East Pikeland (T)	Child Care
Joanne Allie Group Day Care	150 Coldstream Rd	East Pikeland (T)	Child Care
Kindercare Learning Cnt-1405	331 Schuylkill Rd	East Pikeland (T)	Child Care
P F V Y East Pikeland Elementary School	1191 Hares Hill Rd	East Pikeland (T)	Child Care
Teach & Learn Day School	283 Schuylkill Rd	East Pikeland (T)	Child Care
Grace Assembly Day Care Center	1271 W Bridge St	East Vincent (T)	Child Care
P F V Y Spring City Elementary	190 S Wall St	East Vincent (T)	Child Care
P F V Y Vincent Elementary	340 Ridge Rd	East Vincent (T)	Child Care
Arbor Learning Academy	17 Ravine Rd	East Whiteland (T)	Child Care
Brandywine Children's House	111 Great Valley Pw	East Whiteland (T)	Child Care
Building Blocks Learning Child Dev Ctr	964 Swedesford Rd	East Whiteland (T)	Child Care
Chesterbrook Academy	315 Technology Dr	East Whiteland (T)	Child Care
International Montessori Schools at Great Valley	79 Lancaster Av	East Whiteland (T)	Child Care
The Malvern School	383 Lancaster Av	East Whiteland (T)	Child Care
Warwick Child Care	354 Swedesford Rd	East Whiteland (T)	Child Care
Warwick Child Care Center	11 Church Rd	East Whiteland (T)	Child Care
A Childs Place	524 Sugartown Rd	Easttown (T)	Child Care
A Childs Place-Beaumont Elementary	575 Beaumont Rd	Easttown (T)	Child Care
A Childs Place-Devon Elem School	400 S Fairfield Rd	Easttown (T)	Child Care
Berwyn Montessori	719 Berwyn Av	Easttown (T)	Child Care
Berwyn YMCA	1416 Berwyn Paoli Rd	Easttown (T)	Child Care
Cambridge Schools	835 Darby Paoli Rd	Easttown (T)	Child Care
The Whole Child Learning Center	55 N Brick La	Elverson (B)	Child Care
Jennersville At Kemblesville Elc	1769 New London Rd	Franklin (T)	Child Care
The Early Learning Workshop	20 McMaster Bl	Franklin (T)	Child Care
Octorara YMCA at Octorara Elementary	104 Highland Rd	Highland (T)	Child Care
Honey Brook Early Learning Center	1099 Maple St	Honey Brook (B)	Child Care
Clowning Around Day Care	24 Diane Dr	Honey Brook (T)	Child Care
Rainbow Valley Child Care	584 Poplar Rd	Honey Brook (T)	Child Care
Tel Hai Child Day Care Center	1143 Beaver Dam Rd	Honey Brook (T)	Child Care
Chester County Family Development Center	421 McFarlan Rd	Kennett (T)	Child Care
Kennett YMCA at Greenwood Elementary	420 Greenwood Rd	Kennett (T)	Child Care
J A M Christian Day Care	415 W State St	Kennett Square (B)	Child Care
Kennett YMCA	101 Race St	Kennett Square (B)	Child Care
Avon Grove Nazarene Day Care Center 2	240 State Rd	London Grove (T)	Child Care
Jennersville YMCA at Avon Grove Charter	110 State Rd	London Grove (T)	Child Care
Westtown Children's Academy	2 Moxley La	London Grove (T)	Child Care
Ducklings Early Learning Center	101 Conner Rd	Lower Oxford (T)	Child Care
Creative Play Day Sch Main Bldg.	1027 Newark Rd	New Garden (T)	Child Care
Kennett YMCA At Bancroft Elementary	181 Bancroft Rd	New Garden (T)	Child Care
Kennett YMCA at New Garden Elementary	265 New Garden Rd	New Garden (T)	Child Care
New Garden Early Care & Edu Center	250 New Garden Rd	New Garden (T)	Child Care
Tick Tock Early Learning Center	1694 Baltimore Pk	New Garden (T)	Child Care
Tommy Tinkers	279 Chambers Rd	New Garden (T)	Child Care
Jennersville YMCA at Avon Grove Intermediate	395 S Jennersville Rd	New London (T)	Child Care
P F V Y North Coventry	475 Kemp Rd	North Coventry (T)	Child Care
Warwick Child Care	200 E Cedarville Rd	North Coventry (T)	Child Care



Name	Address	Municipality	Bldg. Type
Warwick Day Care Center	145 W Urner St	North Coventry (T)	Child Care
Bright Beginnings Child Care	15 Second St	Oxford (B)	Child Care
Bright Beginnings Education Center	536 Hodgson St	Oxford (B)	Child Care
Jennersville YMCA at Nottingham Elementary	736 Garfield St	Oxford (B)	Child Care
Creative Minds Child Care Learning Center	418 W First Av	Parkesburg (B)	Child Care
Jennersville YMCA	880 W Baltimore Pk	Penn (T)	Child Care
Jennersville YMCA at Penn London Elementary	375 S Jennersville Rd	Penn (T)	Child Care
The Growing Place Childcare And Preschool	390 Vineyard Wy Bldg. 600	Penn (T)	Child Care
Kendal Child Development Center	103 Crosslands Dr	Pennsbury (T)	Child Care
Kennett YMCA at Chaddsford Elementary	3 Baltimore Pk	Pennsbury (T)	Child Care
Kennett YMCA at Hillendale Elementary	1850 Hillendale Rd	Pennsbury (T)	Child Care
Westtown Children's Academy Chaddsford	540 Baltimore Pk	Pennsbury (T)	Child Care
Magic Memories Kindergarten Center	100 School La	Phoenixville (B)	Child Care
Moms House Of Greater Phila	143 Main St	Phoenixville (B)	Child Care
P F V Y Barkley Elementary	320 Second Av	Phoenixville (B)	Child Care
Phoenixville Area Children's Learning Ctr Site 2	400 Franklin Av Ste 109	Phoenixville (B)	Child Care
Phoenixville Area Clc	310 Main St Apt 1	Phoenixville (B)	Child Care
Vfkh Montessori School	865 Main St	Phoenixville (B)	Child Care
Kennett YMCA at Pocopson Elementary	1105 Pocopson Rd	Pocopson (T)	Child Care
Kiddie Barn Childcare	2975 Lincoln Hwy	Sadsbury (T)	Child Care
Magic Memories	897 Valley Forge Rd	Schuylkill (T)	Child Care
Mna Learning Services	10 Chrisevyn La	Schuylkill (T)	Child Care
P F V Y Schuylkill Elementary School	290 S White Horse Rd	Schuylkill (T)	Child Care
Pfvv Phoenixville Sacc	400 E Pothouse Rd	Schuylkill (T)	Child Care
P F V Y French Creek Elementary	3590 Coventryville Rd	South Coventry (T)	Child Care
Warwick Child Care Center	1190 Ridge Rd	South Coventry (T)	Child Care
Kindercare Learning Center	102 Paddock La	Thornbury (T)	Child Care
A Childs Place-Ecep Valley Forge Elem School	99 Walker Rd	Tredyffrin (T)	Child Care
A Childs Place-Hillside Elem School	507 Howellville Rd	Tredyffrin (T)	Child Care
A Childs Place-New Eagle School	507 Pugh Rd	Tredyffrin (T)	Child Care
A Childs Place-T/E Middle School	801 Conestoga Rd	Tredyffrin (T)	Child Care
A Childs Place-Valley Forge Middle School	105 W Walker Rd	Tredyffrin (T)	Child Care
Armenian Sisters Academy	440 Upper Gulph Rd	Tredyffrin (T)	Child Care
Beautiful Beginnings	203 N Valley Forge Rd	Tredyffrin (T)	Child Care
Chesterbrook Academy	1560 Bradford Rd	Tredyffrin (T)	Child Care
International Montessori Schools at Paoli	1510 Russell Rd	Tredyffrin (T)	Child Care
Launfal School	600 Walker Rd	Tredyffrin (T)	Child Care
Montessori Children's House Of Valley Forge	1630 Thomas Rd	Tredyffrin (T)	Child Care
Show N Tell School	38 E Circular Av	Tredyffrin (T)	Child Care
The Goddard School	95 Crestline Rd	Tredyffrin (T)	Child Care
Vertykes Learning Place	1001 Old Cassatt Rd	Tredyffrin (T)	Child Care
A Childs Place Extended Care at Pickering Valley	121 Byers Rd	Upper Uwchlan (T)	Child Care
Bright Light Learning Center	70 Senn Dr	Upper Uwchlan (T)	Child Care
The Goddard School	125 Little Conestoga Rd	Upper Uwchlan (T)	Child Care
A Childs Place Extended Care at Lionville	526 W Uwchlan Ave	Uwchlan (T)	Child Care
A Childs Place Extended Care at Marsh Creek	501 Dorlans Mill Rd	Uwchlan (T)	Child Care
A Childs Place Extended Care at Uwchlan Hills	50 Peck Rd	Uwchlan (T)	Child Care
Chesterbrook Academy	101 Tanner Dr	Uwchlan (T)	Child Care
Kindercare Learning Center 000228	630 W Uwchlan Av	Uwchlan (T)	Child Care
Kindercare Learning Centers	200 Whitford Hills Rd	Uwchlan (T)	Child Care
La Petite Academy	91 Sheree Bl	Uwchlan (T)	Child Care
Lionville Community YMCA	100 Devon Dr	Uwchlan (T)	Child Care
Our Kids Academy at Eagleview	510 Herman O West Dr	Uwchlan (T)	Child Care
Our Kids Academy at Town Center	699 Rice Bl	Uwchlan (T)	Child Care
The Malvern School of Lionville	14 N Village Av	Uwchlan (T)	Child Care



Name	Address	Municipality	Bldg. Type
Warwick Child Care	38 S Village Av	Uwchlan (T)	Child Care
Academy Kids	555 Fox Chase Rd	Valley (T)	Child Care
As We Grow Learning Center	1092 W Lincoln Hwy	Valley (T)	Child Care
Brandywine YMCA at Rainbow Elementary	1113 W Lincoln Hwy	Valley (T)	Child Care
Creative Minds Child Care Learning Center	34 Lamberts La	Valley (T)	Child Care
Kangaroo Land	255 S Mount Airy Rd	Valley (T)	Child Care
Little Flock Daycare LLC	412 Pleasant Valley Dr	Valley (T)	Child Care
A Childs Place Extended Care at Springton Manor	400 Fairview Rd	Wallace (T)	Child Care
A Childs Place Extended Care At Bradford Heights	1330 Romig Rd	West Bradford (T)	Child Care
A Childs Place Extended Care at West Bradford	1475 Broad Run Rd	West Bradford (T)	Child Care
Creative Kids Of Downingtown	1424 Poorhouse Rd	West Bradford (T)	Child Care
Firm Foundations	1497 Sawmill Rd	West Bradford (T)	Child Care
Lisa M Holland	1344 Piedmont Dr	West Bradford (T)	Child Care
The Goddard School	630 Sugars Bridge Rd	West Bradford (T)	Child Care
Brandywine YMCA at Friendship Elementary	296 Reeceville Rd	West Brandywine (T)	Child Care
Brandywine YMCA at Reeceville Elementary	248 Reeceville Rd	West Brandywine (T)	Child Care
Brandywine YMCA Day Care Center	295 Hurley Rd	West Brandywine (T)	Child Care
Kathy Hawks Day Care	553 Hibernia Rd	West Brandywine (T)	Child Care
Brandywine YMCA at Kings Highway Elementary	841 W Kings Hwy	West Caln (T)	Child Care
Ogdens Christian Day Care	128 Engletown Rd	West Caln (T)	Child Care
Wagontown Country Day Care	469 W Kings Hwy	West Caln (T)	Child Care
Little Darlings Daycare	434 W Chestnut St	West Chester (B)	Child Care
Little Faces Childcare Center	426 W Gay St	West Chester (B)	Child Care
Oscar Lasko Youth Program Center	1 E Chestnut St	West Chester (B)	Child Care
West Chester Area Day Care Center	501 E Niels St	West Chester (B)	Child Care
West Chester Nazarene Christian School	202 Dean St	West Chester (B)	Child Care
West Chester United Methodist Children's Center	129 S High St	West Chester (B)	Child Care
Abc Kidz Kare	1024 Pottstown Pk	West Goshen (T)	Child Care
ACP Extended Care at Fern Hill Elementary	915 Lincoln Ave	West Goshen (T)	Child Care
ACP Extended Care at Glen Acres Elementary	1150 Delancey Pl	West Goshen (T)	Child Care
Arc First Step	900 Lawrence Dr	West Goshen (T)	Child Care
Atlantic Coast Athletic Club	1130 McDermott Dr	West Goshen (T)	Child Care
Chesterbrook Academy	1220 Ward Av Ste 100	West Goshen (T)	Child Care
Chesterbrook Academy Elementary	1190 McDermott Dr	West Goshen (T)	Child Care
Children's Corner	28 W Rosedale Av	West Goshen (T)	Child Care
Kindercare Learning Center 073094	1154 West Chester Pk	West Goshen (T)	Child Care
Show N Tell Nursery Day School	300 S Five Points Rd	West Goshen (T)	Child Care
The Goddard School	1050 Andrew Dr	West Goshen (T)	Child Care
The Learning Experience Child Development Center	915 Old Fern Hill Rd Ste 101	West Goshen (T)	Child Care
Westtown Children's Academy	307 Westtown Rd	West Goshen (T)	Child Care
Willistown County Day School 3	1133 Paoli Pk	West Goshen (T)	Child Care
West Grove Day Care	165 E Harmony Rd	West Grove (B)	Child Care
Curiosity Corner	2970 Upper Valley Rd	West Sadsbury (T)	Child Care
P F V Y West Vincent Elementary	2750 Conestoga Rd	West Vincent (T)	Child Care
ACP Extended Care at Exton Elementary	301 Hendricks Ave	West Whiteland (T)	Child Care
ACP Extended Care at Mary C Howse Elementary	641 W Boot Rd	West Whiteland (T)	Child Care
Chesterbrook Academy	<Null>	West Whiteland (T)	Child Care
Kathleen Clery Group Home	305 S Balderston Dr	West Whiteland (T)	Child Care
New Horizons Montessori Academy	253 S Whitford Rd	West Whiteland (T)	Child Care
The Goddard School	300 Carlisle Ct	West Whiteland (T)	Child Care
The Learning Experience	476 Creamery Wy	West Whiteland (T)	Child Care
Welcomekidz	305 N Pottstown Pk	West Whiteland (T)	Child Care
ACP Extended Care at Sarah W Starkweather Elem	1050 Wilmington Pk	Westtown (T)	Child Care



Name	Address	Municipality	Bldg. Type
ACP Extended Care at Westtown Thornbury Elem	750 Westbourne Rd	Westtown (T)	Child Care
ACP Extended Care I Nc at Pennwood Elementary	1470 Johnnys Wy	Westtown (T)	Child Care
Kindercare Learning Center 301615	400 Skiles Bl	Westtown (T)	Child Care
Oak Lane Day Care	975 Westtown Rd	Westtown (T)	Child Care
International Montessori Schools	315 Central Av	Willistown (T)	Child Care
Kindercare Learning Center 073093	340 Central Av	Willistown (T)	Child Care
The Goddard School	250 Lancaster Av	Willistown (T)	Child Care
The Malvern School	250 Paoli Pk	Willistown (T)	Child Care
Warwick Child Care	611 Sugartown Rd	Willistown (T)	Child Care
Warwick Child Care	20 Devon Rd	Willistown (T)	Child Care
Willistown Country Day School	365 Paoli Pk	Willistown (T)	Child Care
Chester County Prison	501 S Wawaset Rd	Pocopson (T)	Correctional Facility
Chester County Youth Center	505 S Wawaset Rd	Pocopson (T)	Correctional Facility
Chester County Food Bank	650 Pennsylvania Dr	Uwchlan (T)	Food Bank
Bedwell Co Inc	200 Great Valley Pkwy	Birmingham (T)	Major Business
Otto's BMW	1275 Wilmington Pike	Birmingham (T)	Major Business
470 Manor Operating LLC	470 Manor Ave	Caln (T)	Major Business
Acme	3951 W Lincoln Hwy	Caln (T)	Major Business
Brandywine Hospital	400 Lapp Rd	Caln (T)	Major Business
Giant Food Stores	800 Commons Dr	Caln (T)	Major Business
Handi Crafters	215 Barley Sheaf Rd	Caln (T)	Major Business
Keystone Service Systems Inc	352 Marshallton Thorndale Rd	Caln (T)	Major Business
Kohl's	3477 Lincoln Hwy	Caln (T)	Major Business
Us Veterans Medical Ctr	1400 Blackhorse Hill Rd	Caln (T)	Major Business
Becket & Watkins	191 Sheree Blvd # 102	Charlestown (T)	Major Business
Citgo Mutual Fund Services Inc	191 Sheree Blvd # 102	Charlestown (T)	Major Business
Crane Payment Innovations Inc	1180 Swedesford Rd	Charlestown (T)	Major Business
Devault Packing	996 Old Eagle School Rd Ste 1121	Charlestown (T)	Major Business
INC Infor (US) Inc	40 General Warren Blvd # 110	Charlestown (T)	Major Business
Infersroll-Rand Company	40 General Warren Blvd # 110	Charlestown (T)	Major Business
Temenos USA Inc	40 General Warren Blvd	Charlestown (T)	Major Business
Arcelor Mittal	1105 Industrial Blvd	Coatesville (C)	Major Business
Unique Aid	N 5Th Ave	Coatesville (C)	Major Business
Bayada Home Health Care Inc	304 New Mill Ln	Downingtown (B)	Major Business
Laurie P Micken	1045 Boot Rd	Downingtown (B)	Major Business
Pactiv Packaging Inc	241 Woodbine Rd	Downingtown (B)	Major Business
Pepperidge Farm Inc	421 Boot Rd	Downingtown (B)	Major Business
Relative Care LLC	142 Wallace Ave #104	Downingtown (B)	Major Business
Roberts Automobiles Lp	19 Park Ln	Downingtown (B)	Major Business
Tri Pac Inc	441 Boot Rd # 300	Downingtown (B)	Major Business
Victory Brewing Co	420 Acorn Ln	Downingtown (B)	Major Business
Brandywine Hall	105 Westtown Rd # B	East Bradford (T)	Major Business
Giant Food Stores	30 Spring Mill Dr	East Bradford (T)	Major Business
Crops Market LLC	42 E Lancaster Ave # 1	East Brandywine (T)	Major Business
Aramark Campus LLC	15 S High St	East Caln (T)	Major Business
Best Buy	1180 Swedesford Rd	East Caln (T)	Major Business
Bj's Wholesale Club	121 N Walnut St Ste 500,	East Caln (T)	Major Business
Cracker Barrel Old Country Str	2 Industrial Blvd	East Caln (T)	Major Business
Downingtown Country Club	833 S Main St	East Caln (T)	Major Business
Flik Lifestyles LLC	1200 Tel Hai Cir	East Caln (T)	Major Business
Home Depot	965 E Lancaster Ave	East Caln (T)	Major Business



Name	Address	Municipality	Bldg. Type
Human Services Inc	400 Boot Rd	East Caln (T)	Major Business
Jeff D'ambrosio Auto Group	1221 Cornerstone Blvd	East Caln (T)	Major Business
Jeff D'ambrosio Auto Group	1225 E Lancaster Ave	East Caln (T)	Major Business
Lowe's Home Improvement	1250 Cornerstone Blvd	East Caln (T)	Major Business
Olive Garden Italian Kitchen	101 Quarry Rd	East Caln (T)	Major Business
Shearon Environmental Design Company	340 Boot Rd	East Caln (T)	Major Business
Texas Roadhouse	1205 E Lancaster Ave	East Caln (T)	Major Business
Wegmans	E Lancaster Ave	East Caln (T)	Major Business
Manatawny Manor	30 Old Schuylkill Rd	East Coventry (T)	Major Business
Applebrook Golf Club House	224 Valley Creek Blvd	East Goshen (T)	Major Business
Communications Test Design Inc	1107 E Baltimore Park	East Goshen (T)	Major Business
Communications Test Design Inc	352 Marshallton Thorndale Rd	East Goshen (T)	Major Business
Competitive Media Reporting	1045 Boot Rd	East Goshen (T)	Major Business
De Puy Synthes Co	121 N Walnut St Ste 500,	East Goshen (T)	Major Business
Depuy Synthes Co	400 E Marshall St	East Goshen (T)	Major Business
Giant Food Stores	1615 West Chester Pike	East Goshen (T)	Major Business
Infiana USA Inc	1302 Goshen Pkwy	East Goshen (T)	Major Business
Keystone Foods Corp	905 Airport Rd	East Goshen (T)	Major Business
Mars Drinks	1301 Wilson Dr	East Goshen (T)	Major Business
SI Bellingham LLC	615 E Boot Rd	East Goshen (T)	Major Business
Synthes USA Products LLC	1303 Goshen Pkwy	East Goshen (T)	Major Business
Wellington at Hershey's Mill	1361 E Boot Rd	East Goshen (T)	Major Business
YMCA	605 Airport Rd	East Goshen (T)	Major Business
Everfast Inc	158 W Gay St # 310	East Marlborough (T)	Major Business
Giant Food Stores	15 Lee Blvd	East Marlborough (T)	Major Business
Longwood Gardens	1001 Longwood Rd	East Marlborough (T)	Major Business
Tri-m Electrical	206 Gale Ln	East Marlborough (T)	Major Business
Walmart	516 School House Rd	East Marlborough (T)	Major Business
Camphill Special School	40 S Village Ave	East Nantmeal (T)	Major Business
Powerback Rehabilitation	3000 Balfour Cir	East Pikeland (T)	Major Business
Spring Mill Senior Living	3000 Balfour Cir	East Pikeland (T)	Major Business
Target	200 Mill Rd	East Pikeland (T)	Major Business
Davlyn Manufacturing Co Inc	1380 Bartlett Rd	East Vincent (T)	Major Business
Seven Stars Inn	263 Hoffecker Rd	East Vincent (T)	Major Business
Acme	75 Valley Stream Pkwy	East Whiteland (T)	Major Business
Agc Chemicals Americas Inc	100 Deerfield Ln #250	East Whiteland (T)	Major Business
Allan Myers	638 Lancaster Ave	East Whiteland (T)	Major Business
Alliantec Inc	100 Deerfield Ln	East Whiteland (T)	Major Business
Animal Critical Care/Specialty Grp	340 Lancaster Ave	East Whiteland (T)	Major Business
Balfour Beatty Campus Sltns	1502 W Chester Pike	East Whiteland (T)	Major Business
Cadient Inc	1475 Dunwoody Dr	East Whiteland (T)	Major Business
Camilla Hall Nursing Home	800 Commons Dr	East Whiteland (T)	Major Business
Cerner Corp	27 Great Valley Pkwy	East Whiteland (T)	Major Business
Certain Teed Corp	215 Bullens Lane	East Whiteland (T)	Major Business
Charles River Laboratories Inc	304 New Mill Ln	East Whiteland (T)	Major Business
Chester Valley Golf Club	1270 Baltimore Pike	East Whiteland (T)	Major Business
Cisco Systems	222 Valley Creek Blvd # 300	East Whiteland (T)	Major Business
Cubsmart Lp	640 North Lewis Road	East Whiteland (T)	Major Business
Ellucian	706 Autopark Blvd	East Whiteland (T)	Major Business
Endo International	300 Kimberton Rd	East Whiteland (T)	Major Business
Entech Consulting	55 Valley Stream Pkwy	East Whiteland (T)	Major Business
Erm Group Inc	801 Old Cassatt Rd # 300	East Whiteland (T)	Major Business
F M Global	60 Surrey Way	East Whiteland (T)	Major Business
Faro Technologies Inc	1303 Goshen Pkwy	East Whiteland (T)	Major Business
Frontline Technologies Group LLC	900 Lawrence Dr	East Whiteland (T)	Major Business



Name	Address	Municipality	Bldg. Type
Fujirebio Diagnostics Inc	NA	East Whiteland (T)	Major Business
GVH Partners	1 Liberty Blvd	East Whiteland (T)	Major Business
HAVPAK INC	27 Great Valley Pkwy	East Whiteland (T)	Major Business
Hms Interiors Inc.	380 Three Tun Rd	East Whiteland (T)	Major Business
Home Depot	690 Lancaster Ave	East Whiteland (T)	Major Business
Jaggaer	18 Campus Blvd	East Whiteland (T)	Major Business
Janseen Research & Development LLC	200 Great Valley Pkwy	East Whiteland (T)	Major Business
Merit Medical Systems	65 Great Valley Pkwy	East Whiteland (T)	Major Business
Microsoft Corporation	45 Liberty Blvd	East Whiteland (T)	Major Business
Pq Corp	300 Lindenwood Dr	East Whiteland (T)	Major Business
Progressive Business Publs	370 Technology Dr	East Whiteland (T)	Major Business
Ricoh Americas Corp	70 Valley Stream Pkwy	East Whiteland (T)	Major Business
Saint-Gobain Corp	20 Moores Rd	East Whiteland (T)	Major Business
Sheraton Great Valley Hotel	707 Lancaster Ave	East Whiteland (T)	Major Business
Siemens Medical Solutions USA Inc	40 Liberty Blvd	East Whiteland (T)	Major Business
Stream Companies Inc	400 Lapp Rd	East Whiteland (T)	Major Business
Sungard He	4 Country View Rd	East Whiteland (T)	Major Business
Target	455 Carnegie Blvd	East Whiteland (T)	Major Business
Teva Biologics & Specialty Products	41 Moores Rd	East Whiteland (T)	Major Business
Teva Branded Pharmaceutical Product	2 W Liberty Blvd	East Whiteland (T)	Major Business
Truecare Home Care Services Inc	425 Technology Dr # 200	East Whiteland (T)	Major Business
Vanguard Group Inc	3 Great Valley Pkwy	East Whiteland (T)	Major Business
Veltek Associates	15 Lee Blvd	East Whiteland (T)	Major Business
Vishay Intertechnology Inc	63 Laurelwood Rd	East Whiteland (T)	Major Business
Wegmans	50 Foundry Way	East Whiteland (T)	Major Business
Williamson Hospitality Services INC	97 Great Valley Pkwy	East Whiteland (T)	Major Business
235 E Lancaster Avenue Opco LLC	235 E Lancaster Ave	Easttown (T)	Major Business
A Child's Place Extended Care Inc	524 Sugartown Rd	Easttown (T)	Major Business
Bhhs Fox & Roach Realtors	42 E Lancaster Ave # 1	Easttown (T)	Major Business
Devereux Pa Adult Svc Div	241 Woodbine Rd	Easttown (T)	Major Business
Recovery Centers-amer At Devon	W Lancaster Ave	Easttown (T)	Major Business
Urban Devon Yard LLC.	138 Lancaster Ave Ste 140,	Easttown (T)	Major Business
Waynesborough Country Club	440 Darby Paoli Rd	Easttown (T)	Major Business
YMCA	1416 Berwyn Paoli Rd	Easttown (T)	Major Business
Hms Host	Brandywine Plaza Tpke	Elverson (B)	Major Business
Whitford Corp	47 Park Ave	Elverson (B)	Major Business
Earth Care Inc	142 Wallace Ave #104	Honey Brook (T)	Major Business
Hickory House Nursing Home	3120 Horseshoe Pike	Honey Brook (T)	Major Business
Hoover Building Speclsts LLC	5010 Horseshoe Pike	Honey Brook (T)	Major Business
M Simon Zook Co M	4960 Horseshoe Pike	Honey Brook (T)	Major Business
R-v Industries Inc	584 Poplar Rd	Honey Brook (T)	Major Business
Tel Hai Retirement Community	1200 Tel Hai Cir	Honey Brook (T)	Major Business
Chatham Financial Corp	40 General Warren Blvd # 110	Kennett (T)	Major Business
Exelon Generation Co LLC	110 W Rosedale Ave	Kennett (T)	Major Business
Inn At Mendenhall	323 Kennett Pike	Kennett (T)	Major Business
Kendal Crossroads	1107 E Baltimore Park	Kennett (T)	Major Business
Louis M Marson Jr Inc	749 Norway Rd	Kennett (T)	Major Business
Phillips Gourmet Inc	1011 Kaolin Rdkaolin Rd	Kennett (T)	Major Business
West Chester Gi Assoc Pc	404 McFarlan Rd	Kennett (T)	Major Business
Genesis	201 Waverly Blvd	Kennett Square (B)	Major Business
Genesis	1247 Wrights Ln	Kennett Square (B)	Major Business
Kennett Square Specialties	546 E South St	Kennett Square (B)	Major Business
YMCA	101 Race St	Kennett Square (B)	Major Business
Acme	851 Gap Newport Pike	London Grove (T)	Major Business



Name	Address	Municipality	Bldg. Type
C P Yeatman & Sons Inc	900 Lawrence Dr	London Grove (T)	Major Business
Gourmet's Finest Mushroom Co	397 Eagleview Blvd Ste 200, Suite 2900	London Grove (T)	Major Business
Lowe's Home Improvement	561 Hepburn Rd	London Grove (T)	Major Business
Twin Pines Health Care Ctr	315 E London Grove Rd	London Grove (T)	Major Business
C T Bartoli Mushrooms Inc	600 Cedar Hollow Rd	Londonderry (T)	Major Business
Lincoln University	1570 Baltimore Pike	Lower Oxford (T)	Major Business
Walmart	800 Commons Dr	Lower Oxford (T)	Major Business
Baker Industries	375 Technology Dr	Malvern (B)	Major Business
Malvern Preparatory School	418 S Warren Ave	Malvern (B)	Major Business
Anholt Technologies Inc	440 Church Rd	New Garden (T)	Major Business
Basciani Foods Inc	1801 Pottstown Pike	New Garden (T)	Major Business
Bowling Green Brandywine	1255 Drummers Ln # 200	New Garden (T)	Major Business
Country Fresh	340 Crossings Blvd	New Garden (T)	Major Business
Country Fresh Mushroom Co	4960 Horseshoe Pike	New Garden (T)	Major Business
Giant Food Stores	138 Lancaster Ave Ste 140,	New Garden (T)	Major Business
Giorgio Fresh Co	30 Pottstown Pike	New Garden (T)	Major Business
Greenfield World Trade Inc.	825 Southwood Rd	New Garden (T)	Major Business
International Repacking Inc	1270 Baltimore Pike	New Garden (T)	Major Business
J D Mushrooms	1703 Baltimore Pike	New Garden (T)	Major Business
Kaolin Mushroom Farms Inc	139 Starr Rd	New Garden (T)	Major Business
Modern Mushroom Farms Inc	1320 Newark Rd	New Garden (T)	Major Business
To-jo Mushrooms Inc	974 Penn Green Rd	New Garden (T)	Major Business
W L Gore & Assoc Inc	380 Starr Rd	New Garden (T)	Major Business
Boscov's Department Store	55 Valley Stream Pkwy	North Coventry (T)	Major Business
Coventry Manor Nursing home	1020 Baltimore Pike # 100	North Coventry (T)	Major Business
Giant Food Stores	104 Independence Way	North Coventry (T)	Major Business
Kohl's	351 W Schuylkill Rd	North Coventry (T)	Major Business
Lowe's Home Improvement	1136 Town Square Rd	North Coventry (T)	Major Business
Redner's Warehouse Markets	459 N 3Rd St	Oxford (B)	Major Business
Sunny Dell Foods Inc	135 N 5Th St	Oxford (B)	Major Business
Tasty Baking Co	700 Lincoln St	Oxford (B)	Major Business
Ware Presbyterian Village	7 E Locust St	Oxford (B)	Major Business
Dansko Inc	45 Liberty Blvd	Penn (T)	Major Business
Giant Food Stores	1200 Ward Ave	Penn (T)	Major Business
Jenner's Pond Inc	Greenbriar Ln	Penn (T)	Major Business
Jennersville Regional Hospital	1015 W Baltimore Pike	Penn (T)	Major Business
YMCA	880 W Baltimore Pike	Penn (T)	Major Business
Kendal At Longwood	1109 E Baltimore Pike	Pennsbury (T)	Major Business
Acme	784 Starr St	Phoenixville (B)	Major Business
Customers Bank	748 Springdale Dr # 120	Phoenixville (B)	Major Business
Gateway Pharmacy	110 Bartlett Ave	Phoenixville (B)	Major Business
Giant Food Stores	1475 Dunwoody Dr	Phoenixville (B)	Major Business
Phoenixville Care and Rehabilitation	833 S Main St	Phoenixville (B)	Major Business
Robert Ryan Catering	4 Bridge St	Phoenixville (B)	Major Business
Chester County Pocopson Home	404 Gordon Dr	Pocopson (T)	Major Business
Adecco USA Inc	200 Stewart Huston Dr	Sadsbury (T)	Major Business
Communications Test Design Inc	319 N Pottstown Pike	Sadsbury (T)	Major Business
Intermetro Industries Corp	Gunnard Carlston Dr	Sadsbury (T)	Major Business
Sikorsky Aircraft Corp	110 Stewart Huston Dr	Sadsbury (T)	Major Business
The Martin Brower Company LLC	201 Waverly Blvd	Sadsbury (T)	Major Business
Witmer Public Safety Group INC	104 Independence Way	Sadsbury (T)	Major Business
Eagle Wolfington Leasing Corp	500 E Swedesford Rd	Schuylkill (T)	Major Business
Environmental Standards Inc	707 Eagleview Blvd	Schuylkill (T)	Major Business



Name	Address	Municipality	Bldg. Type
Personal Health Care Inc	1220 Valley Forge Rd # 13,	Schuylkill (T)	Major Business
Phoenixville Hospital	140 Nutt Rd	Schuylkill (T)	Major Business
Sharp Clinical Services Inc	300 Kimberton Rd	Schuylkill (T)	Major Business
Taylor Rental Ctr	766 Valley Forge Rd	Schuylkill (T)	Major Business
University of Valley Forge	1401 Charlestown Rd	Schuylkill (T)	Major Business
YMCA	400 E Pothouse Rd	Schuylkill (T)	Major Business
Archer	1400 Liberty Ridge Dr,	South Coatesville (B)	Major Business
Gross School Bus Service Inc.	1801 Pottstown Pike	South Coventry (T)	Major Business
A C Miller Concrete Products	31 E Bridge St	Spring City (B)	Major Business
Hydromotion Inc	85 E Bridge St	Spring City (B)	Major Business
Spring City Electrical Mfg. Co	1 S Main St	Spring City (B)	Major Business
Giant Food Stores	101 Gordon Dr # 1	Thornbury (T)	Major Business
1 & 1 Internet Inc	701 Lee Rd # 200	Tredyffrin (T)	Major Business
Accenture Limited	1160 W Swedesford Rd	Tredyffrin (T)	Major Business
Acme	39 Leopard Rd	Tredyffrin (T)	Major Business
Acme	700 W Lancaster Ave	Tredyffrin (T)	Major Business
Allstate Insurance Company	1200 Atwater Dr # 200	Tredyffrin (T)	Major Business
Amerisource Bergen Drug Corp	1300 Morris Dr	Tredyffrin (T)	Major Business
Ametek Inc	1498 Morris Dr	Tredyffrin (T)	Major Business
Analytical Graphics Inc	1100 Cassatt Rd	Tredyffrin (T)	Major Business
AscellaHealth	220 Philips Rd	Tredyffrin (T)	Major Business
Bayada Home Health Care Inc	4781 Lower Valley Rd	Tredyffrin (T)	Major Business
Biotelemetry Inc	748 Springdale Dr # 120	Tredyffrin (T)	Major Business
Boomi Inc	40 Liberty Blvd	Tredyffrin (T)	Major Business
Brightview Devon	180 Eagleview Blvd	Tredyffrin (T)	Major Business
Brinker Capital Securities Inc	1200 Tel Hai Cir	Tredyffrin (T)	Major Business
Cenero	1180 W Swedesford Rd # 210	Tredyffrin (T)	Major Business
Comcast Spotlight	200 Great Valley Pkwy	Tredyffrin (T)	Major Business
Crothall Healthcare Inc	418 S Warren Ave	Tredyffrin (T)	Major Business
De Lage Landen	3 Pennsylvania Ave	Tredyffrin (T)	Major Business
Deacom Inc	210 Welsh Pool Rd	Tredyffrin (T)	Major Business
DII Financial Solutions Partner	1220 Valley Forge Rd # 13,	Tredyffrin (T)	Major Business
Efactor Inc	460 E Swedesford Rd # 3020	Tredyffrin (T)	Major Business
Elap Services LLC	19 Park Ln	Tredyffrin (T)	Major Business
Embassy Suites	307 Deerhaven Way,	Tredyffrin (T)	Major Business
Enterprise Leasing Co of Phila LLC	615 E Boot Rd	Tredyffrin (T)	Major Business
Envestnet Financial Technologies	1255 Drummers Ln # 200	Tredyffrin (T)	Major Business
Evolve Ip LLC	400 Lapp Rd	Tredyffrin (T)	Major Business
Forcine Concrete	40 General Warren Blvd	Tredyffrin (T)	Major Business
Genex Services LLC	441 Boot Rd # 300	Tredyffrin (T)	Major Business
Global Tax Management	1180 W Swedesford Rd # 210	Tredyffrin (T)	Major Business
Hewlett-packard	1550 Liberty Ridge Dr	Tredyffrin (T)	Major Business
Johnson Matthey Inc	435 Devon Park Dr	Tredyffrin (T)	Major Business
Keller Williams Realty	744 W Lancaster Ave	Tredyffrin (T)	Major Business
Kenexa an Ibm Co	650 E Swedesford Rd	Tredyffrin (T)	Major Business
Liquid Hub Inc	500 E Swedesford Rd	Tredyffrin (T)	Major Business
Long & Foster Realtors	92 Lancaster Ave	Tredyffrin (T)	Major Business
Main Line Services Inc	1180 Swedesford Rd	Tredyffrin (T)	Major Business
Medecision Inc	550 E Swedesford Rd Ste 220	Tredyffrin (T)	Major Business
Mid-Atlantic Parking Service	1380 Bartlett Rd	Tredyffrin (T)	Major Business



Name	Address	Municipality	Bldg. Type
NIIT Technologies Limited	996 Old Eagle School Rd Ste 1121	Tredyffrin (T)	Major Business
Randstad USA	500 E Swedesford Rd	Tredyffrin (T)	Major Business
Raychem Limited	1050 Westlakes Dr	Tredyffrin (T)	Major Business
Robert Half of Pennsylvania Inc	460 E Swedesford Rd # 3020	Tredyffrin (T)	Major Business
Shire Us	730 Stockton Dr	Tredyffrin (T)	Major Business
Solomon Edwards Group LLC	1255 Drummers Ln # 200	Tredyffrin (T)	Major Business
Surrey Services for Seniors Inc	60 Surrey Way	Tredyffrin (T)	Major Business
Target	704 W Lancaster Ave	Tredyffrin (T)	Major Business
Teleflex Inc	550 E Swedesford Rd	Tredyffrin (T)	Major Business
TURN 5 INC	600 Cedar Hollow Rd	Tredyffrin (T)	Major Business
Unisys Corp	2476 Swedesford Rd	Tredyffrin (T)	Major Business
Valley Forge Educational Svc	1777 N Valley Rd	Tredyffrin (T)	Major Business
Wendover Financial	1550 Liberty Ridge Dr	Tredyffrin (T)	Major Business
Whole Foods Market	821 Lancaster Ave	Tredyffrin (T)	Major Business
Workday Inc	1180 W Swedesford Rd # 210	Tredyffrin (T)	Major Business
Acme	400 Simpson Dr	Upper Uwchlan (T)	Major Business
Dsm Biomedical	1170 Devon Park Dr Ste 300	Upper Uwchlan (T)	Major Business
FedEx Freight Inc	180 Eagleview Blvd	Upper Uwchlan (T)	Major Business
Frontage Laboratories Inc	2 W Liberty Blvd	Upper Uwchlan (T)	Major Business
PAG Pennsylvania Cs LLC	21 Pottstown Pike	Upper Uwchlan (T)	Major Business
Seniors of Northern Chester Co	307 Deerhaven Way,	Upper Uwchlan (T)	Major Business
Universal Technical Institute of Art	750 Pennsylvania Dr	Upper Uwchlan (T)	Major Business
WOLFINGTON BODY CO INC	30 Pottstown Pike	Upper Uwchlan (T)	Major Business
Aegon Direct Marketing Svc	300 Eagleview Blvd	Uwchlan (T)	Major Business
Automotive Training Ctr	601 Lee Rd	Uwchlan (T)	Major Business
Aveanna Healthcare LLC	1002 Cornerstone Blvd	Uwchlan (T)	Major Business
Bentley Systems Inc	352 Marshallton Thorndale Rd	Uwchlan (T)	Major Business
Catholic Health Initiatives	1615 West Chester Pike	Uwchlan (T)	Major Business
Century Cabinetry Inc	825 Southwood Rd	Uwchlan (T)	Major Business
Citadel Federal Credit Union	4781 Lower Valley Rd	Uwchlan (T)	Major Business
Daily Local News	550 E Swedesford Rd Ste 220	Uwchlan (T)	Major Business
Freedom Medical	145 Brandywine Pkwy	Uwchlan (T)	Major Business
Giant Food Stores	750 Pennsylvania Dr	Uwchlan (T)	Major Business
Hilton Hotel	720 Eagleview Blvd	Uwchlan (T)	Major Business
Interim Healthcare	404 Gordon Dr	Uwchlan (T)	Major Business
J W Pepper & Son Inc	191 Sheree Blvd # 102	Uwchlan (T)	Major Business
Journal Register Co	Eagleview Blvd	Uwchlan (T)	Major Business
Kelsch Associates	319 N Pottstown Pike	Uwchlan (T)	Major Business
Morphotek Inc	210 Welsh Pool Rd	Uwchlan (T)	Major Business
Omega Design	211 Philips Rd	Uwchlan (T)	Major Business
Red Robin Gourmet Burgers	600 W Uwchlan Ave	Uwchlan (T)	Major Business
Target	180 Eagleview Blvd	Uwchlan (T)	Major Business
Transamerica Life Insurance Company	350 Eagleview Rd	Uwchlan (T)	Major Business
Unisouce Worldwide Inc	1 E Uwchlan Ave	Uwchlan (T)	Major Business
USSC Acquisition Corp.	101 Gordon Dr # 1	Uwchlan (T)	Major Business
Vickers Restaurant	192 E Welsh Pool Rd	Uwchlan (T)	Major Business
Warwick Child Care Center Inc	40 S Village Ave	Uwchlan (T)	Major Business
West Analytical Svc LLC	530 Herman O West Dr	Uwchlan (T)	Major Business
West Pharmaceutical Svc Inc	530 Herman O West Dr	Uwchlan (T)	Major Business
Workplace dynamics LLC	397 Eagleview Blvd Ste 200, Suite 2900	Uwchlan (T)	Major Business



Name	Address	Municipality	Bldg. Type
YMCA	100 Devon Dr	Uwchlan (T)	Major Business
Ram-t Construction Specialist	1121 Downingtown Pike	West Bradford (T)	Major Business
CCRC-Brandywine LLC	97 Great Valley Pkwy	West Brandywine (T)	Major Business
YMCA	60 Surrey Way	West Brandywine (T)	Major Business
Coatesville Country Club	200 Great Valley Pkwy	West Caln (T)	Major Business
John Rock Inc	500 Independence Way	West Caln (T)	Major Business
Accucare Home Nursing Inc	24 W Market St	West Chester (B)	Major Business
Barclay Friends	656 E Swedesford Rd # 200	West Chester (B)	Major Business
Barnaby's of Amer West Chester	825 Southwood Rd	West Chester (B)	Major Business
Iron Hill Brewery-rstrnt-west	3 W Gay St	West Chester (B)	Major Business
Moody's Analytics Inc	121 N Walnut St Ste 500,	West Chester (B)	Major Business
National Foam	350 E Union St	West Chester (B)	Major Business
New Lifecare Hospital of Chester Co	400 E Marshall St	West Chester (B)	Major Business
Sartomer	610 S Bolmar St	West Chester (B)	Major Business
STP Investment Svc LLC	158 W Gay St # 310	West Chester (B)	Major Business
A Duie Pyle	650 Westtown Rd	West Goshen (T)	Major Business
Acac Fitness & Wellness Ctr	1130 McDermott Dr	West Goshen (T)	Major Business
Advanced Av LLC	208 Carter Dr	West Goshen (T)	Major Business
Advantage Engineers LLC	1025 Andrew Dr	West Goshen (T)	Major Business
Air King America Inc	820 Lincoln Ave	West Goshen (T)	Major Business
Anro Inc of Pennsylvania	1055 Westlakes Dr	West Goshen (T)	Major Business
Berlin Steel Construction Company	1570 Baltimore Pike	West Goshen (T)	Major Business
Bhhs Fox & Roach Realtors	418 S Warren Ave	West Goshen (T)	Major Business
Century 21	100 Devon Dr	West Goshen (T)	Major Business
Chester County Hospital	40 General Warren Blvd # 110	West Goshen (T)	Major Business
Comstar Technologies Inc	1570 Baltimore Pike	West Goshen (T)	Major Business
Ddm Energy	1200 Swedesford Rd # 2	West Goshen (T)	Major Business
Hain Celestial Group Inc.	Old Fern Hill Rd	West Goshen (T)	Major Business
Maillie Falconiero & Co Llp	600 Willowbrook Ln	West Goshen (T)	Major Business
Neighborhood Health Agencies	795 E Marshall St	West Goshen (T)	Major Business
P&A Marketing Inc	7 N 5 Points Rd Fl 1	West Goshen (T)	Major Business
Pembroke Health & Rehab Ctr	1130 W Chester Pike	West Goshen (T)	Major Business
Portescap	110 Westtown Rd	West Goshen (T)	Major Business
Quadrattec	Saunders Ln	West Goshen (T)	Major Business
Qvc Inc	1364 Enterprise Dr	West Goshen (T)	Major Business
Schramm Inc	800 E Virginia Ave	West Goshen (T)	Major Business
Scott Honda of West Chester	706 Autopark Blvd	West Goshen (T)	Major Business
Shop Rite	1115 W Chester Pike	West Goshen (T)	Major Business
Strategic Alliance Staffing	105 Westtown Rd # B	West Goshen (T)	Major Business
Student Services Inc	110 W Rosedale Ave	West Goshen (T)	Major Business
Teva Branded Pharmaceutical Product	145 Brandywine Pkwy	West Goshen (T)	Major Business
The Arc of Chester County	900 Lawrence Dr	West Goshen (T)	Major Business
United Parcel Service Inc	1200 Ward Ave	West Goshen (T)	Major Business
Wayne Moving & Storage Co	100 Lawrence Dr	West Goshen (T)	Major Business
AEG Processing Center No58 Inc	1600 Chestnut Tree Rd	West Nantmeal (T)	Major Business
Blosenski Disposal	1170 Devon Park Dr Ste 300	West Nantmeal (T)	Major Business
Herr Foods Inc.	20 Herr Dr	West Nottingham (T)	Major Business
Herr Foods Inc.	285 Old Baltimore Pike	West Nottingham (T)	Major Business
Home Depot	500 Commons Dr	West Sadsbury (T)	Major Business
J D Eckman	4781 Lower Valley Rd	West Sadsbury (T)	Major Business
Walmart	100 Commons Dr	West Sadsbury (T)	Major Business
Amercare Royal	420 Clover Mill Rd	West Whiteland (T)	Major Business
Auger Fab	358 Technology Dr	West Whiteland (T)	Major Business
Austills Rehabilitation Svc	520 Eagleview Blvd	West Whiteland (T)	Major Business



Name	Address	Municipality	Bldg. Type
Automated Financial Sysys Inc	1155 Phoenixville Pike # 114-1	West Whiteland (T)	Major Business
Autotrader.com Inc	1550 Liberty Ridge Dr # 330	West Whiteland (T)	Major Business
Boscov's Department Store	615 E Boot Rd	West Whiteland (T)	Major Business
Brian's House Inc	1303 Goshen Pkwy	West Whiteland (T)	Major Business
Cornucopia Catering	749 Norway Rd	West Whiteland (T)	Major Business
Devereux Cidds	211 Philips Rd	West Whiteland (T)	Major Business
Devereux Human Resources	7 N 5 Points Rd Fl 1	West Whiteland (T)	Major Business
Giant Food Stores	97 Great Valley Pkwy	West Whiteland (T)	Major Business
HSC Builders & Construction Manager	304 New Mill Ln	West Whiteland (T)	Major Business
Immaculata University	1145 King Rd	West Whiteland (T)	Major Business
Internet Pipeline Inc	222 Valley Creek Blvd Ste 300	West Whiteland (T)	Major Business
Johnson Matthey Inc	1401 King Rd	West Whiteland (T)	Major Business
Keller Williams Realty	100 Campbell Blvd	West Whiteland (T)	Major Business
Kohl's	229 W Lincoln Hwy	West Whiteland (T)	Major Business
Lnp Engineering Plastics Inc	475 Creamery Way	West Whiteland (T)	Major Business
Maxim Healthcare Services Inc	748 Springdale Dr # 120	West Whiteland (T)	Major Business
National Mail Graphic Corp	300 Old Mill Ln	West Whiteland (T)	Major Business
Neutronics Inc	465 Creamery Way	West Whiteland (T)	Major Business
Omega Flex Inc	451 Creamery Way	West Whiteland (T)	Major Business
On the Border Mexican Grill	102 Bartlett Ave	West Whiteland (T)	Major Business
Otto's Imported Cars Ltd BMW	305 W Lincoln Hwy	West Whiteland (T)	Major Business
Primepay	1487 Dunwoody Dr	West Whiteland (T)	Major Business
Sears	222 Exton Square Mall	West Whiteland (T)	Major Business
Service Master Co	623 Jeffers Cir	West Whiteland (T)	Major Business
Target	201 Sunrise Blvd	West Whiteland (T)	Major Business
The Grand Theatre Operating Company	110 Bartlett Ave	West Whiteland (T)	Major Business
Viac Services Company	1475 Dunwoody Dr	West Whiteland (T)	Major Business
Walmart	270 Indian Run St	West Whiteland (T)	Major Business
Weston Solutions Inc	1400 Weston Way	West Whiteland (T)	Major Business
Whitford Country Club	Whitford Hills Rd	West Whiteland (T)	Major Business
Whole Foods Market	175 N Pottstown Pike	West Whiteland (T)	Major Business
Giant Food Stores	40 S Village Ave	Westtown (T)	Major Business
Quality Inn-suites Conference	943 S High St	Westtown (T)	Major Business
American Institute for Cpcu	720 Providence Rd # 100	Willistown (T)	Major Business
Bryn Mawr Rehab Hospital	2 W Liberty Blvd	Willistown (T)	Major Business
Devereux Foundation Beneto Ctr	451 Creamery Way	Willistown (T)	Major Business
Institutes	720 Providence Rd	Willistown (T)	Major Business
Main Line Healthcare	2 Industrial Blvd	Willistown (T)	Major Business
Paoli Hospital	255 W Lancaster Ave	Willistown (T)	Major Business
White Manor Country Club	Providence Rd	Willistown (T)	Major Business
United States Marine Recruiting Office	110 Wallace Ave	Downingtown (B)	Military
PA National Guard Armory	1159 Rapps Dam Rd	East Pikeland (T)	Military
PA National Guard Armory	100 Armory Dr	East Vincent (T)	Military
PA National Guard Armory	150 Waverly Blvd	Sadsbury (T)	Military
Marine/USAF/Army Recruiting Office	720 E Market St	West Goshen (T)	Military
Atglen Post Office	316 Valley Av	Atglen (B)	Post Office
Avondale Post Office	112 Pennsylvania Av	Avondale (B)	Post Office
Thorndale Post Office	20 N Bailey Rd	Caln (T)	Post Office
Devault Post Office	4030 White Horse Rd	Charlestown (T)	Post Office
Coatesville Post Office	230 E Chestnut St	Coatesville (C)	Post Office
Lyndell Post Office	2 Lyndell Rd	East Brandywine (T)	Post Office
Downingtown Post Office	470 Boot Rd	East Caln (T)	Post Office
Parkerford Post Office	1355 Old Schuylkill Rd	East Coventry (T)	Post Office
Unionville Post Office	1752 W Doe Run Rd	East Marlborough (T)	Post Office
Kimberton Post Office	2102 Kimberton Rd	East Pikeland (T)	Post Office



Name	Address	Municipality	Bldg. Type
Frazer Post Office	490 Lancaster Av	East Whiteland (T)	Post Office
Berwyn Post Office	662 Lancaster Av	Easttown (T)	Post Office
Devon Post Office	7 N Waterloo Rd	Easttown (T)	Post Office
Lewisville Post Office	950 Chesterville Rd	Elk (T)	Post Office
Elverson Post Office	24 S Pine St	Elverson (B)	Post Office
Honey Brook Post Office	51 Pequea Av	Honey Brook (B)	Post Office
Suplee Post Office	913 Suplee Rd	Honey Brook (T)	Post Office
Mendenhall Post Office	330 Kennett Pk	Kennett (T)	Post Office
Kennett Square Post Office	222 E State St	Kennett Square (B)	Post Office
Lincoln University Post Office	301 Ashmun Av	Lower Oxford (T)	Post Office
Malvern Post Office	33 W King St	Malvern (B)	Post Office
Modena Post Office	108 N Brandywine Av	Modena (B)	Post Office
Landenberg Post Office	645 Penn Green Rd	New Garden (T)	Post Office
Toughkenamon Post Office	155 Center St	New Garden (T)	Post Office
Oxford Post Office	215 E Locust St	Oxford (B)	Post Office
Parkesburg Post Office	167 Brandt St	Parkesburg (B)	Post Office
Kelton Post Office	203 Corby Rd	Penn (T)	Post Office
Phoenixville Post Office	116 Gay St	Phoenixville (B)	Post Office
Pocopson Post Office	1110 Pocopson Rd	Pocopson (T)	Post Office
Pomeroy Post Office	44 Chestnut St	Sadsbury (T)	Post Office
Sadsburyville Post Office	2969 Lincoln Hwy	Sadsbury (T)	Post Office
Valley Forge Post Office	1721 Valley Forge Rd	Schuylkill (T)	Post Office
Spring City Post Office	124 New St	Spring City (B)	Post Office
Westtown Post Office	844 E Street Rd	Thornbury (T)	Post Office
Paoli Post Office	43 Paoli Plaza	Tredyffrin (T)	Post Office
Southeastern Postal Facility	1000 W Valley Rd	Tredyffrin (T)	Post Office
Uwchland Post Office	101 Fellowship Rd	Upper Uwchlan (T)	Post Office
Lionville Post Office	56 E Uwchlan Av	Uwchlan (T)	Post Office
Glenmoore Post Office	560 Fairview Rd	Wallace (T)	Post Office
Saint Peters Post Office	3380 Saint Peters Rd	Warwick (T)	Post Office
Brandamore Post Office	546 Hibernia Rd	West Brandywine (T)	Post Office
Wagontown Post Office	418 W Kings Hwy	West Caln (T)	Post Office
West Chester Post Office	101 E Gay St	West Chester (B)	Post Office
Cochranville Post Office	1030 Gap Newport Pk	West Fallowfield (T)	Post Office
West Chester Post Office	1050 Airport Rd	West Goshen (T)	Post Office
West Grove Post Office	5 Prospect Av	West Grove (B)	Post Office
Nottingham Post Office	127 Baltimore Pk	West Nottingham (T)	Post Office
Chester Springs Post Office	1214 Kimberto Rd	West Pikeland (T)	Post Office
Birchrunville Post Office	1405 Hollow Rd	West Vincent (T)	Post Office
Exton Post Office	430 Exton Square Pw	West Whiteland (T)	Post Office
Dilworthtown	1335 Wilmington Pike	Birmingham (T)	Radio Tower
Caln	251 Wallace Ave	Caln (T)	Radio Tower
Valley Hill	1046 Valley Hill Rd	Charlestown (T)	Radio Tower
Coatesville	519 Colfax St	Coatesville (C)	Radio Tower
Downingtown	63 Corner Ketch Rd	East Brandywine (T)	Radio Tower
King Ranch	775 Fairview Rd	East Fallowfield (T)	Radio Tower
East Nantmeal	3419 Conestoga Rd	East Nantmeal (T)	Radio Tower
Spring City	61 Dunlap Rd	East Vincent (T)	Radio Tower
Kemblesville	95 Parsons Rd	Franklin (T)	Radio Tower
Glen Run	451 Glen Run Rd	Highland (T)	Radio Tower
Octorara	550 W Lancaster Ave	Lower Oxford (T)	Radio Tower
Malvern	124 Ruthland Ave	Malvern (B)	Radio Tower
New Garden	1235 Newark Rd	New Garden (T)	Radio Tower
Norco	845 S Hanover Street	North Coventry (T)	Radio Tower
Chadds Ford	520 Baltimore Pike	Pennsbury (T)	Radio Tower
Phoenixville	401 Grant St	Phoenixville (B)	Radio Tower
Pocopson	501 S Wawaset Rd	Pocopson (T)	Radio Tower
Pocopson	501 S Wawaset Rd	Pocopson (T)	Radio Tower



Name	Address	Municipality	Bldg. Type
Valley Forge	1032 Horse Shoe Trail	Schuylkill (T)	Radio Tower
Fairview	700 Oak Street	South Coatesville (B)	Radio Tower
South Coatesville	137 Modena Rd	South Coatesville (B)	Radio Tower
Bucktown	3131 Coventryville Rd	South Coventry (T)	Radio Tower
Forestville	8 Dalin Drive	Upper Oxford (T)	Radio Tower
Upper Uwchlan	275 Fellowship Rd	Upper Uwchlan (T)	Radio Tower
Embreeville	997 Lieds Rd	West Bradford (T)	Radio Tower
Baron Hill	1398 Telegraph Rd	West Caln (T)	Radio Tower
Westtown	601 Westtown Rd	West Goshen (T)	Radio Tower
Elverson	19 Goodfellow Rd	West Nantmeal (T)	Radio Tower

Source: Chester County