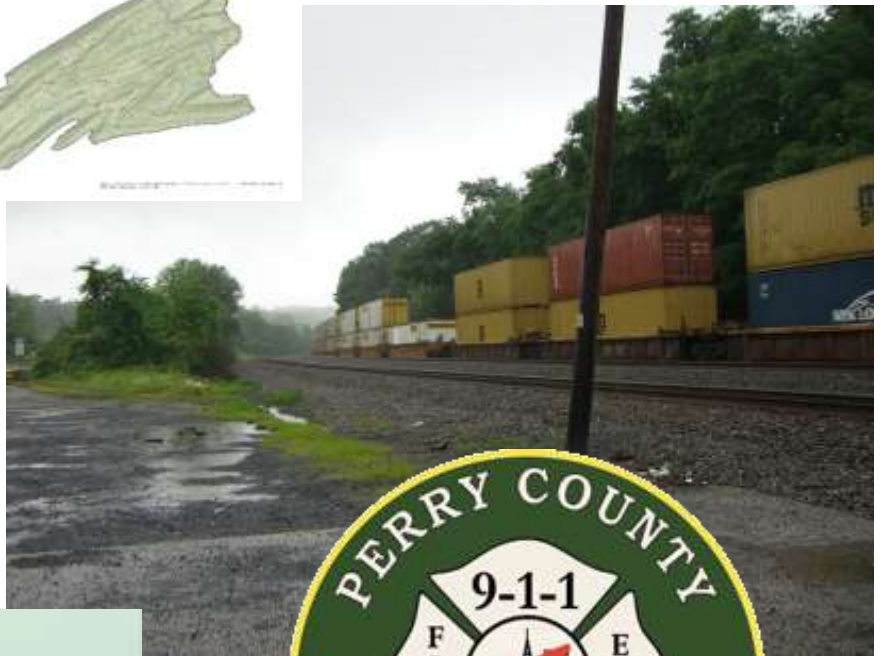


PERRY COUNTY MULTI-HAZARD MITIGATION PLAN



2020 (5-YR UPDATE)

PERRY COUNTY MULTI-HAZARD MITIGATION PLAN

2020

Effective Date:
August 24, 2020

COUNTY OF PERRY
Perry County Veterans Memorial Building
25 West Main Street
P.O. Box 37
New Bloomfield, PA 17068

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Executive Summary

Introduction

The principle intent of the Perry County Multi-Hazard Mitigation Plan (MHMP) is to make residents, businesses, property owners, operators of critical infrastructure, and the county's 30 municipalities less susceptible to the devastating effects of future disasters by improving disaster resiliency of all of the County's political jurisdictions. As with the initial County plan, this plan update is intended to be multi-jurisdictional in scope.

The MHMP serves as a framework for protecting lives, protecting assets and preserving the economic viability of the County's 30 municipalities. This planning initiative resulted in a comprehensive MHMP that meets all Federal Emergency Management Agency (FEMA) and Pennsylvania Emergency Management Agency (PEMA) requirements established in the Disaster Mitigation Act of 2000 (DMA 2000). The MHMP will help the county and its municipalities maintain their eligibility for certain future federal funding, especially the Hazard Mitigation Grant Program (HMGP). A FEMA-approved HMP is also required to participate in the Emergency Management Performance Grant programs (EMPG) and in projects under the Pre-Disaster Mitigation Grant Programs (PDM).

The Planning Process

Since 2008 when the initial plan was adopted, the plan has been kept current as some projects have migrated from planning text to implantation. On an annual basis municipalities have been encouraged to submit new project opportunity forms for inclusion in the plan as project solicitation continues follow an open-door approach.

The planning process for this MHMP involved a variety of key decision makers, stakeholders, and planning partners.

With the support of the Perry County Board of Commissioners the Tri-County Regional Planning Commission staff has worked to update this plan under its working agreement with the County for planning support services for the Perry County Planning Commission together with the County's Planning work program.

The Plan

The MHMP update for the most part follows the content of the initial plan with the exception of its organized design. After consideration of the top three hazards in the 2008 and 2014 HMP Plans, discussion with the Steering Committee, the public, select county offices (Commissioners, EMA/ 9-1-1), a thorough and historical research of past hazard impacts, and the inclusion of five new hazards.

With respect to content, the plan continues to cover both natural and human-introduced hazards.

EXECUTIVE SUMMARY

In terms of format, much of the document has been reversed to highlight projects in order to make the finished volume easier to work with on a daily basis. A significant portion of the DMA 2000 required elements will be contained in the Appendices.

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CHAPTER 1

INTRODUCTION

Background

In September of 2008 the Perry County Board of Commissioners adopted Perry County’s initial Multi-Hazard Mitigation Plan (MHMP). The plan was prepared in response to the Disaster Mitigation Act of 2000 (DMA) ¹ Perry County participated with a contiguous string of counties (Juniata and Mifflin) to seek assistance in the preparation of a three-county MHMP. Under Perry County’s lead, the Delta Development Group, Inc. was selected as the consultant to assist the counties in developing the three plans. The process culminated with all three counties adopting their plans followed a succession of approvals from the Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA).

In September of 2012 the County embarked upon its separate 5-yr Multi-Jurisdictional and Multi-Hazard Plan (MHMP) update process, as was the case for Juniata and Mifflin Counties. From the individual county approach the steering committee was inherently vested in projects here in Perry County. As such the process did not seem as diluted or watered down when it came to increasing the number of project additions, or direction for the plan.

TABLE 1.1

**PERRY COUNTY
MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN
STEERING COMMITTEE MEMBER NAMES AND THEIR OFFICE OR
AFFILIATION**

Grouping	Individual’s Name	Office or Affiliation
County Government	Steve Naylor	Perry County Board of Commissioners
County Government	Rich Fultz	Emergency Management Agency/ 9-1-1
County Government	Sally Tengeres	Perry County Conservation District
County Government	Gregory Wirth	Area Agency on Aging
Economic Development	Rich Pluta or Becky Kephart	Perry County Chamber of Commerce
Economic Development	Marti Roberts or Michelle Jones	Perry County Economic Development Authority
Education	Nicholas Guarente	Greenwood School District
Education	Ryan Neuhard	Newport School District
Education	Kent R. Smith	Susquenita School District
Education	Michael O’Brien	West Perry School District
Emergency Services	Kraig Nace	Duncannon EMS
Emergency Services	Mike Minich	Shermans Dale Fire Company
Energy	George Hower or Sugi Judd	PPL Electric Utilities
Energy	Justin Rose	Enbridge (Pipelines)

¹ Disaster Mitigation Act, Public Law 106-390, October 10, 2000

Energy	Christopher M. Brennan	Sunoco Logistics
Municipal Government	John McElhiney	Spring Township Planning Commission
Municipal Government	Dick Amsler	LEPC Representative
Municipal Government	Scott Weaver	Marysville Borough Manager
Municipal Government	Bob Hart	Municipal Zoning Officer
Municipal Government	James Fuller	Wheatfield Township Supervisor
Public Assistance	Kristin Daneker	Perry Human Services
Public Assistance	Michael J. Burns	Join Hands Ministries
Public Assistance	John Kiner or Linda Bates	Perry County Food Bank
Transportation	John Allison	Rhorer Bus Service
Transportation	Rich Farr or Perry Cook	Rabbitransit
Ad hoc participants/invitees		
County and Regional Government	Jason Finnerty	Perry County Planning Commission and Tri-County Regional Planning Commission
Technology	Dean Lusby	Perry County IT Consultant
Technology	Dave Unger	Perry County GIS Department
State Government	Ernie Szabo	PEMA
Federal Government	Mari Radford	FEMA

Dissected, this update to Perry County’s MHMP included a revisit to cover hazard vulnerability which includes the research to update the hazard profiles, new hazard identification and inclusion, risk assessment, including reassessing local capacity i.e. capability.

As structured, this plan lists the following MHMP Goals.

- Strengthen County and local capabilities to reduce the potential impacts of flooding on existing and future public/ private assets, including structures, critical facilities, and infrastructure.
- Increase intergovernmental cooperation and build public/ private partnerships to implement activities that will reduce the impact of natural, and manmade hazards including those of a technological origin.
- Enhance planning and emergency response efforts among state, county, and local emergency management personnel to protect public health and safety.
- Continue to build Perry County’s spatial information resources to strengthen public and private hazard mitigation planning and decision-support capabilities.
- Increase public awareness of both the potential impacts of all hazards and activities to reduce those impacts.

A substantial amount of time and effort has been made to solicit and gather projects from every corner of the county. As prepared, this plan will showcase the primary projects the county and its municipalities will strive to implement within the next five years.

Staff has met with groups of municipal officials in both formal and informal settings. A bold attempt was made to secure 100% participation from all the county’s municipal governing bodies. The difficulties faced range from the number of municipalities, travel distance and time, the plan’s development timeline, the frequency of monthly meetings, and the volume of material to cover. Of the thirty municipalities, over half meet on the same three days each month. Logistically speaking, meeting with each municipality the night of their monthly meeting would be an impossible undertaking.

The following table (TABLE 1.2) displays the final affirmation of this planning process.

TABLE 1.2
PERRY COUNTY
MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN
COUNTY AND MUNICIPAL PARTICIPATION AND RESOLUTION ADOPTION
DATES

Municipality	Initial 2008 MHMP Participant	Resolution Adopted	Resolution Date	2014 MHMP Update Participant	MHMP Resolution Adopted	Resolution Date	2019 MHMP Participant	Resolution Date
Perry County	Yes	Yes	08/11/2008	Yes	Yes	6/2/2014	Yes	8/24/2020
Blain Borough	Yes	Yes	10/02/2008	Yes	Yes	6/5/2014	Yes	9/10/2020
Bloomfield Borough	Yes	Yes	10/07/2008	Yes	Yes	7/1/2014	Yes	9/1/2020
Buffalo Township	Yes	No	-	Yes	Yes	8/4/2014	Yes	9/8/2020
Carroll Township	Yes	Yes	11/04/2008	Yes	No	-	Yes	-
Centre Township	Yes	Yes	10/07/2008	Yes	No	-	Yes	9/1/2020
Duncannon Borough	Yes	Yes	11/18/2008	Yes	No	-	Yes	9/15/2020
Greenwood Township	Yes	Yes	09/17/2008	Yes	No	-	Yes	8/19/2020
Howe Township	Yes	Yes	09/11/2008	Yes	Yes	8/7/2014	Yes	8/20/2020
Jackson Township	Yes	Yes	08/28/2008	Yes	Yes	6/26/2014	Yes	8/27/2020
Juniata Township	Yes	Yes	11/12/2008	Yes	Yes	6/11/2014	Yes	9/9/2020
Landisburg Borough	Yes	Yes	09/08/2008	Yes	No	-	Yes	9/14/2020
Liverpool Borough	Yes	No	-	Yes	No	-	Yes	8/19/2020
Liverpool Township	Yes	Yes	09/02/2008	Yes	Yes	7/7/2014	Yes	9/1/2020
Marysville Borough	Yes	Yes	09/08/2008	Yes	No	-	Yes	9/14/2020
Miller Township	Yes	Yes	08/26/2008	Yes	Yes	6/24/2014	Yes	8/25/2020
Millerstown Borough	Yes	Yes	10/06/2008	Yes	Yes	6/2/2014	Yes	9/14/2020

New Buffalo Borough	Yes	Yes	12/01/2008	Yes	No	-	Yes	-
Newport Borough	Yes	Yes	09/09/2008	Yes	Yes	6/17/2014	Yes	9/1/2020
Northeast Madison Township	Yes	Yes	09/02/2008	Yes	No	-	Yes	9/1/2020
Oliver Township	Yes	Yes	10/13/2008	Yes	Yes	6/9/2014	Yes	9/14/2020
Penn Township	Yes	Yes	08/27/2008	Yes	Yes	6/25/2014	Yes	8/26/2020
Rye Township	Yes	Yes	08/25/2008	Yes	Yes	6/23/2014	Yes	8/24/2020
Saville Township	Yes	Yes	10/06/2008	Yes	Yes	7/7/2014	Yes	9/8/2020
Southwest Madison Township	Yes	Yes	09/29/2008	Yes	No	-	Yes	9/28/2020
Spring Township	Yes	Yes	10/06/2008	Yes	No	-	Yes	9/8/2020
Toboyne Township	Yes	Yes	09/02/2008	Yes	No	-	Yes	9/14/2020
Tuscarora Township	Yes	Yes	10/17/2008	Yes	Yes	1/3/2017	Yes	8/20/2020
Tyrone Township	Yes	Yes	04/07/2009	Yes	No	-	Yes	9/1/2020
Watts Township	Yes	Yes	10/01/2008	Yes	Yes	8/6/2014	Yes	9/2/2020
Wheatfield Township	Yes	Yes	10/06/2008	Yes	Yes	8/4/2014	Yes	9/8/2020

Copies of each resolution as received by the County have been included in **Chapter 8. TABLE 1.2** can also be found in **Chapter 8**. In following with present day federal and state requirements, both FEMA and PEMA were provided the Final Plan for review and approval consideration.



Diagram 1.1: From the FEMA website: <http://www.fema.gov/rm-main>

Purpose

The purpose of Perry County’s Multi-Jurisdictional Hazard Mitigation Plan is to reduce the susceptibility of damage to real estate, critical facilities, and loss make residents, businesses,

property owners, due to hazards; thereby improving disaster resiliency in each of the County's political jurisdictions.

The MHMP serves as a framework for protecting lives, protecting assets and preserving the economic viability of the County's 30 municipalities. This planning initiative resulted in a comprehensive MHMP that meets all Federal Emergency Management Agency (FEMA) and Pennsylvania Emergency Management Agency (PEMA) requirements established in the Disaster Mitigation Act of 2000 (DMA 2000). The MHMP will help the county and its municipalities maintain their eligibility for certain future federal funding, especially the Hazard Mitigation Grant Program (HMGP). A FEMA-approved HMP is also required to participate in the Emergency Management Performance Grant programs (EMPG) and in projects under the Pre-Disaster Mitigation Grant Programs (PDM).

Local Hazard Mitigation Plan Requirements²

Local Hazard Mitigation Plan requirements in Section 201.6 of the Rule apply to both local jurisdictions and tribal governments that elect to participate in FEMA mitigation grant programs as a sub-applicant or sub-grantee (henceforth referred to as local jurisdictions). The local mitigation planning requirements in this section encourage agencies at all levels, local residents, businesses, and the nonprofit sector to participate in the mitigation planning and implementation process. This broad public participation enables the development of mitigation actions supported by these various stakeholders and reflects the needs of the community. Private-sector participation, in particular, may lead to identifying local funding that otherwise would not have been considered for mitigation activities.

As with state plans, the DMA 2000 requires local mitigation plans to only address natural hazards. However FEMA guidance recommends, local plans also address manmade hazards including those of a technological origin. This plan includes both natural and manmade hazards.

In many instances, natural disasters have secondary effects, such as dams breaking due to floods, or hazardous material releases due to tornadoes. Multi-hazard plans will better serve communities in the event such disasters occur.

States are required to coordinate with local governments in the formation of hazard mitigation strategies. Local strategies combined with initiatives at the state level form the basis for the state mitigation plan. With the information contained in local mitigation plans, states are better able to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare their plans, states can continually improve the level of detail and comprehensiveness of statewide risk assessments.

For the Pre-Disaster Mitigation (PDM) Program, local jurisdictions must have an approved mitigation plan to receive a project grant. Local jurisdictions must have approved plans by November 1, 2004, to be eligible for Hazard Mitigation Grant Program (HMGP) funding for presidentially declared disasters after this date. Plans approved after November 1, 2004, will enable eligible communities to receive PDM and HMGP project grants.

² Multi-Hazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000.

FEMA's Local Hazard Mitigation Plan Review Crosswalk (Plan Review Crosswalk) provides a checklist of HMP requirements and was used by the Perry County to ensure this document met the requirements for a Local Hazard Mitigation Plan. The Plan Review Crosswalk is based on the Multi-Hazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000, published by FEMA in March 2004. This Plan Review Crosswalk is consistent with the Disaster Mitigation Act of 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule (the Rule), published February 26, 2002.

Scope

The range or extent of this plan covers all of Perry County, Pennsylvania which encompasses an area of 551.45 square miles in size according to the 2010 US Census. The plan is multi-jurisdictional plan affording an opportunity for municipal officials from thirty municipalities to partner in this process. This focus has been present with the two previous plans and has served Perry County well.

Following this introduction, the MHMP looks at our areas community profile, and reveals our planning process. From there the plan provides a risk assessment of the hazards, and an evaluation of county and municipal capabilities. The functional content of the plan is contained within its mitigation strategy.

This plan represents the third in the series of Perry County's MHMPs and the second update of the plan. Work on the update was initiated in June 2018. Considering the second plan, only two on-the-ground projects remain incomplete at the time. These projects have been listed as carry over projects for inclusion in this plan in **Appendix E**.

The HMP update process has been orchestrated by the staff from the Tri-County Regional Planning Commission operating under the county support function of its contractual agreement with the Perry County Board of Commissioners for continued planning services.

As was the case with the first two plans, this county plan is intended to be multi-jurisdictional in scope. Simply put, all thirty of the county's municipalities have been involved in some way throughout the process and encouraged to sign formal resolutions adopting the plan as the official MHMP for their local jurisdiction. Of the thirty, municipalities, a few have signed local resolutions adopting the County MHMP. Copies of each signed document has been included in **Chapter 8** of this plan.

In addition to municipal participation, the plan was further complimented by a very diverse and knowledgeable steering committee. This group of individuals volunteered their time and energy, making them available for the staff to share its findings and help guide staff along the plan development process. Their diverse backgrounds truly complemented our process and facilitated work with this update to the plan. The following table (Table 1.1) lists the MHMP Steering Committee member names and affiliated organization.

Multi-Jurisdictional Plan Adoption

Requirement §201.6(c)(5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.³

A governing body's formal adoption of an HMP is a prerequisite to receiving FEMA's final approval. As such, the Board of Commissioners has approved this plan update with Resolution #2020-13 passed on August 24, 2020. Those municipal governing bodies choosing to remain partners at this point in time have executed their own resolutions proclaiming their approval and acceptance of this Multi-Jurisdictional Hazard Mitigation Plan. Copies of these resolutions are provided in **Chapter 8**.

Adoption of each HMP by the County and its municipalities will not only allow each political jurisdiction to be eligible for disaster mitigation grant funds; it will also provide each municipality with the knowledge of its level of susceptibility to various hazards and a blueprint for mitigating damaging effects.

Authority and Reference

At the federal level the underlying authority for this plan resides with the following federal acts, laws and regulations.

- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended.
- The Disaster Mitigation Act (DMA) of 2000, Public Law 106-390, as amended.
- Code of Federal Regulations (CFR), Title 44, Parts 79.4, 201 and 206

Considering the Commonwealth acts and codes, additional authority can also be found in the following

- Pennsylvania Emergency Management Services Code, Title 35, Chapter 73.
- Pennsylvania Municipalities Planning Code Act of 1968, P.L. 805, No. 247 as reenacted and amended.
- Pennsylvania Stormwater Management Act of 1978, P.L. 864, No. 167.

Regarding references and sources utilized in this plan text, the content can be found in Appendix A - Bibliography.

³ Federal Emergency Management Agency, *Plan Review Crosswalk*, Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000, March, 2004.

CHAPTER 2

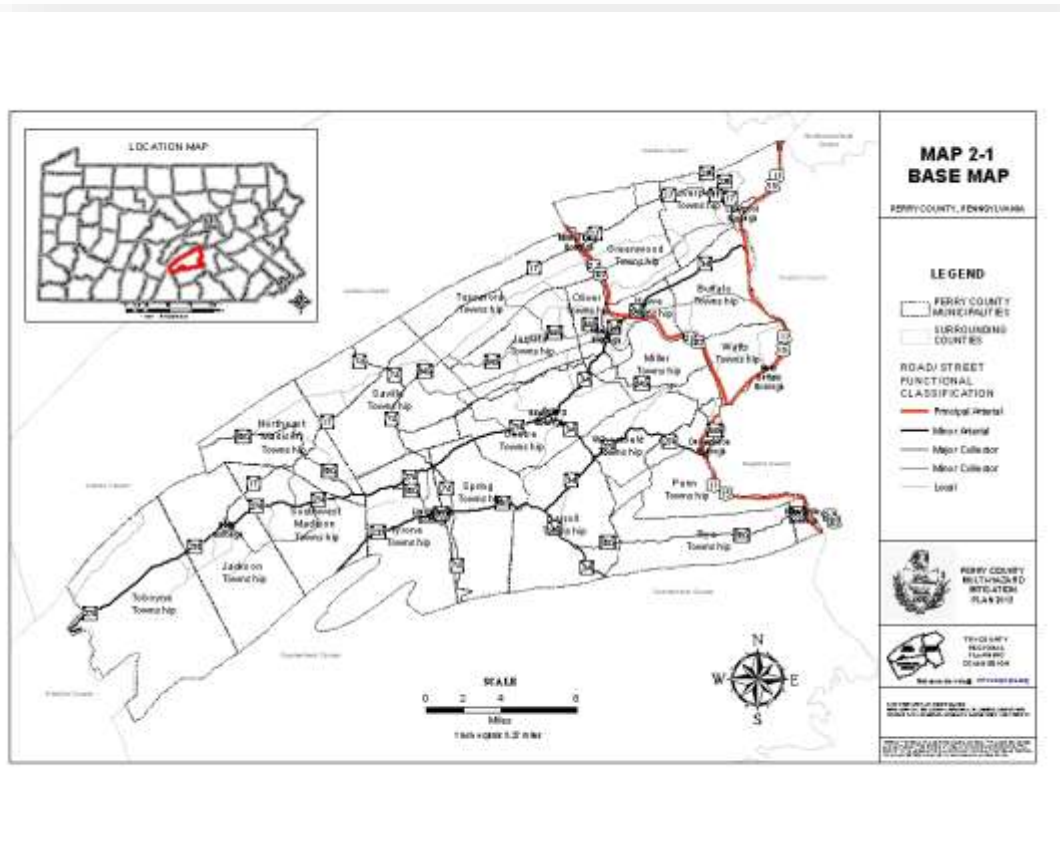
COMMUNITY PROFILE

Geography and Environment

This chapter of the plan is offered to better familiarize the reader with Perry County. Information contained herein includes such things as geography, environment, demographics, land use, economy, growth trends, and impervious coverage

In 1820, Perry County became the 51st Pennsylvania County. The name Perry was assigned in recognition of Commodore Oliver Perry an American naval hero of the War of 1812. Situated in what is considered South Central Pennsylvania, Perry County is also associated with the Tri-County Region.

MAP 2.1



Community Facts

The 2010 U.S. Census Bureau listed the Perry County as being 553.60 square miles in size. The County and its thirty municipalities are situated along the southern edge of the Appalachian mountain range. Along this boundary the Kittatiny Ridge serves to physically separate the County from Cumberland County to the south. From the southwest, the Conococheague, Big Round Top, Sherman, and the Little Round Top Mountains all serve to separate the County from Franklin County, a prominent feature. The Tuscarora Mountain runs

along the northwest side of the county running southwest to northeast. This land form separates Juniata County from Perry.

The Susquehanna River, for the most part, is the eastern border of Perry County. A small piece of Penn Township does, however, border Reed Township, Dauphin County, near Amity Hall. The Susquehanna River’s largest tributary is the Juniata River, which splits in Perry County and runs through a portion of the county into Juniata County.

The County seat is located in Bloomfield, in the central heart of the County.

TABLE 2.1

**MUNICIPAL PLANNING & CONSTRUCTION ENFORCEMENT INFORMATION
2019**

Municipality	Planning Commission	Zoning Ordinance	Comprehensive Plan	S&LD Ordinance	S&LD Approving Body	Act 537 Plan	**UCC Regulation
Blain Borough	No	No	No	No	County	No	Perry COG/ BIU
Bloomfield Borough	Yes	Yes (1980)	Yes (1975)	Yes (1975)	Municipality	Yes	Perry COG/ BIU
Buffalo Township	Yes	No	Yes (1995)	Yes (1986)	Municipality	No	Perry COG/ BIU
Carroll Township	Yes	Yes (2003)	Yes (1987)	Yes (2003)	Municipality	Yes	Perry COG/ BIU
Centre Township	Yes	No	No	Yes (1998)	Municipality	Yes	Perry COG/ BIU
Duncannon Borough	Yes	Yes (1996)	Yes (1984)	Yes (1982)	Municipality	Yes	Perry COG/ BIU
Greenwood Township	Yes	Yes (1997)	Yes (2008)	Yes (2001)	Municipality	No	Perry COG/ BIU
Howe Township	Yes	Yes (1998)	Yes (1988)	Yes (1985)	Municipality	No	Perry COG/ BIU
Jackson Township	No	No	No	No	County	No	Perry COG/ BIU
Juniata Township	Yes	Yes (1993)	Yes (1993)	Yes (2010)	Municipality	Yes	Perry COG/ BIU
Landisburg Borough	No	No	No	No	County	No	Perry COG/ BIU
Liverpool Borough	Yes	Yes (1991)	Yes (1973)	Yes (1974)	Municipality	Yes	Perry COG/ BIU
Liverpool Township	Yes	Yes (2002)	Yes (2002)	Yes (1994)	Municipality	Yes	Perry COG/ BIU
Marysville Borough	Yes	Yes (1995)	Yes (2003)	Yes	Municipality	Yes	Perry COG/ BIU
Miller Township	Yes	No	No	Yes	Municipality	No	Perry COG/ BIU
Millerstown Borough	No	Yes (1997)	Yes (2008)	No*	County	No	Perry COG/ BIU
New Buffalo Borough	No	No	Yes (1996)	No	County	Yes	Perry COG/ BIU
Newport Borough	Yes	Yes (2000)	Yes (1995)	Yes (1999)	Municipality	No	Perry COG/ BIU
Northeast Madison Township	No	No	Yes (2003)	No	County	No	Perry COG/ BIU
Oliver Township	Yes	No	No	Yes (1999)	Municipality	Yes	Perry COG/ BIU

Penn Township	Yes	Yes (2003)	Yes (2006)	Yes (1992)	Municipality	Yes	Glace Assoc., Inc.
Rye Township	Yes	Yes (2011)	Yes (1999)	Yes (1990)	Municipality	Yes	Perry COG/ BIU
Saville Township	Yes	No	No	Yes (2007)	Municipality	No	Perry COG/ BIU
Southwest Madison Township	No	No	Yes (2003)	No	County	No	Perry COG/BIU
Spring Township	Yes	No	Yes (1991)	Yes (1990)	Municipality	No	Perry COG/ BIU
Toboyne Township	No	No	No	No	County	No	Perry COG/ BIU
Tuscarora Township	Yes	Yes (1992)	Yes (2008)	Yes (1981)	Municipality	Yes	Perry COG/ BIU
Tyrone Township	Yes	Yes (1996)	Yes (1995)	Yes (1990)	Municipality	Yes	Perry COG/BIU
Watts Township	Yes	Yes (2001)	Yes (1997)	Yes (1980)	Municipality	No	Perry COG/ BIU
Wheatfield Township	Yes	Yes (1993)	Yes (1974)	Yes (1988)	Municipality	No	Perry COG/ BIU

Source: *Perry County Planning Commission/TCRPC Staff*

* *County acts on all subdivisions but borough zoning regulations apply and override county lot sizes, areas and setbacks*

** *UCC—Uniform Construction Code*

Perry County is also home to an extremely rare plant species in the Box Huckleberry. The county has two colonies of the plant.

The Juniata River passes through and connects with the Susquehanna which passes along the eastern edge of the county. The Shermans Creek is the largest stream in the county, accepting water from nearly half the county’s land area. The Susquehanna River runs along the eastern edge of the county and for the most part physically separates Dauphin County from Perry. The Reed Township area near the Clarkes Ferry Bridge is the only notable exception.

There are two major transportation routes traversing the County. SR 11/15 and US 22/322 provide the means by which fifteen to twenty-five thousand vehicles pass through the county each day.

A single railroad corridor serves to provide both passenger and freight movement. Norfolk-Southern serves to traffic freight and Amtrack’s “Pennsylvanian” route shares the same rail corridor.

Historic structures include the county’s covered bridges, the Rockville Bridge which is shared with Dauphin County. While these may be the most recognizable, there are many other historical structures within the County that have not achieved historical site designation status. There are also two historic districts on in Newport Borough and the other in Little Buffalo State Park.

In Perry County, there is a strong commitment by many local leaders to plan for their community’s future. **TABLE 2.1** displays the present levels of municipal planning commitment.

Population and Demographics

Perry County is considered a suburban bedroom community primarily serving the Harrisburg and Carlisle Metropolitan Statistical Area. In 2010, the County's population was 45,969 persons. The number represented a 2,367 person increase since year 2000. The population increase moved Perry County from a 7th to a 6th class county. TABLE 2.2 offers over a half century's worth of the municipal population totals from the US Census Bureau spanning from 1940 to 2010. From these numbers a noteworthy reversal of sorts was witnessed in the 2010 US Census figures, with only one of the county's nine boroughs losing population during the last decade. With the US Decennial Census less than a year away, the latest set of American Community Survey estimates have also been included.

TABLE 2.2

**TRENDS OF POPULATION BY MUNICIPALITY
1940 - 2016**

Municipality	1940	1950	1960	1970	1980	1990	2000	2010	2016 Estimates*
Blain Borough	280	315	336	287	274	266	252	263	264
Bloomfield Borough	858	1,098	987	1,032	1,109	1,092	1,077	1,247	1,483
Buffalo Township	443	539	598	599	902	1,080	1,128	1,219	1,155
Carroll Township	1,123	1,287	1,534	1,904	3,173	4,597	5,095	5,269	5,255
Centre Township	793	844	880	1,109	1,663	1,974	2,209	2,491	2,602
Duncannon Borough	1,707	1,852	1,800	1,739	1,645	1,450	1,508	1,522	1,471
Greenwood Township	704	690	685	747	947	943	1,010	998	980
Howe Township	300	326	353	397	460	459	493	393	377
Jackson Township	491	427	378	413	437	489	525	547	521
Juniata Township	699	696	751	800	1,046	1,278	1,359	1,412	1,270
Landisburg Borough	266	279	285	269	227	178	195	218	225
Liverpool Borough	607	654	894	847	809	934	876	955	784
Liverpool Township	515	521	546	553	781	915	966	1,057	1,042
Marysville Borough	1,882	2,158	2,580	2,328	2,452	2,425	2,306	2,534	2,534
Miller Township	282	298	344	458	660	894	953	1,098	953
Millerstown Borough	684	682	675	612	550	646	679	673	745
New Buffalo Borough	101	155	153	150	156	145	123	129	112
Newport Borough	1,897	1893	1,861	1,747	1,600	1,568	1,506	1,574	1,486
Northeast Madison Township	489	433	428	419	564	674	856	786	775
Oliver Township	1,114	1,215	1,239	1,557	1,749	2,039	2,061	1,931	1,993
Penn Township	1,205	1,603	2,072	2,269	2,841	3,283	3,031	3,225	3,213
Rye Township	526	690	832	1,316	1,642	2,136	2,327	2,364	2,446
Saville Township	1,291	1,299	1,244	1,200	1,622	1,818	2,204	2,502	2,513
Southwest Madison Township	660	540	567	537	658	745	856	999	1,270
Spring Township	927	922	944	1,070	1,537	1,665	2,021	2,208	2,062
Toboyne Township	421	343	338	292	402	455	494	443	427
Tuscarora Township	674	708	665	624	884	1,034	1,122	1,189	1,244
Tyrone Township	1,319	1,136	1,147	1,430	1,590	1,741	1,863	2,124	1,953

Watts Township	347	425	520	613	962	1,152	1,196	1,265	1,374
Wheatfield Township	608	754	947	1,297	2,376	3,097	3,329	3,334	3,329
PERRY COUNTY	23,213	24,782	26,582	28,615	35,718	41,172	43,602	45,969	45,878

SOURCE: U.S. Census Bureau, Census of Population and Housing, 1940-2010
 *U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

Age Distribution

The following table (TABLE 2.3) displays the current population by age group. The subsequent graph (GRAPH 2.1) provides a visual of the age groupings coupled with gender information.

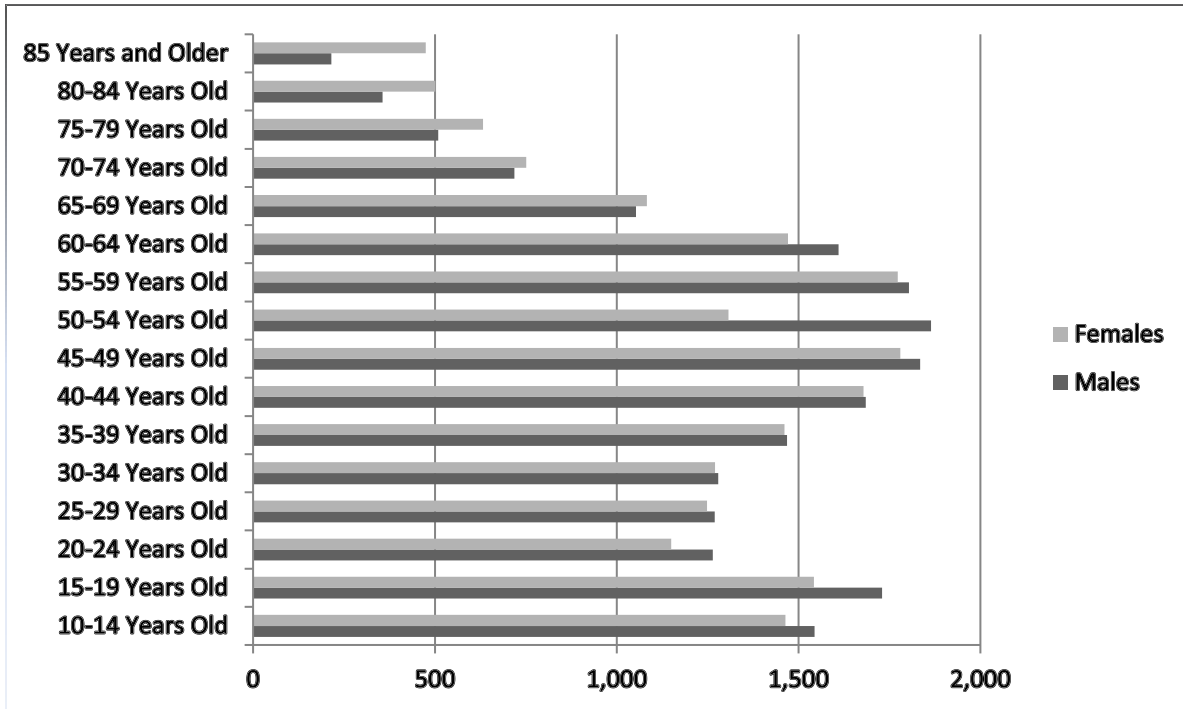
TABLE 2.3
TOTAL PERRY COUNTY POPULATION BY AGE GROUP
2000 - 2016

Age Group	2000 Population	2010 Population	2016 ACS Estimated Population*	2000 Percentage	2010 Percentage	2016 ACS Estimate Percentage*
0-4 Years Old	2,664	2,761	2,629	6.1	6.0	5.7
5-9 Years Old	3,088	2,818	2,565	7.1	6.1	5.6
10-14 Years Old	3,333	3,008	2,914	7.6	6.5	6.4
15-19 Years Old	3,107	3,272	2,785	7.1	7.1	6.1
20-24 Years Old	2,157	2,414	2,626	4.9	5.3	5.7
25-34 Years Old	5,692	5,066	5,218	13.1	11.0	11.4
35-44 Years Old	7,286	6,293	5,463	16.7	13.7	11.9
45-54 Years Old	6,771	7,385	6,932	15.5	16.1	15.1
55-59 Years Old	2,383	3,577	3,467	5.5	7.8	7.6
60-64 Years Old	1,776	3,081	3,540	4.1	6.7	7.7
65-74 Years Old	3,016	3,606	4,743	6.9	7.8	10.3
75-84 Years Old	1,787	1,998	2,117	4.1	4.4	4.6
85 Years and Older	542	690	879	1.2	1.5	1.9

SOURCE: U.S. Census Bureau, Census of Population and Housing, 2000 and 2010
 *U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

GRAPH 2.1

**POPULATION BY GENDER AND BY AGE GROUP
PERRY COUNTY
2010**



SOURCE: U.S. Census Bureau, Census of Population and Housing, 2010

The population trends of median age in Perry County are comparable to statewide trends from 1970-2010 (TABLE 2.4). The increases are further evidence of the effect the “baby boom” and the “echo boom” generations are having on Perry County’s population.

TABLE 2.4
MEDIAN AGE BY GENDER
PERRY COUNTY COMPARED TO PENNSYLVANIA
1970-2010 WITH 2016 ACS ESTIMATE

Year	PERRY COUNTY			PENNSYLVANIA		
	All Persons	Male	Female	All Persons	Male	Female
1970	29.2	28.1	30.3	30.7	29.1	32.1
1980	30.0	29.4	30.7	32.1	30.4	33.6
1990	33.4	*	*	35.1	33.6	36.7
2000	37.5	37.0	38.0	38.0	36.5	39.4
2010	41.1	40.4	41.8	41.1	40.4	41.8
2016 ACS Estimate*	43.0	Not available	Not available	40.7	Not available	Not available

SOURCE: U.S. Census Bureau, Census of Population and Housing, 1970-2010

*U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

* Not collected or calculated

Race

In 2010, 98.5 percent of the Perry County population born of a single race was white. There were only 296 or 0.6 percent listed as black, up from 95 in 1990 and 189 in 2000. Of the other racial groups, there were 72 American Indians and Alaskan Natives, 164 Asians and 19 Native Hawaiian & other Pacific Islanders in 2010. TABLE 2.5 displays the recognized changes in the County’s racial composition in 2000 and 2010.

TABLE 2.5
POPULATION COMPOSITION BY RACE
PERRY COUNTY
2000-2010

Race	2000 Census	2010	2016 ACS Estimates*
One Race	**	99.0	98.9
White	98.5	99.97	97.2
Black or African American	0.2	0.6	0.9
American Indian and Alaska Native	0.1	0.2	0.2
Native Hawaiian and Other Pacific Islander	0.2	0.4	0.0
Hispanic or Latino Origin	0.7	1.3	1.8
Two or More Races	0.8	1.0	1.0

SOURCE: U.S. Census Bureau, Census of Population and Housing, 2000 and 2010

*U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

** Not Collected

Income

Median household income statistics provide a means for comparing incomes of a given population. A wide range exists in median income among the Perry County municipalities.

Proximity to the Harrisburg urbanized area is also reflected in the distribution of median income levels, similar to the per capita income trend. The median household income of Perry County residents increased from \$29,539 in 1990 to \$41,909 in 2000—an increase of 41.9 percent. TABLE 2.6 indicates an increase to \$52,659.00 in 2010, of 44.8 percent.

Coinciding with the continued increase in population over nearly the last century, so too has the number of individuals living below the poverty level. Persons below the poverty level increased from 7.4 percent in 1990 to 7.7 percent in 2000, with an increase to 9.1 in 2010. It is foreseeable this continued trend could overburden many fiscally constrained social programs in the County as demands placed on these programs will undoubtedly increase. Families below the poverty level decreased from 6.2 percent in 1990 to 5.4 percent in 2000, however rose to 6.5 percent in 2010.

TABLE 2.6

**MEDIAN HOUSEHOLD INCOME AND POVERTY
PERRY COUNTY MUNICIPALITIES
2000-2010**

Municipality	INCOME Household (Median)		POVERTY			
			% of People Below		% of Families Below	
	2000	2010	2000	2010	2000	2010
Blain Borough	\$32,500	\$47,222	12.6	3.5	11.6	3.3
Bloomfield Borough	\$39,018	\$62,031	7.6	2.6	6.0	0.9
Buffalo Township	\$47,011	\$63,438	4.6	3.9	3.1	2.3
Carroll Township	\$45,011	\$57,727	4.5	10.1	3.0	6.1
Centre Township	\$43,900	\$60,987	6.1	1.3	3.8	0.0
Duncannon Borough	\$33,000	\$55,833	8.5	9.3	6.2	6.0
Greenwood Township	\$45,694	\$63,413	6.5	6.4	2.1	5.2
Howe Township	\$46,563	\$50,625	4.0	4.8	4.8	2.5
Jackson Township	\$37,054	\$41,944	18.2	7.9	11.6	6.5
Juniata Township	\$47,174	\$67,375	5.5	12.9	3.6	10.5
Landisburg Borough	\$31,563	\$60,625	9.4	2.6	6.8	0.0
Liverpool Borough	\$33,850	\$49,583	10.2	8.2	7.3	4.4
Liverpool Township	\$41,389	\$69,474	4.3	2.6	1.9	0.8
Marysville Borough	\$40,446	\$57,539	6.8	10.0	5.2	7.3
Miller Township	\$45,167	\$33,875	10.1	24.6	7.3	23.8
Millerstown Borough	\$43,750	\$64,821	5.0	3.9	2.0	2.0
New Buffalo Borough	\$31,250	\$53,594	22.0	4.9	20.6	0.0
Newport Borough	\$31,594	\$46,607	10.0	21.1	6.8	19.8
Northeast Madison Township	\$37,125	\$53,750	19.0	20.8	15.0	18.1
Oliver Township	\$39,063	\$43,750	12.4	16.3	10.4	18.9
Penn Township	\$43,198	\$49,522	5.4	8.6	4.6	6.9
Rye Township	\$56,375	\$77,919	3.7	1.4	2.6	0.0
Saville Township	\$39,975	\$54,708	8.3	10.7	6.1	8.9
Southwest Madison Township	\$35,694	\$43,750	18.8	13.8	13.2	11.5
Spring Township	\$48,594	\$56,172	7.5	7.6	5.1	4.4
Toboyne Township	\$30,833	\$37,500	18.4	5.2	11.5	0.0
Tuscarora Township	\$40,813	\$45,536	8.9	9.4	5.6	5.4

Tyrone Township	\$38,276	\$45,096	9.0	17.4	6.5	11.1
Watts Township	\$44,583	\$55,192	4.0	7.3	3.9	4.5
Wheatfield Township	\$44,010	\$66,731	7.7	3.6	5.4	1.1
TOTAL COUNTY	\$41,909.00	\$52,659.00	7.7	9.1	5.4	6.5

SOURCE: U.S. Census Bureau, 2000 and 2010 Census of Population and Housing

Employment by Place of Work

The following table (TABLE 2.7) illustrates the employment locations of the Perry County workforce from the 2000 Census and the 2006-2010 5-Year Estimates of the American Community Survey.

These numbers reflect employment opportunities are more abundant in areas outside Perry County, primarily in the Harrisburg urbanized area. It appears that the job market in Perry County has not expanded at the same rate as its population. It seems that the residents in-migrating to the County maintain their employment in the adjacent Harrisburg metro job market. This trend supports the argument that population growth does not necessarily spur economic growth in the same area. The numbers have changed since 1990. However these ratios have remained relatively the same. Continued population growth should encourage some expansion of the economic base, leading to increased job opportunities within the County. However, it seems the Harrisburg job market will continue to dominate as the major employment market for Perry County residents.

TABLE 2.7

**PERRY COUNTY EMPLOYMENT BY INDUSTRY
PERSONS 16 YEARS AND OLDER
1990-2010 WITH 2016 AMERICAN COMMUNITY SURVEY (ACS) ESTIMATES**

Industry	1990	2000	2010	Percentage Employed 2010	Percentage Change 1990-2010	2016 ACS Estimates*
Agriculture, forestry, fishing and hunting, and mining	837	629	612	2.7%	-26.9%	594
Construction	1,754	1,914	2,053	9.1%	17.1%	2,384
Manufacturing	3,177	2,620	1,955	8.6%	-38.5%	1,913
Wholesale trade	966	1,058	871	3.8%	-9.8%	662
Retail trade	3,175	2,591	2,835	12.5%	-10.7%	2,818
Transportation and warehousing, and utilities	1,561	2,152	2,387	10.5%	52.9%	2,180
Information	388	357	391	1.7%	0.8%	281
Finance, Insurance, Real Estate, and Rental and Leasing	1,566	1,846	1,818	8.0%	16.1%	1,725

Professional, scientific, management, administrative, and waste management services	3,335	1,176	1,794	7.9%	-46.2% *	1,665
Educational, health and social services	**	3,349	4,003	17.7%	Not available	4,334
Arts, entertainment, recreation, accommodation and food services	397	1,054	1,030	4.5%	74.6%	1,245
Other services (except public administration)	849	1,050	1,100	4.9%	29.6%	1,120
Public administration	2,071	1,944	1,809	8.0%	-12.7%	2,062
TOTAL	20,076	21,740	22,658	100.0%	8.3%	22,983

SOURCE: U.S. Census Bureau, 1990 & 2000; 2006-2010 American Community Service 5-Year Estimates

* The large decrease in the professional sector is due to the fact that the education sector was previously classified in the profession sector but is now classified in its own sector.

** Educational, health and social services was not identified as an industry in the 1990 U.S. Census

*** 2006-2010 American Community Survey (ACS)

The following table (TABLE 2.8) displays estimates for businesses within Perry County.

TABLE 2.8

**PERRY COUNTY EMPLOYMENT ESTABLISHMENTS BY INDUSTRY
CONSIDERING 2016 AMERICAN COMMUNITY SURVEY (ACS) ESTIMATES**

Industry	2016 ACS Estimated Number of Establishments
Agriculture, Forestry, Fishing, and Hunting	3
Mining, Quarrying, and Oil and Gas Extraction	2
Utilities	3
Construction	131
Manufacturing	39
Wholesale Trade	19
Retail Trade	136
Transportation and Warehousing	37
Information	7
Finance and Insurance	42
Real Estate, Rental, and Leasing	13
Professional, Scientific and Technical Services	44
Management of Companies	1
Administrative and Support and Waste Management and Remediation Services	36
Educational Services	10
Healthcare and Social Assistance	74
Arts, Entertainment and Recreation	7
Accommodation and Food Services	66
Other Services (Except Public Administration)	120
TOTAL (ALL COUNTY ESTABLISHMENTS)	790

SOURCE: U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

Table 2.9 displays the number of employees for each of the Perry County employment establishments. It is noted certain conditions lead to the information being withheld to avoid disclosing data on individual companies.

TABLE 2.9

**PERRY COUNTY EMPLOYMENT ESTABLISHMENTS BY INDUSTRY
CONSIDERING 2016 AMERICAN COMMUNITY SURVEY (ACS) ESTIMATES**

Industry	Number of Establishments
Agriculture, Forestry, Fishing, and Hunting	4
Mining, Quarrying, and Oil and Gas Extraction	*
Utilities	**
Construction	548
Manufacturing	624
Wholesale Trade	132
Retail Trade	1,208
Transportation and Warehousing	1,060
Information	44
Finance and Insurance	258
Real Estate, Rental, and Leasing	26
Professional, Scientific and Technical Services	171
Management of Companies	*
Administrative and Support and Waste Management and Remediation Services	137
Educational Services	67
Healthcare and Social Assistance	977
Arts, Entertainment and Recreation	11
Accommodation and Food Services	508
Other Services (Except Public Administration)	446
TOTAL (ALL COUNTY ESTABLISHMENTS)	6,247

SOURCE: U.S. Census Bureau, U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates for 2016

*Range of 0-19 employees
**Range of 20-99 employees

Land Use and Development

In consideration of Perry County’s largest land use, forestry contributes greatly to the local economy. Forest resources are used by many within and outside the county. As the county’s largest land use, the resources yielded by the industry contribute greatly to the economy. Due largely to the topographic features and development limitations/ constraints within the county, public and private forest holdings continue to dominate the county landscape and its open space.

As the county’s second largest land use category, the agricultural heritage that exists must not be overlooked. Farmers have helped to maintain a fabric of open space through the County. The farming community’s contributions are immense when one considers their reinvestment

within communities. The time and toil of raising animals and crops commands this deserved recognition.

Over the past ten years, Perry County has witnessed slight increases in residential, commercial, and industrial land uses. Table 2.10 present the land use and land cover classifications in Perry County. The Tuscarora State Forest, which spans four municipalities in Perry County, contains a majority of the land categorized in the public/semi-public land use category. Perry County’s top land use and land cover categories shown in Table 2.10 below are forest, agricultural, and residential land which combined comprise approximately 95% of the county’s total acreage.

TABLE 2.10
PERRY COUNTY LAND USE AND LAND COVER, 2012

Land Use/Land Cover Classification	2012 (acres)	Percentage of Total Acreage
Agricultural	17,192.39	28%
Barren Land	2,043.64	1%
Commercial and Services	229.32	< 1%
Forested	221,215.71	62%
Industrial	136.63	< 1%
Public/Semi-Public	887.26	< 1%
Recreational	949.99	< 1%
Residential	17,530.57	5%
Transportation, Communications and Utilities	5,294.34	1%
Water	3,367.27	1%

throughout the Commonwealth has been population reductions in boroughs and population increases in townships.

Six of the nine boroughs in Perry County lost population between 1990 and 2000 and three boroughs with growth saw no more than a 9.5 percent increase. Liverpool Borough experienced a decrease of 6.6 percent, while the other boroughs experienced an average decrease of 4.0 percent.

TABLE 2.11

**PERRY COUNTY AND MUNICIPAL POPULATIONS
AND PERCENTAGE CHANGE
2000-2010**

2000-2010 Geographic Area	2000 Population	2010 Population	2000-2010 Population Change	2000-2010 Percent Change
Blain Borough	252	263	11	4.4%
Bloomfield Borough	1,077	1,247	170	15.8%
Buffalo Township	1,128	1,219	91	8.1%
Carroll Township	5,095	5,269	174	3.4%
Centre Township	2,209	2,491	282	12.8%
Duncannon Borough	1,508	1,522	14	0.9%
Greenwood Township	1,010	998	-12	-1.2%
Howe Township	493	393	-100	-20.3%
Jackson Township	525	547	22	4.2%
Juniata Township	1,359	1,412	53	3.9%
Landisburg Borough	195	218	23	11.8%
Liverpool Borough	876	955	79	9.0%
Liverpool Township	966	1,057	91	9.4%
Marysville Borough	2,306	2,534	228	9.9%
Miller Township	953	1,098	145	15.2%
Millerstown Borough	679	673	-6	-0.9%
New Buffalo Borough	123	129	6	4.9%
Newport Borough	1,506	1,574	68	4.5%
Northeast Madison Twp.	856	786	-70	-8.2%
Oliver Township	2,061	1,931	-130	-6.3%
Penn Township	3,013	3,225	212	7.0%
Rye Township	2,327	2,364	37	1.6%
Saville Township	2,204	2,502	298	13.5%
Southwest Madison Township	856	999	143	16.7%
Spring Township	2,021	2,208	187	9.3%
Toboyne Township	494	443	-51	-10.3%

Tuscarora Township	1,122	1,189	67	6.0%
Tyrone Township	1,863	2,124	261	14.0%
Watts Township	1,196	1,265	69	5.8%
Wheatfield Township	3,329	3,334	5	0.2%
PERRY COUNTY	43,602	45,969	2,367	5.4%

SOURCE: U.S. Census Bureau, Census of Population and Housing, 2000-2010

TABLE 2.12

PERRY COUNTY AND MUNICIPAL POPULATION PROJECTIONS AND ALLOCATIONS

2015 - 2035 Municipality	2010 Actual	2015	2020	2025	2030	2035	Numeric Change 2010-2035	Percentage Change 2010-2035
Blain Borough	263	246	247	247	248	248	-15	-5.7
Bloomfield Borough	1,247	1,090	1,098	1,106	1,109	1,111	-136	-10.9
Buffalo Borough	1,219	1,135	1,147	1,157	1,160	1,163	-56	-4.6
Carroll Township	5,269	5,294	5,363	5,425	5,443	5,462	193	3.7
Centre Township	2,491	2,259	2,289	2,316	2,324	2,332	-159	-6.4
Duncannon Borough	1,522	1,495	1,502	1,508	1,509	1,511	-11	-0.7
Greenwood Township	998	1,044	1,054	1,063	1,065	1,068	70	7.0
Howe Township	393	492	496	500	501	502	109	27.7
Jackson Township	547	540	545	550	551	553	6	1.1
Juniata Township	1,412	1,427	1,445	1,460	1,465	1,470	58	4.1
Landisburg Borough	218	190	190	191	191	191	-27	-12.4
Liverpool Borough	955	883	889	894	895	897	-58	-6.1
Liverpool Township	1,057	972	982	991	994	997	-60	-5.7
Marysville Borough	2,534	2,424	2,447	2,467	2,474	2,480	-54	-2.1
Miller Township	1,098	982	999	1,013	1,017	1,022	-76	-6.9
Millerstown Borough	673	681	686	690	692	693	20	3.0
New Buffalo Borough	129	120	121	122	122	122	-7	-5.4
Newport Borough	1,574	1,466	1,471	1,476	1,478	1,479	-95	-6.0
Northeast Madison Township	786	861	871	880	883	885	99	12.6
Oliver Township	1,931	2,055	2,072	2,088	2,092	2,097	166	8.6
Penn Township	3,225	3,132	3,159	3,183	3,190	3,198	-27	-0.8
Rye Township	2,364	2,447	2,471	2,492	2,498	2,504	140	5.9
Saville Township	2,502	2,289	2,318	2,343	2,351	2,359	-143	-5.7
Southwest Madison Township	999	872	882	891	894	896	-103	-10.3
Spring Township	2,208	2,082	2,107	2,129	2,136	2,143	-65	-2.9
Toboyne Township	443	499	506	511	513	515	72	16.3
Tuscarora Township	1,189	1,182	1,196	1,209	1,212	1,216	27	2.3
Tyrone Township	2,124	1,852	1,864	1,875	1,878	1,881	-243	-11.4
Watts Township	1,265	1,222	1,235	1,248	1,251	1,255	-10	-0.8
Wheatfield Township	3,334	3,419	3,457	3,492	3,502	3,512	178	5.3
PERRY COUNTY	45,969	44,656	45,111	45,517	45,638	45,759	-210	-0.5

SOURCES: U.S. Census Bureau, Census of Population and Housing, 2010, and Pennsylvania State Data Center (County Projections), and TCRPC (Municipal Allocations)

Housing

TABLE 2.13 presents the age of the housing structures in Perry County. Of the 18,941 total housing units recorded in the 2000 U.S. Census, over 9,000 were built prior to 1969. More than 27 percent of the current total housing stock was built prior to 1940.

Figure 2.14 presents the historical trends in the number of housing units in Perry County and projections through 2020. These projections were based on a 5 percent vacancy rate. Perry County did witness an 11 percent increase in the number of housing units between 1990 and 2000. The number of housing units within Perry County is projected to rise steadily through 2020 as the population also increases.

TABLE 2.13
PERRY COUNTY
HOUSING UNITS BY YEAR STRUCTURE WAS BUILT

Year Structure Was Built	Number of Structures	Percentage
2005 or later	647	3%
2000 to 2004	1,036	5.0%
1990 to 1999	3,064	15%
1980 to 1989	3,039	15%
1970 to 1979	3,298	16%
1960 to 1969	1,443	7%
1950 to 1959	1,578	8%
1940 to 1949	812	4%
1939 or Earlier	5,437	27%
Total	20,354	100%

SOURCE: U.S. Census, 2007- 2011 American Community Survey 5-Year Estimates (Inclusive of seasonal dwellings)

TABLE 2.14
PERRY COUNTY HOUSING NEEDS
2005-2020

Municipalities	2000 US Census	Forecasted Housing Needs (Based on an Ideal 5% Vacancy Rate)			
		2005	2010	2015	2020
Blain Borough	102	6	8	9	10
Bloomfield Borough	425	43	59	71	79
Buffalo Township	472	65	88	105	118
Carroll Township	2,036	405	538	642	719
Centre Township	897	192	250	295	328
Duncannon Borough	714	42	60	73	83
Greenwood Township	409	60	77	90	100
Howe Township	275	25	34	41	47
Jackson Township	264	25	33	38	42
Juniata Township	538	100	130	153	170
Landisburg Borough	89	-4	-3	-3	-2

Liverpool Borough	450	36	53	66	76
Liverpool Township	402	62	81	95	106
Marysville Borough	1,103	86	119	145	164
Miller Township	425	74	104	128	145
Millerstown Borough	292	31	42	50	55
New Buffalo Borough	59	5	6	7	8
Newport Borough	743	-3	10	20	28
Northeast Madison Township	400	47	65	78	88
Oliver Township	858	135	178	212	237
Penn Township	1,242	167	224	269	302
Rye Township	872	174	222	259	286
Saville Township	984	161	213	253	282
Southwest Madison Township	395	49	64	76	85
Spring Township	815	145	192	230	257
Toboyne Township	541	37	49	59	67
Tuscarora Township	539	60	85	104	118
Tyrone Township	835	97	126	148	165
Watts Township	482	79	103	121	135
Wheatfield Township	1,283	248	325	385	430
TOTALS	18,941	2,698	3,594	4,297	4,813

SOURCES: U.S. Census Bureau (1990 data) and Tri-County Regional Planning Commission (Forecasted Need)

Impervious Surface Coverage

The analysis of changes to impervious surface is a crucial layer to use when evaluating stormwater runoff.

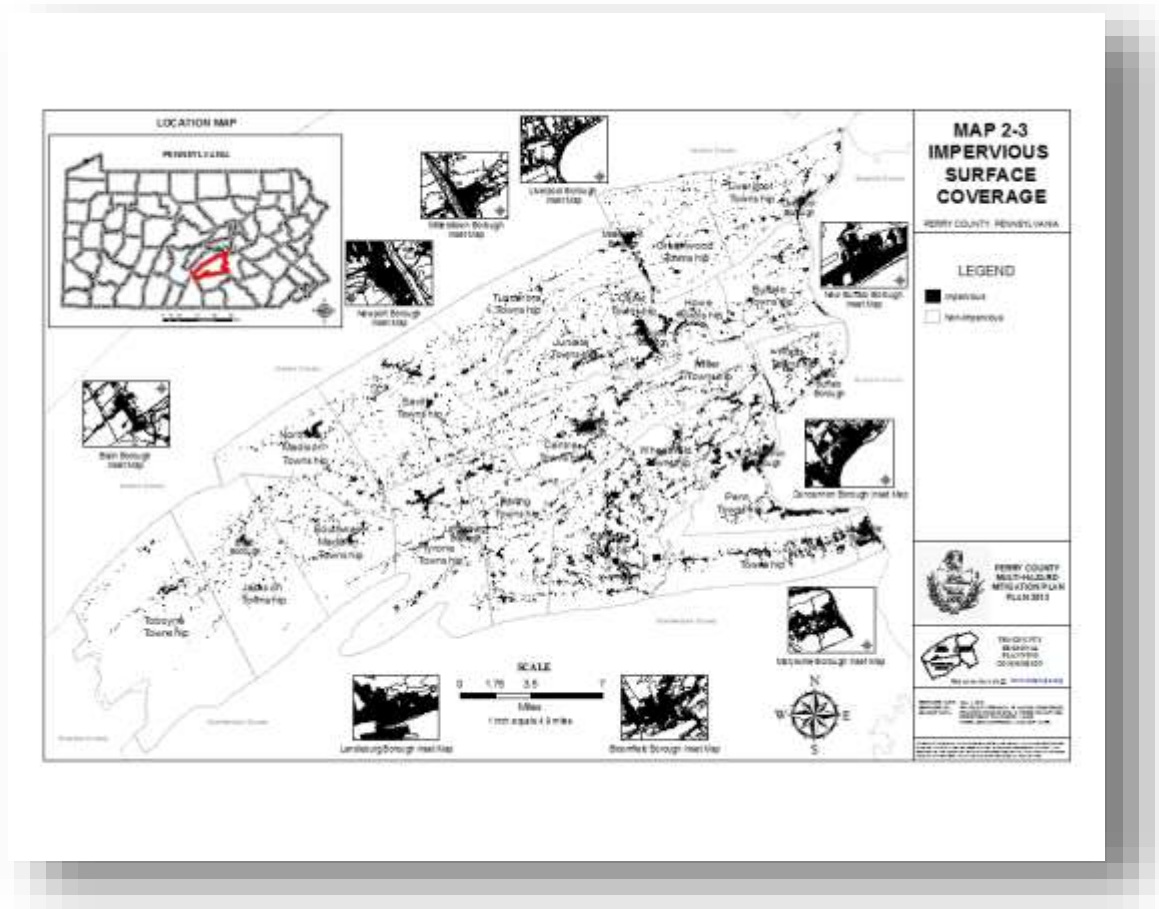
The addition of impervious surfaces to a landscape can pose a host of hazard related issues. These include:

- Flooding by way of additional stormwater runoff; and
- Contributions to climate change which could in turn contribute to drought and severe weather from increases in temperature.

The frequencies of certain hazards are dependent upon the location where unmitigated impervious surface is added.

MAP 2.3 provides a generalized image of areas where impervious surface exists within Perry County. The limitations associated with the map are mentioned at the end of this chapter.

MAP 2.3



SOURCE: PCPC/TCRPC, May 1, 2013

Climate and Weather

The Koppen-Geiger Climate Areas map classifies Perry County, and the rest of Pennsylvania, as Humid Continental. While the state’s 67 counties share many weather similarities, there are also a few characteristics that are unique to certain regions. Perry County is labeled as part of the central region, which transitions between the more continental Appalachian Plateaus to the west and north and the relatively more marine southeast. The mountain and ridge-top regions have more extreme climates than the valley bottoms. On average, these mountaintop areas have much lower temperatures, more wind, and more total precipitation. TABLE 2.15 presents the weather summary for Perry County.

TABLE 2.15

PERRY COUNTY CLIMATE - AVERAGES AND RECORDS

Month	Average	Average	Mean	Average	Record	Record
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	High	Low	Temperature	Precipitation	High	Low
January	37°F	19°F	28°F	2.86 in.	74°F (1950)	-14°F (1968)
February	41°F	21°F	31°F	2.68 in.	77°F (1985)	-16°F (1961)
March	51°F	29°F	40°F	3.52 in.	88°F (1986)	1°F (1989)
April	63°F	38°F	51°F	3.20 in.	96°F (1976)	17°F (1982)
May	72°F	48°F	60°F	4.02 in.	96°F (1962)	29°F (1978)
June	80°F	57°F	69°F	4.00 in.	104°F (1952)	38°F (1972)
July	85°F	62°F	74°F	3.48 in.	106°F (1966)	45°F (1979)
August	82°F	61°F	71°F	3.35 in.	103°F (1955)	39°F (1949)
September	75°F	53°F	64°F	3.74 in.	103°F (1953)	29°F (1963)
October	64°F	41°F	52°F	3.26 in.	93°F (1962)	20°F (1969)
November	52°F	33°F	43°F	3.45 in.	84°F (1950)	10°F (1976)
December	41°F	24°F	33°F	3.20 in.	75°F (1984)	-16°F (1960)

SOURCE: www.weather.com

Weather patterns in Perry County have the potential to become a serious risk factor. The County’s weather extremes are a primary contributor to many natural hazard events, including flash flooding, winter storms, drought, severe temperatures, and high winds.

In addition to the devastating effects weather can have, it often can impede emergency response. Because of weather’s potential impact on mobility, the County may be most vulnerable to severe winter weather and flash flooding hazards. Regardless of the event, weather will always be a critical factor in disaster response, requiring emergency planning to account for all weather variations.

Transportation Infrastructure

Two major transportation routes run through the County, U.S. Routes 22/322 and U.S. Routes 11/15. Both of these routes lie in the eastern portion of the County and follow the Susquehanna River (U.S. Routes 11/15) and the Juniata River (U.S. Routes 22/322). Since the last MHMP, two traffic signals and a round-about have been installed along with several intelligent transportation system (ITS) messaging boards.

A total of 1,085.9 miles of functional roadway covers Perry County. Approximately 73.3 percent of the total miles are local roads. Only 3.9 percent of the miles (43.2 miles) are attributable to principal arterial roads. These principal arterial roads, U.S. Routes 22/322 and U.S. Routes 11/15, handle traffic volumes of 15,000 to 22,000 vehicles in annual average daily traffic.

In Perry County there are a total of 341 waterway obstructions considered bridges eligible for federal funding. Of these 277 are the Commonwealth's jurisdictional responsibility. There are 64 local bridges, with spans of 20 feet or greater qualifying them for federal funding. Nine are county-owned and the rest are municipal. There are several additional waterway crossings with spans less than those that are eligible for federal funding.

The Capital Area Transit Authority (CAT) currently does not provide any bus routes in Perry County. However, free CAT park-and-ride facilities are available to Perry County residents who commute into the Harrisburg area.

The Perry County Transportation Authority (PCTA) provides shared-ride paratransit service to the general public to and from all points throughout the County.

Geology

Perry County is located in the tightly folded and faulted ridge-and-valley region of Pennsylvania. This geologic region is characterized by large amounts of sandstone, shale, and limestone. Layers of the rock are generally in folds. Landforms in this region are most often parallel ridges and valleys eroded from the folded rock. The many ridges and valleys are how the region gets its name.

Geographic formations can restrict the nature and extent of surface development. They can also affect the quality and quantity of groundwater. Perry County primarily consists of Ordovician bedrock, which is made up of shale, limestone, dolomite, and sandstone-based geographic formations. Limestone formations are highly soluble and can create caverns and cause subsidence and sinkholes (also known as karst topography). Karst topography is sensitive to environmental degradation. The most severe form is the depletion and contamination of groundwater supplies.

Data Sources and Limitations

A significant portion of the information utilized in the updating of this plan was derived from the preceding plan adopted in 2008. PEMA's Hazard Mitigation Planning Checklist was used

to facilitate this plan update. TABLE 2.1 details the varying levels of municipal planning presently undertaken throughout the county. The Base Map (MAP 2.1) of the County was provided by the TCRPC on February 4, 2013. The map of Existing Land Use and Land Coverage (MAP 2.2) was provided by the TCRPC on February 4, 2013.

There are very few limitations surrounding the data provided with these first two maps (MAP 2.1 and MAP 2.2). In fact, much of the general planning information is current and has been compiled to address updates to the County Comprehensive Plan and this MHMP.

The Impervious Surface Coverage (MAP 2.3) was provided by the TCRPC on May 1, 2013. This data layer is a very basic attempt to derive impervious surface coverage from the existing land use and land coverage layer. While the layer sheds some light on where impervious surface would likely originate, it provides an overestimation of this coverage, as the layer also includes lands visibly used and connected to the use. For a true impervious layer, the layer would need to exclusively identify such features as roads and streets, sidewalks, most building rooftops, and parking lots. The level of detail with the data will need to be discussed for use in future plans.

While there have been substantial efforts made to improve GIS data for identification of hazards, data limitations still exist for some of the county's hazards.

CHAPTER 3

PLANNING PROCESS

Update Process and Participation Summary

Requirement § 201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

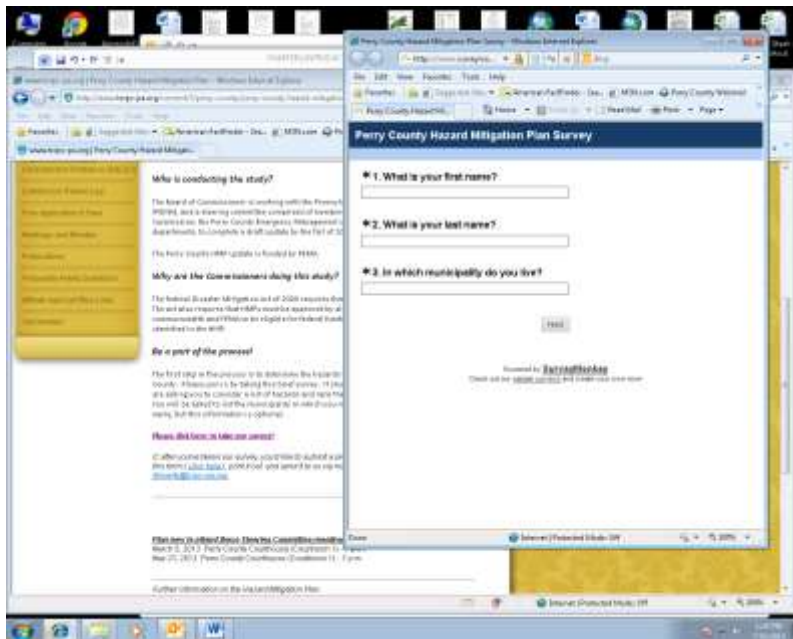
1. *An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
2. *An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private non-profit interests to be involved in the planning process; and*
3. *Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

Requirement § 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.¹

At the onset of the planning process, as early as May 22, 2018, enabled staff to prepare and customize the process to meet the needs of the participating municipalities, as well as the County. The process was developed considering FEMA’s and Local Mitigation Plan Review Tool.

Throughout the plan update process a survey was available for the public to input their thoughts from the TCRPC website. (See FIGURE 3.1) Newsletter articles were also used to share information as well as articles in the County’s three newspapers.

FIGURE 3.1



The MHMP update process involved a variety of key decision makers comprised as the Steering Committee and Core Committee, municipal officials as principal stakeholders and the general public as well.

Three Steering Committee meetings were held in the County Courthouse and advertised open to the public. Three public forums were also conducted in areas where municipal participation was needed. The website survey displayed on the left did not receive any public input despite its availability and

FIGURE 3.1: TCRPC Website

¹ Ibid.

information being made available to the press.

Staff provided the Perry County Planning Commission (PCPC) with updates on the progress of this plan update on a monthly basis. Appendix B contains a sample agenda from one of the PCPC meetings. In following, each of the three County Commissioners were individually provided verbal progress reports on the project during the PCPC's next day briefings.

When the draft MHMP was posted and available for public viewing on the TCRPC website, the surrounding counties, municipalities and school districts were all advised of its availability.

The integration of the plan into the comprehensive planning process has become a focal point of efforts to migrate away from having the plan stand-alone while other planning pursuits are being undertaken.

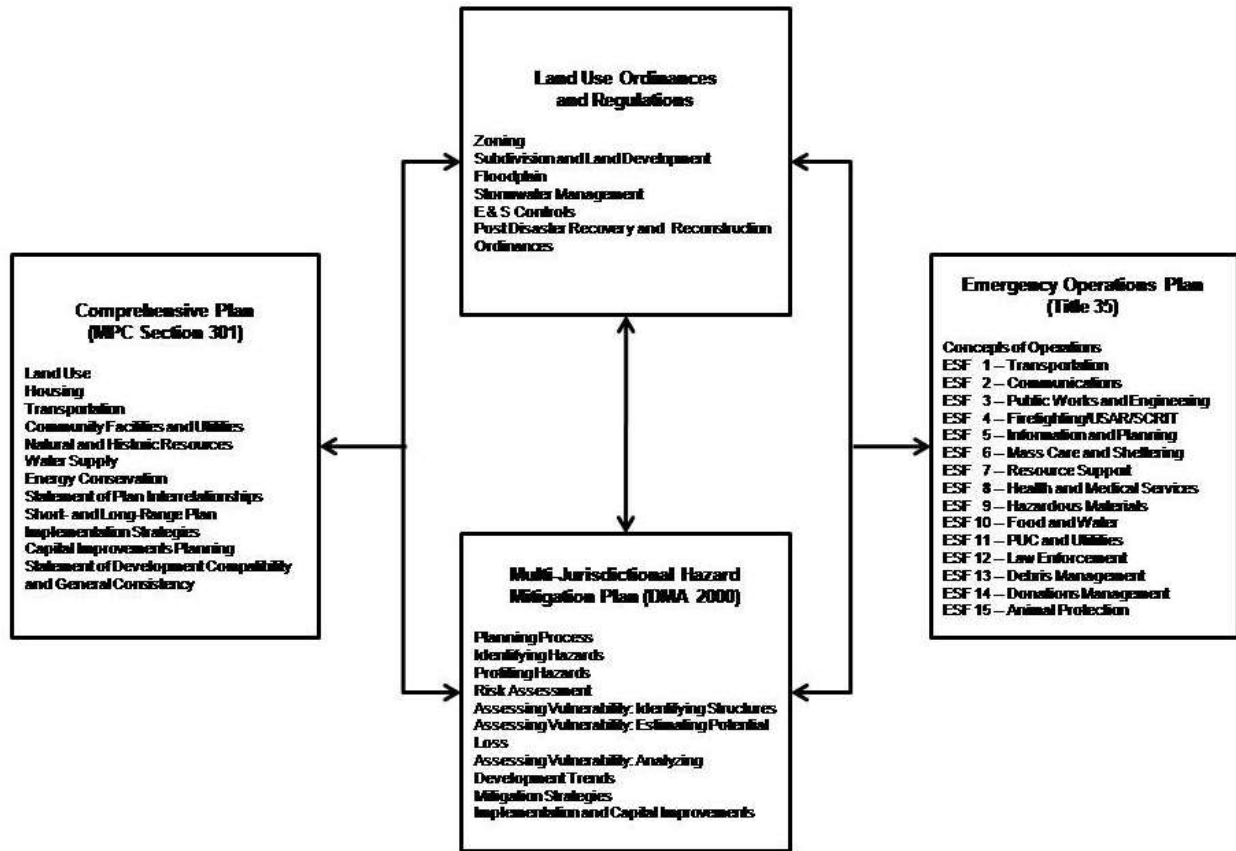
Plan Interrelationships

Figure 3.2 illustrates the interrelationships between the MHMP, County Comprehensive Plan, County EOP, and other community planning mechanisms. Maintaining consistency between these documents is critical. In fact, Section 301 of the PA MPC requires comprehensive plans provide a discussion of the interrelationships among their various plan components, "which may include an estimate of the environmental, energy conservation, fiscal, economic development, and social consequences on the environment."

When developing the MHMP, information from the County Comprehensive Plan, Emergency Operations Plan, and various land use ordinances and regulations were considered. Moving forward, each of these documents should not be treated as unrelated and updated separately. With the adoption of this MHMP, the County and each participating municipality will be responsible for incorporating the specific mitigation actions recommended in this plan into the necessary planning documents, including the appropriate comprehensive plan, emergency operations plan, and any land use regulations.

To that end, Perry County and its municipalities must ensure that the components of the MHMP are integrated into existing community planning mechanisms and are generally consistent with goals, policies, or recommended actions. Perry County and the Hazard Mitigation Planning Steering Committee will continue to utilize the existing maintenance schedule of the MHMP and incorporate the goals, policies, or recommended actions of the plan as it is updated.

FIGURE 3.2



Hazard Interrelationships

Hazards can occur alone, or they can be compounded to create higher order catastrophes. In some cases it is the initial hazard that spawns additional hazardous events. Sometimes this results in the secondary event being more severe than the first.

For example, a severe storm may have lightning which makes contact with the ground. The lightning strike from the storm may cause a wildfire. In both instances the hazards are of a natural variety.

The following would be an example of a human induced and perpetuated scenario. A vehicle trafficking narcotics through our county is in a high speed chase with authorities. The individual loses control of the vehicle on a corner and crashes into the side of a tractor trailer he or she was attempting to pass. The tractor trailer was carrying propane which ruptured and ignited.

Both natural and human induced or augmented hazards can interplay and prove to be equally harmful. As another example, a severe storm with lightning may cause power outages, which may adversely affect the health or well-being of homebound individuals with certain health conditions.

The following table (TABLE 3.1) displays the common connections between hazards and their relationships to perpetuate subsequent hazards. When the table was developed the following question was

posed. If the initial hazard occurs, what hazard has the likelihood to immediately follow, exacerbating events or simply effecting Perry County?

TABLE 3.1

PERRY COUNTY HAZARD CONNECTIONS

Principal/ Initiating Hazard	Strength of Connection																
Civil Disorder	X	x	x	o	X	o	x	o	x	o	o	o	X	o	o	o	NA
Dam Failure	o	x	o	o	o	o	X	o	x	o	o	X	o	o	o	NA	x
Drought	o	o	o	o	o	o	X	x	o	o	o	o	o	X	NA	o	o
Wildfire	o	x	x	o	o	o	X	o	o	o	o	o	o	NA	x	o	o
Urban Fire	o	X	o	o	o	o	X	o	x	o	o	o	NA	o	o	o	o
Flooding	o	X	X	o	o	o	X	x	x	o	o	NA	o	o	o	X	x
Forest Insects and Disease	o	x	x	o	o	o	o	o	o	o	NA	o	o	X	o	o	o
Geologic Hazards	o	X	X	o	o	o	o	x	o	NA	o	o	x	o	o	x	o
Hazardous Materials Spill	o	o	X	o	o	o	X	X	NA	o	o	o	x	x	o	o	o
Nuclear Incident	o	X	x	o	o	o	X	NA	X	o	o	o	o	o	o	o	X
Public Health Emergency	o	o	x	o	o	o	NA	o	o	o	o	o	o	o	o	o	X
Severe Weather	o	X	X	X	o	NA	X	x	X	o	o	X	x	X	X	X	o
Terrorism	o	X	X	o	NA	o	X	X	X	o	o	o	x	x	o	x	x
Tornado	o	X	x	NA	o	X	x	x	X	o	o	o	o	o	o	o	o
Transportation Accidents	o	X	NA	o	x	X	x	x	X	o	o	o	x	x	o	o	x
Utilities Failure	o	NA	X	o	o	o	X	X	X	o	o	o	o	o	o	o	o
Illegal Drug Activity	NA	o	X	o	x	o	X	o	o	o	o	o	o	o	o	o	X
	Illegal Drug Activity	Utilities Failure	Transportation Accidents	Tornado	Terrorism	Severe Weather	Public Health Emergency	Nuclear	Hazardous Materials Spill	Geologic Hazards	Forest Insects and Disease	Flooding	Urban Fire	Wildfire	Drought	Dam Failure	Civil Disorder
Secondary/ Subsequent Hazard																	

Key

- X - Strong Connection
- x - Minor Connection
- o - Little To No Connection
- NA - Not Applicable

From the previous table it is clear which hazards are predominantly initial hazards and which can be considered secondary. The principal category includes dam failure, drought, flooding, forest insects, geologic hazards, severe weather, terrorism, tornado, and illegal drug activity.

The secondary category includes urban fire, wildfire, hazardous materials spill, nuclear incident, public health emergency, transportation accidents, and utilities failure.

One noteworthy item is the strength of the connections transportation accidents has as it interrelates with all other hazards. Another point worth mentioning is the observed balance civil disorder displays when evaluated in this manner.

Ultimately the strength of these connections may weigh into the decision-making process when it comes to identifying projects. Moreover this could be a tremendous influence on what hazard mitigation efforts are undertaken locally.

The Planning Team

From the onset of the update process, the Perry County Board of Commissioners were proactive in the MHMP development process. The core project team consisted of a representative from the County Emergency Management Agency, the Commissioner’s Office, and the Planning Office to get the project up and running. The Steering Committee was restructured to fill some of the positions left vacant since the initial plan. TABLE 3.2 presents a list of the steering committee members for the county.

TABLE 3.2

MHMP STEERING COMMITTEE

County Commissioner - Steve Naylor	County Emergency Management Coordinator - Rich Fultz	Municipal Planner - John McElhiney
Municipal Official - Scott Weaver	Rabbit Transit - Rich Farr or Dave Cook	Municipal Zoning Officer - Bob Hart
Chamber of Commerce - Rich Pluta or Becky Kephart	LEPC Representative – Mike Minch	Economic Development Authority - Marti Roberts or Michelle Jones
PPL - George Hower, Field Manager for Operations, or Jessica Baker, Senior Engineer	Enbridge - Justin Rose	Sunoco – Christopher M. Brennan, Community Affairs Representative
Human Services Area Agency on Aging - Gregory Wirth	Join Hands - Michael J. Burns, Director	Duncannon EMS - Kraig Nace
Greenwood School District - Dr. Nicholas Guarente, Superintendent	Newport School District – Ryan Neuhard, Superintendent	Susquenita School District – Kent R. Smith, Superintendent
West Perry School District – Dr. Michael O’Brien	Public Transportation - Rohrer Bus Service	Perry County Food Bank - John Kiner or Linda Bates
Perry County Farm Bureau – Dave McLaughlin	June Reisinger – Agriculture and Economic Development	
Ad Hoc		
Perry County Planning	GIS Coordinator - Dave Unger	Information Technology (IT) -

Coordinator - Jason R. Finnerty	Dean Lusby
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There is a noticeable difference between the 2008 Plan and the 2013 document before you. The following Table (TABLE 3.3) provides the reader with some perspective as to the changes offered with this MHMP plan update.

TABLE 3.3
2008 TO 2019 MHMP FORMAT CHANGES

2008 MHMP	2014 MHMP	2019 MHMP
Executive Summary	Executive Summary	Executive Summary
Table of Contents	Table of Contents	Table of Contents
Section 1 - Overview	Chapter 1 - Introduction	Chapter 1 - Introduction
Section 2 - Hazard Vulnerability and Risk Assessment	Chapter 2 - Community Profile	Chapter 2 - Community Profile
Section 3 - Capability Assessment	Chapter 3 - Overall Goals Objectives and Strategies	Chapter 3 – Planning Process
Section 4 - Hazard Mitigation Strategies and Mitigation	Chapter 4 - Hazard Interrelationships	Chapter 4 – Risk Assessment
Section 5 - Plan Maintenance	Chapter 5 - Carryover Hazard Mitigation Measures	Chapter 5 – Capability Assessment
Section 6 - Authorities and References	Chapter 6 - All Hazard Mitigation Measures (Tables)	Chapter 6 – Mitigation Strategy
Section 7 – Glossary of Acronyms and Definitions	Chapter 7 - Plan Integration and Maintenance	Chapter 7 - Plan Integration and Maintenance
Appendices <ul style="list-style-type: none"> • Appendix A - Resolutions • Appendix B - Public Participation • Appendix C - Hazard Profiles • Appendix D - Hazard Mitigation Measures Tables • Appendix E - Opportunity Forms • Appendix F - Status Reports • Appendix G - Progress Report 	Chapter 8 - Resolutions Adopting the Plan	Chapter 8 – Adoption (Resolutions)
	Chapter 9 - Public Participation	Appendices <ul style="list-style-type: none"> • Appendix A - Bibliography • Appendix B - Local Mitigation Plan Review Tool • Appendix C - Meeting and Other Participation Documentation • Appendix D - Local Municipality Flood Vulnerability Maps • Appendix E - Critical Facilities • Appendix F - Hazus Results Report
	Chapter 10 - Hazard Profiles	
	Chapter 11 - Risk Assessment and Hazard Vulnerability Analysis	
	Chapter 12 - MHMP Mitigation Measures	
	Chapter 13 - Project Opportunity Forms	
	Chapter 14 - Project Progress Reports	

	Chapter 15 - Annual HMP Review Documentation	<ul style="list-style-type: none"> • Appendix G - Mitigation Action Prioritization • Appendix H - MHMP Mitigation Measures • Appendix I - NFIP Coverage • Appendix J - Project Progress Report (Annual MHMP Review) • Appendix K - Project Opportunity Form
	Chapter 16 - Other MHMP Associated Documentation	
	Chapter 17 - Capabilities Assessments	

Meetings and Documentation

TABLE 3.4 provides a list of the public outreach efforts undertaken during the MHMP planning process. Each meeting was advertised on our website, distributed to our email contact list and the venues were all public meetings open to all residents Perry County. Attendance for each meeting is documented in Appendix B while summary reports and meeting minutes can be found in Appendix C.

**TABLE 3.4
PUBLIC EDUCATION AND OUTREACH HISTORY**

Location	Event	Date	Time	Information Contained in this Appendix
Marysville Borough Municipal Building, 200 Overcrest Road, Marysville, PA	Marysville Borough Planning Commission Meeting	May 22, 2018	7:30 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA	Perry County Planning Commission Meeting	June 20, 2018	7:00 PM	Yes
Marysville Borough Municipal Building, 200 Overcrest Road, Marysville, PA	Marysville Borough Planning Commission Meeting	June 26, 2018	7:30 PM	Yes
Blain Borough Hall	Blain Borough Council Meeting	July 12, 2018	7:30 PM	Yes
Perry County Business and	Perry County Economic	July 12, 2018	8:00 PM	Yes

Tourism Center	Development Authority			
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA	Perry County Planning Commission Meeting	July 18, 2018	7:00 PM	Yes
Marysville Borough Municipal Building, 200 Overcrest Road, Marysville, PA	Marysville Borough Planning Commission Meeting	July 24, 2018	7:30 PM	Yes
TCRPC Office, 112 Market Street, 2 nd Floor, Harrisburg, PA	TCRPC (bi-monthly meeting)	July 26, 2018	3:30 PM	Yes
Spring Township Municipal Building	Spring Township Planning Commission Meeting	July 26, 2018	6:30 PM	Yes
PCPC webpage on the TCRPC’s website & Perry County Website entry page	Website survey posting	August 1, 2018	NA	Yes
Perry County Business and Tourism Center, 9 West Main Street, New Bloomfield, PA 17068	Perry County Economic Development Authority	August 9, 2018	8:00 AM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	August 15, 2018	7:00 PM	Yes
Marysville Borough Municipal Building, 200 Overcrest Road, Marysville, PA 17053	Marysville Borough Planning Commission Meeting	August 28, 2018	7:30 PM	Yes
Not Applicable - Email message to all 30 Perry County Municipalities	Survey notification and Project Opportunity Form distribution	August 29, 2018	11:54 AM	Yes
Perry County Business and Tourism Center, 9 West Main Street, New Bloomfield, PA 17068	Perry County Economic Development Authority	September 13, 2018	8:00 AM	Yes
Bloomfield Borough Office Building, Council Chambers, 25 East McClure Street, New Bloomfield, PA 17068	Perry County COG and Boroughs Association Meeting	September 13, 2018	7:00 PM	Yes

Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	September 19, 2018	7:00 PM	Yes
Marysville Borough Municipal Building, 200 Overcrest Road, Marysville, PA 17053	Marysville Borough Planning Commission Meeting	September 25, 2018	7:30 PM	Yes
Toboyne Township Municipal Building, 50 Lower Buck Ridge Road, Blain, PA 17006	Toboyne Township Board of Supervisor’s Meeting	September 28, 2018	7:00 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	October 17, 2018	7:00 PM	Yes
Perry County Courthouse, Court Room 1, 2 East Main Street, New Bloomfield, PA 17068	MHMP Steering Committee Meeting	October 18, 2018	7:00 PM	Yes
TCRPC Office, 112 Market Street, 2nd Floor, Harrisburg, PA	TCRPC Newsletter	November 3, 2018	NA	Yes
Perry County Business and Tourism Center, 9 West Main Street, New Bloomfield, PA 17068	Perry County Economic Development Authority	November 8, 2018	8:00 AM	Yes
Bloomfield Borough Office Building, Council Chambers, 25 East McClure Street, New Bloomfield, PA 17068	Perry County COG and Boroughs Association Meeting	November 8, 2018	7:00 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	November 21, 2018	7:00 PM	Yes
Perry County Business and Tourism Center, 9 West Main Street, New Bloomfield, PA 17068	Perry County Economic Development Authority	December 13, 2018	8:00 AM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	December 19, 2018	7:00 PM	Yes
Greenwood Township Municipal Building, 17 Pines Drive, Millerstown, PA 17062	Greenwood Township Planning Commission	January 2, 2019	6:30 PM	Yes

	Meeting			
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	MHMP Steering Committee Meeting	January 8, 2019	1:00 PM	Yes
Miller Township Municipal Building, 554 Old Limekiln Lane, Newport, PA 17074	Miller Township Planning Commission Meeting	January 9, 2019	7:00 PM	Yes
Perry County Business and Tourism Center, 9 West Main Street, New Bloomfield, PA 17068	Perry County Economic Development Authority	January 10, 2019	8:00 AM	Yes
Duncannon Borough Council Chambers, 428 High Street, Duncannon, PA 17020	Duncannon Borough Council Meeting	January 15, 2019	7:00 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	January 16, 2019	7:00 PM	Yes
TCRPC Office, 112 Market Street, 2nd Floor, Harrisburg, PA	TCRPC Newsletter	January 28, 2019	NA	Yes
Duncannon Borough Council Chambers, 428 High Street, Duncannon, PA 17020	Perry County Times Article	January 31, 2019	NA	Yes
Buffalo Township Municipal Building, 22 Cherry Road, Liverpool, PA 17045	Buffalo Township Board of Supervisors Meeting	February 4, 2019	7:00 PM	Yes
Centre Township Municipal Building, 2971 Cold Storage Road, New Bloomfield, PA 17068	Centre Township Board of Supervisors Meeting	February 5, 2019	7:00 PM	Yes
Greenwood Area Elementary School	Perry County Association of Township Officials 100 th Annual Convention	February 23, 2019	7:00 AM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	MHMP Steering Committee Meeting	March 5, 2019	1:00 PM	Yes
Penn Township Municipal Building, 100 Municipal Building Road, Duncannon, PA 17020	Southeastern Perry Regional Planning Area Open House	March 11, 2019	10:00 AM	Yes
Millerstown Borough Municipal Building, 44 North High Street,	Southeastern Perry Regional	March 13, 2019	10:00 AM	Yes

Millerstown, PA 17062	Planning Area Open House			
Blain Volunteer Fire Company, 4 West Main Street, Blain, PA 17006	Western Perry Regional Planning Area Open House	March 18, 2019	6:00 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Perry County Planning Commission Meeting	March 20, 2019	7:00 PM	Yes
Landisburg Volunteer Fire Department, 301 Faculty Avenue, Landisburg, PA 17040	Landisburg Borough Council Meeting	October 14, 2019	7:00 PM	Yes
Perry County Commissioner’s Conference Room, 20 West Main Street, New Bloomfield, PA 17068	Final Public Hearing	August 18, 2020	7:00 PM	Yes

Public and Stakeholder Participation

Everyone residing within, or undertaking business in Perry County has a stake in the County's future. This point is difficult to remind people when the hazard that may cause them harm has not either happened or reoccurred within their lifetime.

Newsletter articles have routinely been used to offer education to those who are actively on our newsletter mailing list. The number for this distribution currently stands at around 2,200 persons.

Surveys have been a pillar of content helping to shape this and the county's prior two plans. The use of two surveys with this plan helped with formulating content related to the hazards and their risks.

The county's first effort in holding public open house opportunities took place with this plan. The format seemed to work quite well allowing the county to interact with the general public on the plan.

When holding meetings on the subject of hazard mitigation attendance has traditionally not been great. As a bedroom community for the Harrisburg-York-Lebanon, PA Combined Statistical Area, as well as Carlisle, many people have a difficult time getting to meetings to discuss such topics.

Outreach was expand to involve the public in three open house sessions. In each of our neighboring counties lead planning officials, and emergency services personnel were invited to participate in our process through its entirety. With a few municipal holdouts for participation, impromptu visits to these municipalities were warranted in order to document their involvement in our plan update process.

All of the details of these interactions with the public and stakeholders can be found in Appendix C.

Multi-Jurisdictional Planning

Requirement §201.6(a)(3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process...Statewide plans will not be accepted as multi-jurisdictional plans.²

An open, public process was used in preparing the Perry County MHMP update. Meetings with municipal officials were conducted to inform and educate them about the plan update and its impact on local HMPs. In turn, municipal officials provided information related to existing codes and ordinances, the risks and impacts of known hazards on local infrastructure and critical facilities, and recommendations for related mitigation opportunities. A conscious effort was made to seek out municipalities and directly involve them in the process by attending several municipal meetings to attain 100% participation at some level of engagement. The culmination of this effort will more importantly be realized once the final count of municipal resolutions is tallied and whether we have improved our participation levels since 2008. From our experience with the 2008 Plan many of the Resolutions were slow to be returned. As these were received they were in each instance forwarded on to PEMA and FEMA for appropriate record keeping. The same will be undertaken with this plan with its conclusion.

² Ibid.

CHAPTER 4
RISK ASSESSMENT

Update Process Summary

A Hazard Vulnerability Analysis (HVA) evaluates risk associated with a specific hazard, defined by probability and frequency of occurrence, magnitude, severity, exposure, and consequences. The Perry County HVA provides in-depth knowledge of the hazards and vulnerabilities that affect Perry County and its municipalities. This document uses an all-hazards approach when evaluating the hazards that affect the County, and the associated risks and impacts each hazard presents.

There are five core elements to consider with the purpose of conducting this HVA. They are:

1. To develop a common awareness among emergency service agencies, public officials and the public of the major hazards existing in Perry County.
2. To identify the locations, the number of persons and the major facilities that may be vulnerable to each type of hazard.
3. To encourage cooperative management of emergency situations based on a common understanding of hazards and their impacts.
4. To enhance our emergency and disaster response and recovery capabilities for all hazards.
5. To encourage plans and actions for preventive measures and effective response to preserve life and property in areas vulnerable to effects of natural and man-made hazards.

This HVA provides the basic information necessary to develop effective hazard mitigation strategies. Moreover, this document provides the foundation for the Perry County Emergency Operations Plan (EOP), local EOPs, and other public and private emergency management plans.

The Perry County HVA is not a static document, but rather, requires a five-year review with periodic updates. Potential future hazards and impacts may result from changing technology, new facilities, infrastructure, and development patterns, as well as demographic and socioeconomic changes that occur within or outside the area. By contrast, old hazards, such as brownfields and landfills, may pose new threats as the County's development expands.

Using the best information available and Geographic Information Systems (GIS) technologies, the County can objectively analyze its hazards and vulnerabilities. Assessing past events is limited by the number of occurrences, scope, and changing circumstances. For example, ever-changing development patterns in Pennsylvania have a dynamic and far-reaching impact on traffic patterns, population density and distribution, stormwater runoff, and other related factors.

Hazard Identification

A comprehensive, all-hazards list of events that have occurred or could occur in Perry County was developed for this HVA. Appendix C in the current HMP provides a detailed profile of each

hazard listed below and describes and analyzes vulnerabilities and risks each hazard presents to Perry County.

The following hazards were considered:

- Building or Structure Collapse
- Civil Disorder, Disturbance, or Unrest
- Dam or Levee Failure
- Drug Overdose, the Opioid Crisis, and Illegal Drug Activity
- Hazardous Materials Release
- Mass Food or Animal Feed Contamination
- Nuclear
- Pipeline Incident
- Terrorism (Any Acts Including Agri- and Cyber)
- Transportation Accident
- Urban Fire and Explosion
- Utility Interruption
- Earthquake
- Landslides and Rock Fall
- Radon
- Land Subsidence and Sinkholes
- Drought
- Extreme Temperatures
- Flooding, Including Flash Floods and Ice Jams
- Hailstorm
- Hurricane, Tropical Storm and Nor'easter
- Invasive Species and Diseases
- Lightening
- Pandemic (Health Emergency)

- Winter Storm, Blizzard, or Ice Storm
- Tornado or Wind Storm
- Wildfire
- Animal Health Emergency

The top three hazards identified in Perry County are flooding, drought, and transportation incidents. While this vulnerability analysis of critical facilities focuses primarily on the top three hazards, the analysis further illustrates how other hazards may be inter-related, causing or being caused by other hazards. A detailed description of all hazards is found in Appendix C of the Perry County Hazard Mitigation Plan.

TABLE 4.1

COUNTY AND MUNICIPAL HAZARD VULNERABILITY SUMMARY

Hazard Category	Hazard																											
	Human-made												Natural															
	Technological												Geologic			Atmospheric												
Grouping	Technological												Geologic			Atmospheric												
Municipality	Building or Structure Collapse	Civil Disorder, Disturbance or Unrest	Dam or Levee Failure	Drug Overdose and Illegal Drug Activity	Hazardous Materials Release	Mass Food or Animal Feed Contamination	Nuclear	Pipeline Incident	Terrorism (Any Acts Including Cyber)	Transportation Accident	Urban Fire and Explosion	Utility Interruption	Earthquake	Landslides and Rock Fall	Radon	Land Subsidence (Sinkholes)	Drought	Extreme Temperatures	Flooding, including Flash Floods and Ice Jams	Hailstorm	Hurricane, Tropical Storm, Nor'easter	Invasive Species and Diseases	Lightning	Pandemic (Health Emergency)	Winter Storm, Blizzard or Ice Storm	Tornado or Wind Storm	Wildfire	Animal Health Emergency
Perry County	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Blain Borough	x	x	x	x		x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Bloomfield Borough	x	x		x		x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Buffalo Township	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Carroll Township	x	x		x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Centre Township	x	x		x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Duncannon Borough	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Greenwood Township	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Howe Township	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Jackson Township	x	x	x	x		x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Juniata Township	x	x		x		x	x		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Landisburg Borough	x	x		x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Liverpool Borough	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Liverpool Township	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Marysville Borough	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Miller Township	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Millerstown Borough	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
New Buffalo Borough	x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Newport Borough	x	x		x		x	x		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Northeast Madison Township	x	x	x	x		x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Oliver Township	x	x		x		x	x		x			x	x	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	x	x	x	x	x	x	x	x	x	x	x	x	x	x

	Flooding Associated with Tropical Depression Frances		
DR-1538	Pennsylvania Severe Storms and Flooding	-	August 06, 2004
DR-1497	Pennsylvania Tropical Storms Henri and Isabel, and Related Severe Storms and Flooding	-	September 26, 2003
DR-1485	Pennsylvania Severe Storms, Tornadoes, and Flooding	-	August 23, 2003
EM-3180	Pennsylvania Snowstorm	March 14, 2003	-
-	Drought & Water Shortage	February, 2002 (Governor)	-
DR-1383	Pennsylvania Tropical Storm Allison	-	June 21, 2001
DR-1298	Pennsylvania Tropical Depression Dennis and Flash Flooding	-	September 22, 1999
DR-1294	Pennsylvania Hurricane Floyd	-	September 18, 1999
DR-1289	Pennsylvania Severe Storms and Flooding	-	September 01, 1999
-	Drought	July, 1999 (Governor)	-
DR-1138	Pennsylvania Hurricane Fran	-	September 13, 1996
DR-1093	Pennsylvania Flooding	-	January 21, 1996
DR-1085	Pennsylvania Blizzard (Blizzard of 96)	-	January 13, 1996
DR-1015	Pennsylvania Winter Storm, Severe Storm	-	March 10, 1994

EM-3105	Pennsylvania Severe Snowfall and Winter Storm	March 16, 1993	-
-	Drought	July, 1991 (Governor)	-
-	Nuclear Facility Incident (TMI)	March, 1979 (none)	-
-	Blizzard	February, 1978 (Governor)	-
-	Heavy Snow	January, 1978 (Governor)	-
DR-523	Pennsylvania Severe Storms, Flooding	-	October 20, 1976
DR-485	Pennsylvania Severe Storms, Heavy Rains, Flooding (Eloise)	-	September 26, 1975
-	Truckers Strike	February, 1974 (Governor)	-
DR-340	Pennsylvania Tropical Storm Agnes	-	June 23, 1972
-	Heavy Snow	February, 1972 (Governor)	-
-	Heavy Snow	January, 1966 (Governor)	-
-	Ice Jam	March, 1963 (Governor)	-
DR-89	Pennsylvania Floods	-	January 23, 1959
DR-61	Pennsylvania Storm	-	August 09, 1956
DR-58	Pennsylvania Storm	-	May 21, 1956
DR-51	Pennsylvania Flood	-	March 15, 1956
DR-40	Pennsylvania Floods, Rains	-	August 20, 1955

Source: *Pennsylvania Emergency Management Agency*

Note: *The Robert T. Stafford Act of 1988 significantly refined the criteria for reporting, tracking, and declaring disaster emergencies*

Hazard Profiles

Building or Structure Collapse

Location and Extent

While there have been very few documented structure collapses, most would likely be attributed to poor maintenance, aging of structural materials, insect caused or damage from an event initiating hazard without responsive repair. This hazard can occur countywide; in our town centers with older housing, and in rural farming areas with barns and outbuildings. Vacated unmaintained buildings and structures are most susceptible.

Past Occurrence

In 2005, an overweight dump truck carrying stone collapsed a bridge in Penn Township on Dellville Road. Collapse can also occur as a result of the influence of other hazards. Perry County citizens know firsthand what can happen when fire is introduced to our county's heritage. The Dellville Bridge was nearly destroyed to the point of collapse. The pride of Perry County shown through this dark period of history to see the structure restored.



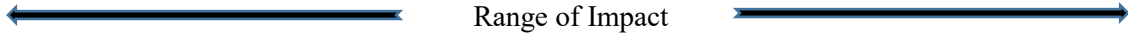
Dellville Bridge before arson fire

Source: TCRPC

Range of Magnitude

With buildings the magnitude of a building or structure collapse might look something along the following lines.

TABLE 4.3
MAGNITUDE OF BUILDING OR STRUCTURE COLLAPSE

 Range of Impact				
Low	Low-Medium	Medium	Medium-High	High
Shed or Pole Building	Cabin or Cottage	Houses	Apartment Buildings, Churches and places of congregation, Businesses, Historic Homes	Schools or Government Offices, Historic Businesses

It is a different story for bridges where the magnitude of an event might factor in the following: how critical a connection is made by the bridge; the circumstances by which the structure collapsed; and at times, its historic significance.



Reconstruction work commencing on the Dellville Bridge following the arson fire

Source: TCRPC

Future Occurrence

With statewide building codes in place administered by one centralized office, it is highly unlikely new construction for homes and businesses would fall victim to collapse unless building materials used in the construction process are flawed. Structures to be concerned about are unoccupied buildings pre-dating such codes with no attention paid to maintenance.

Bridges are routinely checked for structural integrity as part of a regimented bridge inspection program at all levels of government. As a result, they are systematically scheduled for maintenance, repair and or replacement based upon engineering recommendations from these inspections in order to mitigate the effects of time and elemental weathering of materials. Bridge closure always remains an option if a situation with a bridge becomes dire.

The greatest cause for concern for building collapse centers on older flood-prone structures. Flood damaged structures may fall into disrepair if property owners are faced with major repairs

and high flood insurance costs. Such derelict structures if left to the elements without maintenance could lead to building collapses.

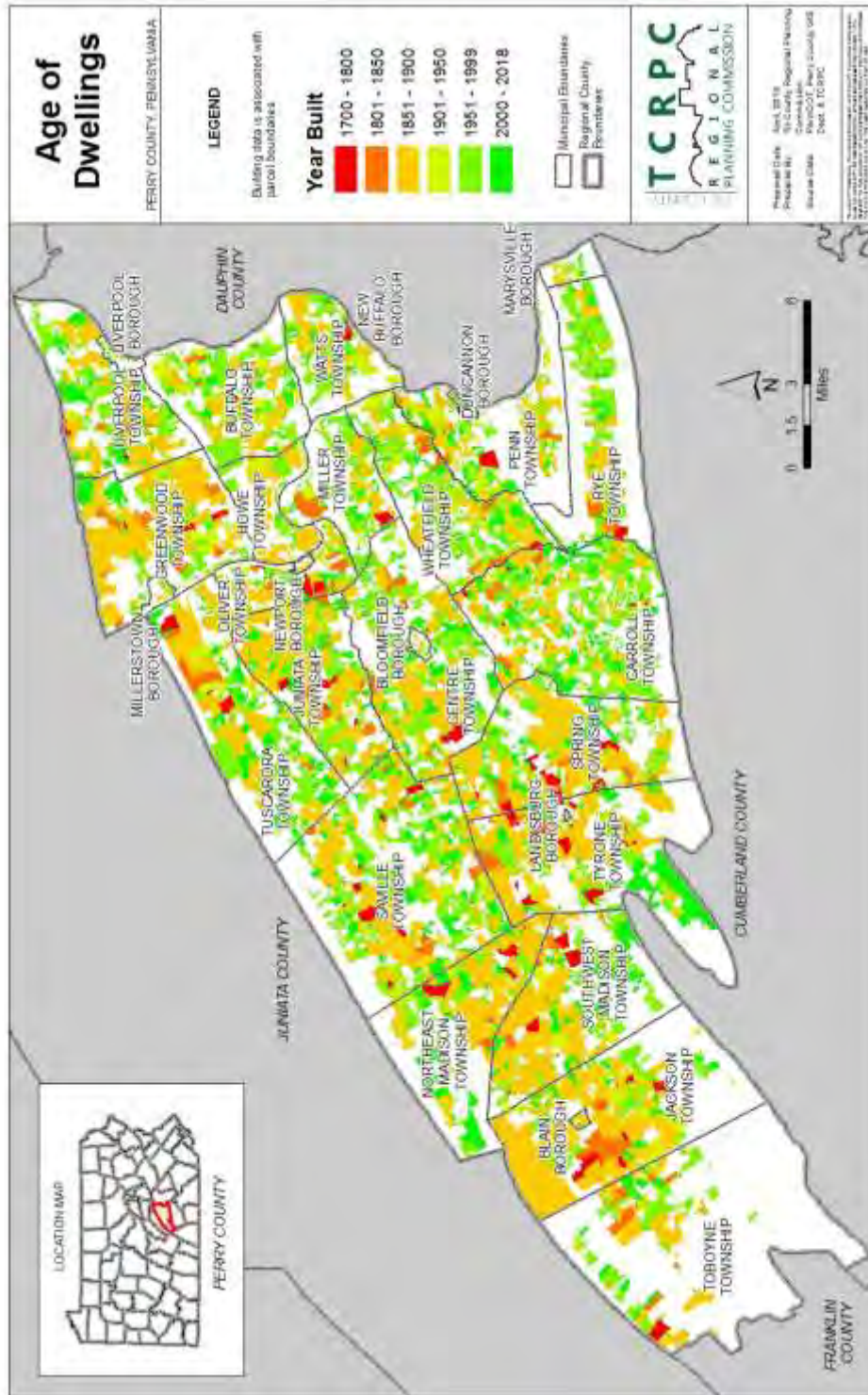
Pole buildings under 1,000 square feet without electricity are exempt from needing building permits. As such, these types of structures could be more susceptible to collapse as they age and time passes by.

Vulnerability Assessment

Considering bridges, the county's covered bridges are perhaps the most susceptible. While weight limits are posted to alert motorists, there are those that do not think of the harm they can bring to these historic structures.

Considering dwelling units and the safety of homeowners the average age of dwellings within the county is very diverse, with some historically recognized structures dating back to the 1700's. Map 4.1 on the next page, provides a thematic map displaying parcels color coded to an associated category of years to provide a visual rendition of the dispersal of property associated with housing age.

MAP 4.1



Probability

With the building code requirements of this day and age, the concerns for building collapse seem rather remote. However, potential lapses in enforcement of blighted and abandoned structures may lead to circumstances which result in the spreading of blight, further reducing the neighboring property values.

Maximum Threat

The maximum threat for building collapse might occur following a catastrophic flooding event where property owners cannot afford to repair their damage.

Secondary Effect

With building collapses there could be loss of home, business, value, and/or life. Depending upon its recognized value, the loss of a historic structure could have a ripple effect through the local community from the loss of such identifying and recognized features.

With structural collapses bridges could create immediate problems for the transportation network. Lengthy detours could impact government and the costs for providing services, businesses with delivery of goods and the ease of customer access, community facilities and utilities if they utilize the structure for routing, and the general public.



Source of Images: TCRPC

Civil Disorder, Disturbance, or Unrest

Location and Extent

Civil disorder is a term that generally refers to groups of people purposely choosing not to observe a law, regulation, or rule, usually to bring attention to their cause, concern, or agenda. It may also be defined as acts of violence by assemblages of three or more persons, which cause an immediate danger, or result in damage or injury to the property or person of any other individual.

Civil disorders can take the form of small gatherings or large groups blocking or impeding access to a building, or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot, in which a mob burns or otherwise destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. Generally, there are two types of large gatherings typically associated with disorders: a crowd and a mob.

A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four categories:

- **Casual Crowd** – A casual crowd is merely a group of people who happen to be in the same place at the same time. The likelihood of violent conduct is non-existent.
- **Cohesive Crowd** – A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshipping, dancing, or watching a sporting event. Although they may have intense internal discipline, they require substantial provocation to arouse to action.
- **Expressive Crowd** – An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest something.
- **Aggressive Crowd** – An aggressive crowd is comprised of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They tend to be impulsive and highly emotional, and require only minimal stimulation to arouse them to violence. Examples of this type of crowd include demonstrators and strikers.

A mob can be defined as a large disorderly crowd or throng. Mobs are usually emotional, loud, tumultuous, violent, and lawless. Similar to crowds, mobs have different levels of commitment and can be classified into four categories:

- **Aggressive Mob** – An aggressive mob is one that attacks, riots, and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.
- **Escape Mob** – An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs have lost their capacity to reason and are generally impossible to control. They are characterized by unreasonable terror.
- **Acquisitive Mob** – An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property. Examples of acquisitive mobs would include the looting in south central Los Angeles in 1992.
- **Expressive Mob** – An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent up emotions in highly charged situations. Examples of this type of mob include the June 1994 riots in Canada following the Stanley Cup professional hockey championship, European soccer riots, and those occurring after other sporting event in many countries, including the United States.

Although members of mobs have differing levels of commitment, as a group they are far more committed than members of a crowd. As such, a “mob mentality” sets in, which creates a cohesiveness and sense of purpose that is lacking in crowds¹.

Throughout the history of Perry County and the Commonwealth, riots have occurred infrequently. However, as seen in other parts of the country, riots can cause significant property damage, injury, and loss of life. Civil disorders vary widely in size and scope, and their impact is generally low.

Past Occurrence

Major civil disorders and riots have had a minimal impact on Perry County. The County has not experienced any major incidences of riots. Small events occur more frequently; however larger events, such as ones similar to the 1964 riot in Philadelphia or the 1989 prison riot in Camp Hill, are not common.

As recently as November 3, 2014, arguably one of Perry County’s most treasured historic and defenseless structures was attacked by one or more lowly arsonist cowards. Through the early morning hours of that day, the Dellville Covered Bridge was burned to its skeletal frame.

¹ Missouri State Emergency Management Agency, *Missouri State Hazard Mitigation Plan* (2004)

Range of Magnitude

The 2018 Pennsylvania Hazard Mitigation Plan lists four categories of crowds and four categories of mobs. From this information we can attempt to assemble a structural means of displaying the intensity of these assembling groups. Table 4.4 and Table 4.5 comprise this effort. For crowds the State’s plan provides the following definitions:

Casual Crowd: A casual crowd is merely a group of people who happen to be in the same place at the same time. Violent conduct does not occur.


Cohesive Crowd: A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshipping, dancing, or watching a sporting event. Although they may have intense internal discipline, they require substantial provocation to arouse to action.

Expressive Crowd: An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest.

Aggressive Crowd: An aggressive crowd is comprised of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They may be more impulsive and emotional, and require only minimal stimulation to arouse violence. Examples of this type of crowd could include demonstrators and strikers, though not all demonstrators and strikers are aggressive.

TABLE 4.4

VARIETY AND RANGE OF CROWDS

			
Low	Low-Medium	Medium-High	High
Casual Crowd	Cohesive Crowd	Expressive Crowd	Aggressive Crowd

Focusing on mobs, the State’s plan provides the following definitions.

Aggressive Mob: An aggressive mob is one that attacks, riots and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.


Escape Mob: An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs are generally difficult to control can be characterized by unreasonable terror.

Acquisitive Mob: An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property.

Expressive Mob: An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent up emotions in highly charged situations.

TABLE 4.5

VARIETY AND RANGE OF MOBS

 Forms By Intensity			
Low	Low-Medium	Medium-High	High
Expressive Mob	Escape Mob	Acquisitive Mob	Aggressive Mob

Future Occurrence

The potential for such civil disorder seems rather low although the potential for expressive crowds will always remain should something cause sufficient frustration to galvanize discourse.

Vulnerability Assessment

Minor civil disobedience and public disorder is something that may occur, but with minimal impact. These events may be sparked for various reasons and the seriousness of the event may well be exacerbated by how authorities handle the crowd.

While civil disorder throughout Perry County remains a possibility, it is more likely this would be experienced in the form of a prison riot. The Federal Bureau of Prisons maintains three federal correctional institutions, one federal correctional complex, one federal detention center, and two U.S. penitentiaries in the Commonwealth of Pennsylvania. However, none is located in Perry County.² The nearest is the high security United States Penitentiary in Lewisburg, PA, less than 50 miles away. The United States Penitentiary (USP) is a high security facility housing male inmates. An adjacent satellite prison camp houses minimum security male offenders.

The Pennsylvania Department of Corrections maintains 26 state correctional institutions, 14 community corrections centers, more than 45 private community corrections facilities, and one motivational boot camp, housing almost 43,000 inmates statewide. No State Correctional

² Federal Bureau of Prisons. <http://www.bop.gov/>

Institutions (SCI) are located in Perry County. The closest State Correctional Institutions are located in Huntingdon County, approximately 75 miles away, and Cumberland County, approximately 30 miles away. The Perry County prison is located in Bloomfield Borough.

Living conditions are among the leading factors that contribute to prison riots. Overcrowding particularly exacerbates this problem. While the Perry County Prison population averages below the maximum capacity for the facility, the prison has recently experienced some “extraordinary occurrences.” “Extraordinary occurrences” are defined by the Pennsylvania Department of Corrections in 24 categories, including riot and destructive behavior, and are reported annually for each prison. In 2004, the Perry County Prison experienced four instances of “extraordinary occurrences.” In 2005, the prison experienced zero “extraordinary occurrences.” As of July 2006, the prison had experienced two “extraordinary occurrences.”

Probability

The probability of small-scale or widespread civil disorder occurring in Perry County is relatively low, with the likelihood of a significant event occurring approximately every 30 years or less. Small incidents at correctional facilities may occur more frequently, but are not expected to grow into a larger situation that affects the entire County.

Maximum Threat

The maximum threat of a civil disorder occurring in Perry County is at the Perry County Prison in Bloomfield Borough. With the capacity for 137 short-term inmates, the potential is present for unrest among the prison population to escalate into disorder. Should a disorder occur there, it likely will be limited to moderate disruption to the immediate surrounding area, but the event most likely would be contained within the confines of the facility. Although less likely, other types of civil disorders, such as youth vandalism, hostile demonstrations, or events held by extremist organizations, could take place. These events would most likely be focused around New Bloomfield, the County seat.

Secondary Effect

Local government operations and the delivery of services in the community may experience short-term disruptions. Environmental impact is likely to be limited, unless acts of sabotage are committed. The greatest secondary effect is the impact on the economic and financial conditions of the affected community, particularly in relation to the property, facilities, and infrastructure damaged from vandalism. More serious acts of vandalism may result in limited power failure or hazardous material spills, leading to a possible public health emergency. Altered traffic patterns may increase the probability of a transportation accident.

Dam or Levee Failure

Location and Extent

A dam is defined as an artificial barrier with the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water. A dam failure is a catastrophic type of failure, characterized by the sudden, rapid, and uncontrolled release of impounded water or the likelihood of such an uncontrolled release. It is recognized that there are lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters that adversely affects a dam's primary function of impounding water is properly considered a failure. These lesser degrees of failure can progressively lead to or heighten the risk of a catastrophic failure. Dam failures are usually a secondary effect of massive rainfall and flooding, and occur when too much water enters the spillway system. This will occur with little or no warning. Spring thaws, severe thunderstorms, and heavy rainfall are also contributory factors. Additionally, poor engineering or poor maintenance may also cause dam failures. According to the Federal Emergency Management Agency, dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam;
- Deliberate acts of sabotage;
- Structural failure of materials used in dam construction;
- Movement and/or failure of the foundation supporting the dam;
- Settlement and cracking of concrete or embankment dams;
- Piping and internal erosion of soil in embankment dams; and
- Inadequate maintenance and upkeep.

The Pennsylvania Department of Environmental Protection and the U.S. Army Corps of Engineers award permits for dams and share inspection responsibilities. Inspection results are characterized as either safe or unsafe. Dams are evaluated on categories, such as slope instability, excessive seepage, and inadequate spillways.

The National Inventory of Dams is a registry that captures information about structures that are greater than or equal to 25 feet in height or impounding 50-acre-feet or more of water (an acre-foot is equal to 325,851 gallons of water), and also includes structures above six feet in height, where failure would potentially cause damage downstream. The dams are classified in terms of hazard potential as "high," "significant," or "low," with high-hazard dams requiring Emergency Action Plans (EAP). There are seven dams in Perry County that are registered with the U.S. Army Corps of Engineers in the National Inventory of Dams. Of these, four are listed as high-hazard dams, requiring an EAP. According to the National Inventory of Dams, all four of these Perry County dams have a completed EAP. (See [Table 4.6](#))

TABLE 4.6
PERRY COUNTY DAM INVENTORY

Dam Name	River	Owner Name	Year Completed	Drainage Area (sq. miles)	Hazard
Upper	Upper	PA Game Commission	1919	6.5	Low
Little Buffalo Creek	Little Buffalo Creek	PA DCNR - Bureau of State Parks	1970	13.4	High
Hart	Laurel Run	Thomas G. Close	1978	Not Calculated	High
Lake Kimberly	Tributary to the Sherman Creek	Robert Klaus	1970	0.18	Low
Lake Heron (Markunas)	Tributary to the Susquehanna River	S. Dean and Gail K. Stevens	1970	0.4	High
Newport Plaza Dam	Tributary to the Juniata River	Caldwell Development Company	Not Listed	0.28	High
Cold Storage Dam	Tributary to the Little Buffalo Creek	Daniel T. Paul	Not Listed	0.96	Significant

Past Occurrence

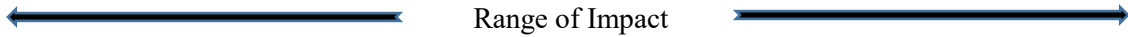
The National Performance of Dams Program, which maintains a database of failures for all dams listed in the National Inventory of Dams, lists no occurrences of dam failure or major incidents occurring at any of the seven dams in Perry County. While dam failures are mostly minor and cause little damage, Pennsylvania has experienced severe dam failures. The National Performance of Dams Program lists 19 dam failures in Pennsylvania since 1800. The worst dam failure experienced in the Commonwealth was in Johnstown in 1889. The resulting flood claimed 2,209 lives and resulted in an estimated \$3.5 million in damage.

Range of Magnitude

The text content for dams contained in the State's Plan could not be readily accessed so the county assembled its own version for conceptualizing potential impacts during a high water event. The following table (Table 4.7) shares what we were able to assemble.

TABLE 4.7

RANGE OF POTENTIAL OUTCOMES FOR DAMS AT OR EXCEEDING CAPACITY

					
Very Low	Low	Low-Medium	Medium-High	High	Severe
Use of Designed Spillway	Overtopping	Overtopping with Erosion	Overtopping with Undermining	Breach	Failure

The following table identifies three categories of potential concern with a dam failure. They are low high and Significant. Perry County’s dams fit into all three categories. The following table (Table 4.8) pairs each county dam up with one of these categories.

TABLE 4.8

HAZARD RANGE ASSOCIATED WITH DAMS

Low	High	Significant
Upper		
Lake Kimberly		
	Little Buffalo Creek	
	Hart	
	Lake Heron (Markunas)	
	Newport Plaza Dam	
		Cold Storage Dam

Future Occurrence

Long lasting weather events with precipitation will always contribute to concerns about dams and their ability to endure such infrequent tests. Changes to climate might just bring about

regional changes, particularly increased frequency of such events to go along with the studied intensity shifts.

Vulnerability Assessment

There is always the possibility any dam could fail, however, the probability is low. According to the Pennsylvania Emergency Management Agency (PEMA), minor dam failures occur every year, but their impact is minimal. Usually, they are gradual, low-volume releases that are unexpected and do not cause loss of life or damage to the environment. Perry County has both high-hazard and low-hazard dams within the County.

Dams assigned the significant-hazard potential classification are those where failure or mismanagement results in no probable loss of human life, but can cause economic loss, environmental damage, or disruption of lifeline facilities, or can impact other concerns. Significant-hazard potential classification dams are often located in predominantly rural or agricultural areas, but could be located in areas with population and significant infrastructure. Dams assigned the high-hazard potential classification are those where failure or mismanagement will probably cause loss of human life. Map 4.2 below shows the location of dams around Perry County.

Probability

The probability of a significant dam failure in Perry County is relatively low. Minor breaches can occur annually, but have little to no impact. Failures are less likely provided routine inspections are undertaken and appropriate maintenance and repairs are conducted when needed. Dam failures are most often a secondary effect of another hazard, such as severe weather, flooding, hurricanes, and tropical storms.

Maximum Threat

Perry County is home to seven dams recorded with the National Inventory of Dams. Only one of these dams is a high-hazard dam and has the required EAP. Three other significant-hazard dams are located in Perry County, two of which have an EAP completed. The greatest threat of a dam failure in Perry County would occur at one of these four dams.

Secondary Effects

Flooding is the most common secondary effect of dam failure. If the dam failure is severe, a large amount of water will enter riverbeds and overflow the stream banks for miles. There may be significant environmental effects, as the resulting flood from a dam failure is likely to disperse debris and hazardous materials downstream that can damage local ecosystems. Debris carried downstream can block roads, and cause traffic accidents, disrupt traffic patterns, and delay the delivery of essential services along major traffic corridors. Debris flow can also cause landslides along steep slopes and embankments. The economic and financial impact from damage and recovery can range from minimal to severe, depending on the magnitude of damage and scale of failure.

Drug Overdose, the Opioid Crisis, and Illegal Drug Activity

Location and Extent

Legal drugs are drugs that an individual is allowed to have. This classification of course depends on the jurisdiction in which the individual is located in. If an individual purchases legal or over the counter drugs, they will not be punished by a governing body or law enforcement agency.

Additionally, an illegal drug can carry legal use, typically for a medicinal application. Heroin or Morphine for example, is an effective painkiller, but in a generic setting, these drugs are deemed illegal and highly dangerous. By contrast, illegal drugs are substances, which an individual, by law, is not allowed to possess, use or distribute. The penalties attached to such use as associated with illegal drugs are dependent on the type of drug, the location in which the individual was arrested or detained, the quantity of the drug and the presence of prior arrests for a similar offense. Illegal drugs are often addictive and deadly in nature. Illegal drugs are often damaging to an individual's mental state and physical healthy.

The classification of which drugs are considered legal or illegal will vary from country to country. Furthermore, the punishments tied-into possession, use and the intent to distribute such drugs will also vary based on location. For instance, being found with a certain illegal drug may be legal (subject to fine) in one location, but it may carry grave felonious charges in another.

One of the major physical and psychological effects of drug abuse is addiction. Physical addiction is when the body has grown so used to the presence of a certain drug in its system that when that drug isn't present the body begins to react in painful, unpleasant ways. Psychological addiction, which is sometimes called a person's "habit," is when a person still desires the drug for purely psychological reasons. The user might find the drug comforting, or might believe that he needs it for some reason.

Psychological dependence involves a preoccupation with the drug's effects, and it usually results in lifestyle changes built around having and using that drug.

The emotional, psychological and social effects of drug use are even more prevalent in teens who use drugs, according to teendrugabuse.us. Teens are more emotionally, socially and psychologically fragile than older people, and drugs can impact their changing body chemistries more. Additionally, teens may use drugs as an emotional crutch, switching feelings of depression or loneliness for the numbness of a drug high. The more often they do this, the more the teens (or even older people, for that matter) may go to drugs to help them deal with negative emotions they don't feel they can face.

Below is a list of common illegal or misused drugs.

Amphetamines (and methamphetamines)

Amphetamines and methamphetamines are stimulants commonly abused by young people at parties or raves. These types of illegal drugs enhance the user's energy levels, allowing the individual to stay up all night. Aside from recreational use, these forms of stimulants can be used

to medicate individuals stricken with attention-deficit disorder. Methamphetamine is a highly addictive stimulant with effects similar to cocaine. Use of it can cause physical and psychological problems, such as rapid or irregular heart rate, increased blood pressure, anxiety and insomnia.

Cocaine & Crack Cocaine

When in powder form, cocaine is snorted or ingested by the user. Cocaine is a stimulant that leaves the user feeling more alert, talkative, strong and confident. Cocaine is extremely addictive and is a popular street drug. In a crystallized form, Cocaine is referred to as Crack; when solidified, the Cocaine is smoked by the user. Highs from crack are typically very short and powerful in nature.

Crack cocaine is cheaper than the powdered form and highly addictive. Cocaine is a powerfully addictive stimulant that directly affects the brain. Users may develop tolerance and need more and more of the drug to feel the same effects. Cocaine use can cause a variety of physical problems, including chest pain, strokes, seizures and abnormal heart rhythm. Because Crack is smoked, the user experiences a very quick, intense, but short-term high. Smoking large quantities of crack can cause acute problems, including cough, shortness of breath, and severe chest pains.

Ecstasy

Also referred to as MDMA, has both stimulant and hallucinogenic effects. Ecstasy is a partial derivative of amphetamine and possesses effects similar to other drugs within the classification.

Users of Ecstasy will feel a heightened sense of euphoria and an increased feeling of emotion, as well as sensitivity.

Hallucinogens

Also referred to as psychedelic drugs, hallucinogens create a range of perceptual distortion and various psychological symptoms. When a user is under the influence of these drugs, mushrooms, LSD or peyote for example, the individual will observe vibrant colors, transforming shapes and enhanced visions.

Some of the illicit substances that fit this category are:

- LSD
- Psilocybin
- DMT
- 2C-B
- DOB
- Ayahuasca
- Peyote
- Peruvian Torch
- San Pedro Cactus

Heroin

This type of opiate is extremely addictive, relatively cheap and popular in urban environments.

Heroin is fast acting and poses a number of deadly health risks. Because street heroine may contain a number of impurities, the drug can obstruct blood vessels that are crucial for the brain, liver, lungs and kidneys. Heroin may be taken via a pill form, snorted or smoked, or injected straight into the veins.

The recent epidemic that has befallen Pennsylvania the nation as a whole has prompted greater awareness at the state level to identify opioid abuse as a hazard in the state plan.

Marijuana

This popular drug comes from the leaves of the cannabis plant. Marijuana is smoked through a variety of instruments, such as a pipe, joint or bong. The typical effects of marijuana leave the user feeling relaxed and talkative. These effects typically plateau for roughly 90 minutes then taper off.

PCP

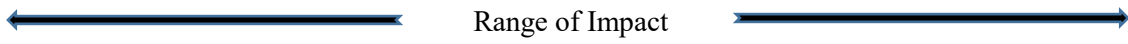
A synthetic drug, that comes in a white powder. PCP is easily dissolved in water or alcohol and is typically ingested via pill form. Users of PCP will experience severe distortions and heightened senses as well as vibrant illusions or images.

Prescription Opioids

The over prescription of opioid pain relief medication has led to a human crisis in the Commonwealth. So much so, Pennsylvania has identified the problem as an independent hazard in the State’s HMP. This far reaching issue has not avoided impacting Perry County. Naloxone injections have helped to save many lives, although the addictions are in some cases so severe that Naloxone has been used repetitively to save the same individuals on multiple occasions.

Range of Magnitude

TABLE 4.9
RANGE OF DRUG USE

				
Low	Medium	High	Extremely High	Severe

Prescribed (Followed Prescription)	Recreational Use	Addiction	Epidemic	Health Emergency
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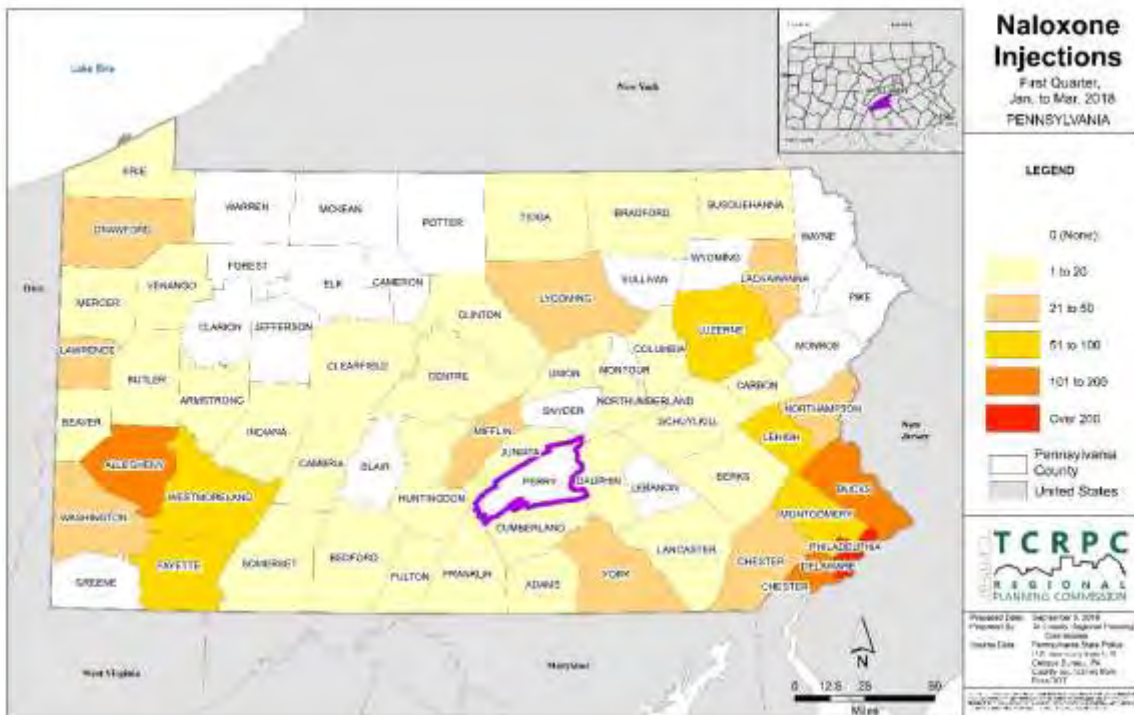
TABLE 4.10

RANGE OF POTENTIAL OUTCOMES FOR INDIVIDUALS OVERDOSING

Medium	Medium-high	High	Severe
Overdose Individual Rebounded Without Assistance	Overdose Requiring Resuscitation	Overdose Proving Fatal	Overdose Proving Fatal To Multiple Individuals

Past Occurrences

MAP 4.3.



Rohypnol

This type of illegal drug is a tranquilizer similar to Valium or painkillers but approximately 10 times more potent. This classification of drugs is extremely addictive; Rohypnol is commonly abused either for its intoxicating, sedative or numbing characteristics.

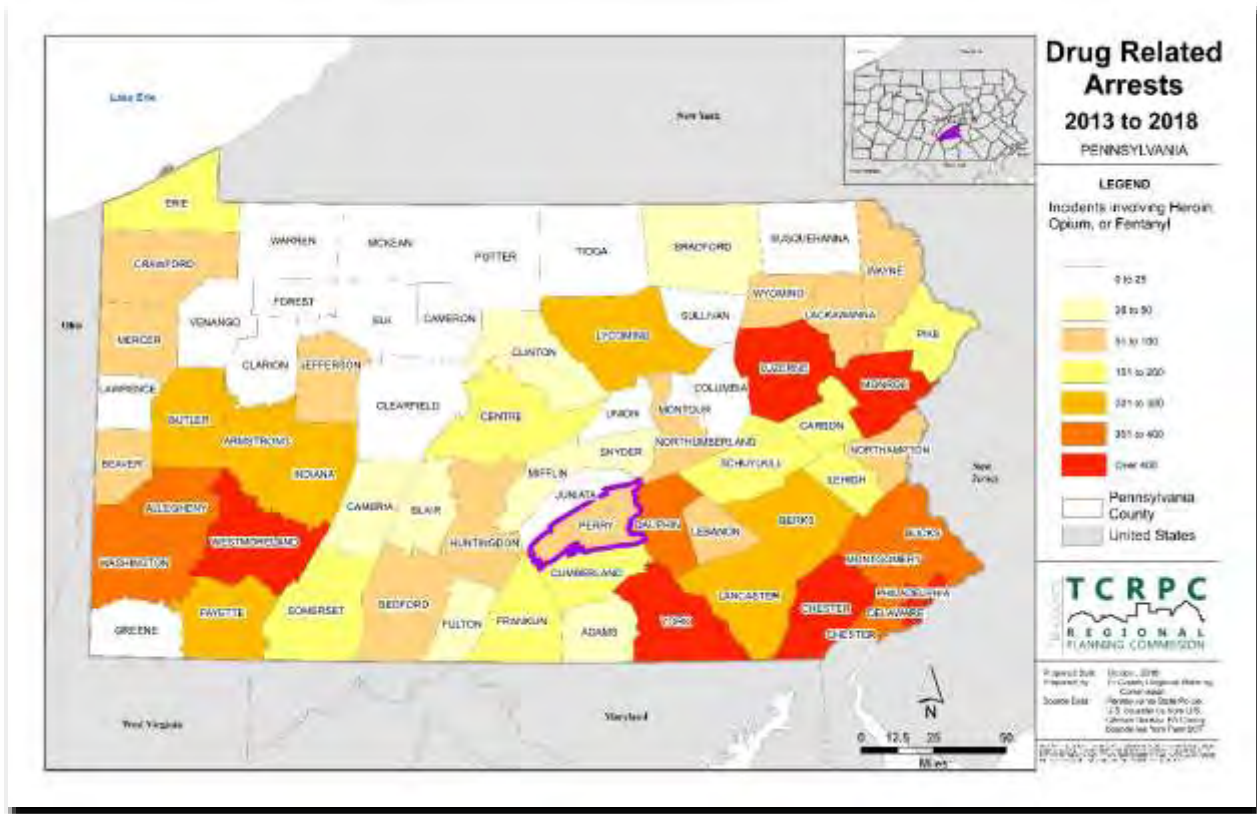
Steroids

These types of drugs are used as supplements to increase performance in athletics.

Community Impacts of Drug Abuse

Drug abuse is a problem that involves communities as much as it does individual users. Drug abuse can increase family stress, crime and significant health problems. Treatment programs, designed to reduce the negative effects of drug addiction within a community are costly to implement and are not always effective.

MAP 4.4



MAP 4.5

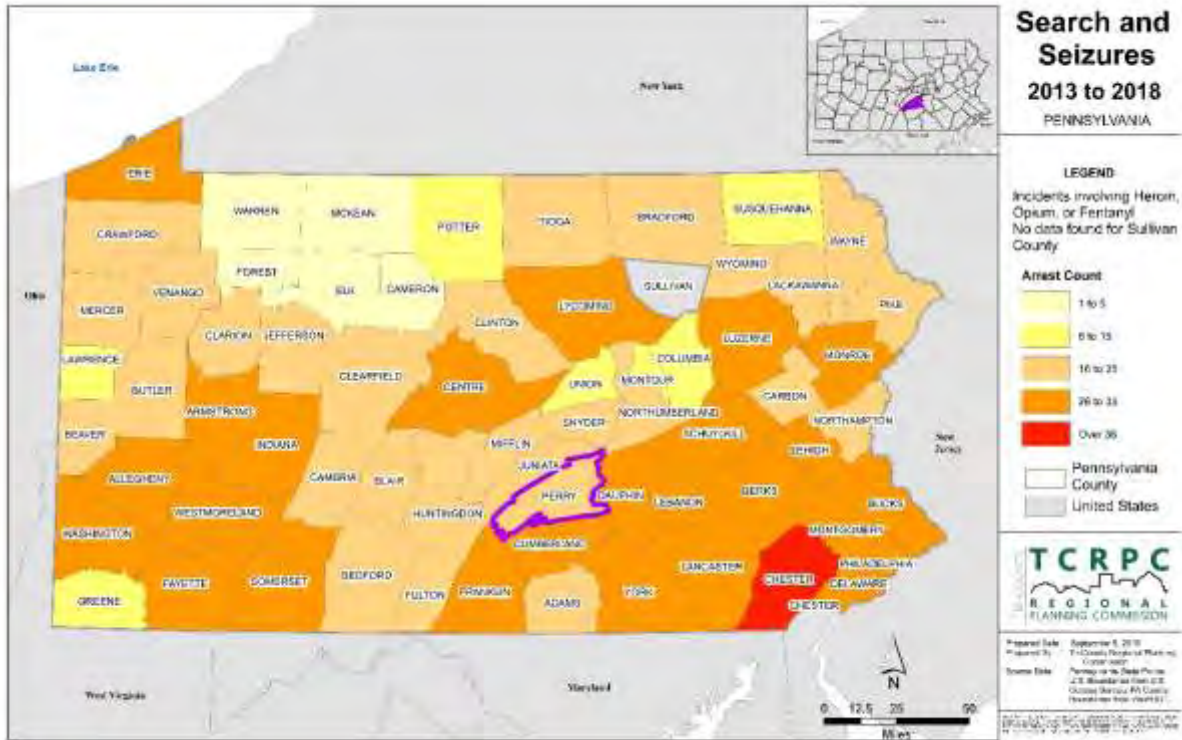


TABLE 4.11
DRUG ABUSE OFFENSES REPORTED
2000 AND 2010 COMPARISON

Data	2000	2010
Perry County		
Number of Offenses Reported	60	120
Offenses Per 1,000 Population	1.4	2.4
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	71%
Cumberland County		

Number of Offenses Reported	574	831
Offenses Per 1,000 Population	2.7	3.5
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	30%
Dauphin County		
Number of Offenses Reported	1,749	2,205
Offenses Per 1,000 Population	7.0	8.2
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	17%
Adams County		
Number of Offenses Reported	93	182
Offenses Per 1,000 Population	1.0	1.8
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	80%
Franklin County		
Number of Offenses Reported	500	428
Offenses Per 1,000 Population	3.9	2.9
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	-26%
Lancaster County		
Number of Offenses Reported	1,447	1,246
Offenses Per 1,000 Population	3.1	2.4
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	-23%

Lebanon County		
Number of Offenses Reported	340	380
Offenses Per 1,000 Population	2.8	2.8
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	0%
York County		
Number of Offenses Reported	603	1,699
Offenses Per 1,000 Population	1.6	3.9
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	144%
Pennsylvania		
Number of Offenses Reported	39,726	52,133
Offenses Per 1,000 Population	3.2	4.1
Percent Increase: 2000 to 2010 Per 1,000 Population	Not Available	28%

Source: *Pennsylvania Uniform Crime Reporting System*

Providing Treatment and Prevention

The longstanding problem in society with drug use has resulted in ongoing treatment and prevention in communities. The Substance Abuse and Mental Health Services Administration states that beginning prevention in grade school saves society billions of dollars overall. However, prevention efforts can fail. Drug treatment centers aim to provide the most comprehensive services for recovery success, yet the nature of substance addition indicates that no matter the immediate success of treatment, relapse is often inevitable at least once in the substance abusers lifetime. Recovery from addition is a life-long battle for most and consequently society is a part of that battle financially, legally and medically. There is a Cumberland-Perry Drug & Alcohol Commission. Its mission is to ensure that a full continuum of quality substance abuse prevention, intervention, and treatment services is available to all eligible Perry County residents. These services include; tobacco abuse prevention; student assistance program support; local treatment; and case management.

Drug abuse and addiction have negative consequences for individuals and for society. Estimates of the total overall costs of substance abuse in the United States, including productivity and health- and crime-related costs exceed \$600 billion annually. This includes approximately \$193 billion for illicit drugs, \$193 billion for tobacco, and \$235 billion for alcohol. As staggering as these numbers are, they do not fully describe the breadth of destructive public health and safety implications of drug abuse and addiction, such as family disintegration, loss of employment, failure in school, domestic violence, and child abuse. [National Institute on Drug Abuse] Adolescent Drug, Alcohol Use & Smoking Since 1989, the knowledge concerning alcohol, tobacco, other drugs and violence. The Pennsylvania Youth Survey (PAYS) of 6th, 8th, 10th and 12th grade public school students is conducted every two years. The 2011 findings from the PAYS build upon the data gathered during the five Commonwealth of Pennsylvania has conducted a survey of secondary school students on their behavior, attitudes and previous waves of the survey in 2001, 2003, 2005, 2007 and 2009, as well as the Generation at Risk survey, a biennial study of drug use prevalence rates that was conducted from 1989 through 1997. The data gathered in the PAYS serve two primary needs. First, the survey results provide an important benchmark for alcohol, tobacco and other drug (ATOD) use and delinquent behavior among young Pennsylvanians, and help indicate whether prevention and treatment programs are achieving their intended results. Second, the survey assesses risk factors that are related to these behaviors and the protective factors that guard against them. This information allows community leaders and school administrators to direct prevention resources to areas where they are likely to have the greatest impact. By administering the PAYS, Perry County has assessed the risk and protective factors its young people face. In 2011, 823 students in grades 8, 10 and 12 participated in the survey.

TABLE 4.12

PERCENTAGE OF YOUTH REPORTING

BEING OFFERED, GIVEN, OR SOLD AN ILLEGAL DRUG

	8th Grade	10th Grade	12th Grade	Overall
Perry County	10.7%	20.6%	10.7%	13.9%
Pennsylvania	7.2%	15.0%	18.3%	10.8%

Source: 2011 Pennsylvania Youth Survey (PAYS)

TABLE 4.13

PERCENTAGE OF YOUTH REPORTING SELLING DRUGS

	8th Grade	10th Grade	12th Grade	Overall

Perry County	3.8%	9.1%	3.7%	5.5%
Pennsylvania	1.7%	6.1%	9.8%	4.6%

Source: 2011 Pennsylvania Youth Survey (PAYS)

TABLE 4.14

PERCENTAGE OF YOUTH REPORTING BEING DRUNK OR HIGH AT SCHOOL

	8th Grade	10th Grade	12th Grade	Overall
Perry County	7.5%	14.0%	11.6%	10.7%
Pennsylvania	4.7%	11.5%	15.9%	8.5%

Source: 2011 Pennsylvania Youth Survey (PAYS)

TABLE 4.15

**PERCENTAGE OF YOUTH REPORTING USE OF ALCOHOL,
TOBACCO AND OTHER DRUGS OVER THEIR LIFETIME**

Substance	8th Grade	10th Grade	12th Grade	Overall
Alcohol				
Perry County	42.5%	63.0%	60.7%	54.1%
Pennsylvania	36.7%	53.2%	68.4%	44.0%
Cigarettes				
Perry County	23.4%	32.2%	39.6%	30.7%
Pennsylvania	15.6%	28.5%	43.1%	23.3%
Smokeless Tobacco				

Perry County	13.1%	21.7%	31.3%	20.9%
Pennsylvania	6.5%	13.4%	23.6%	11.5%
Marijuana				
Perry County	11.3%	26.3%	26.3%	20.2%
Pennsylvania	7.9%	24.9%	40.5%	19.0%
Inhalants				
Perry County	14.1%	9.4%	6.9%	10.6%
Pennsylvania	10.5%	8.7%	8.6%	8.6%
Cocaine				
Perry County	0.6%	4.3%	3.3%	2.5%
Pennsylvania	0.5%	1.5%	4.0%	1.6%
Crack Cocaine				
Perry County	1.6%	0.8%	1.4%	1.3%
Pennsylvania	0.5%	0.5%	1.2%	0.6%
Heroin				
Perry County	0.6%	1.2%	1.9%	1.1%
Pennsylvania	0.2%	0.3%	1.0%	0.4%
Hallucinogens				
Perry County	0.3%	3.1%	2.3%	1.8%

Pennsylvania	0.9%	3.2%	6.1%	2.5%
Methamphetamine				
Perry County	0.3%	0.8%	1.4%	0.8%
Pennsylvania	0.3%	0.4%	1.1%	0.5%
Ecstasy				
Perry County	0.0%	1.2%	2.8%	1.1%
Pennsylvania	0.7%	2.0%	5.5%	2.1%
Steroids				
Perry County	0.3%	0.0%	1.9%	0.6%
Pennsylvania	0.5%	0.8%	1.4%	0.8%
Any Illicit Drug (Other Than Marijuana)				
Perry County	17.0%	13.2%	15.1%	15.3%
Pennsylvania	11.3%	11.8%	15.4%	11.4%

Source: 2011 Pennsylvania Youth Survey (PAYS)

TABLE 4.16
PERCENTAGE OF YOUTHS REPORTING USE OF ALCOHOL,
TOBACCO AND OTHER DRUGS WITHIN PAST 30 DAYS

Substance	8th Grade	10th Grade	12th Grade	Overall
Alcohol				
Perry County	15.1%	36.2%	31.1%	26.3%

Pennsylvania	14.1%	29.9%	44.2%	23.3%
Cigarettes				
Perry County	6.8%	16.3%	17.2%	12.7%
Pennsylvania	5.3%	11.7%	19.4%	9.5%
Smokeless Tobacco				
Perry County	5.0%	12.8%	15.2%	10.3%
Pennsylvania	3.1%	7.3%	11.4%	5.7%
Marijuana				
Perry County	5.0%	15.2%	10.8%	9.9%
Pennsylvania	4.5%	14.9%	21.9%	10.7%
Inhalants				
Perry County	7.7%	5.5%	2.8%	5.7%
Pennsylvania	6.4%	4.0%	3.2%	4.5%
Cocaine				
Perry County	0.0%	1.6%	0.5%	0.6%
Pennsylvania	0.4%	0.8%	1.4%	0.7%
Crack Cocaine				
Perry County	0.6%	0.4%	0.0%	0.4%
Pennsylvania	0.5%	0.2%	0.5%	0.3%

Heroin				
Perry County	0.3%	0.8%	0.0%	0.4%
Pennsylvania	0.1%	0.1%	0.6%	0.2%
Hallucinogens				
Perry County	0.6%	2.4%	0.0%	1.0%
Pennsylvania	0.9%	1.7%	2.4%	1.3%
Methamphetamine				
Perry County	0.3%	0.8%	0.5%	0.5%
Pennsylvania	0.2%	0.3%	0.5%	0.3%
Ecstasy				
Perry County	0.0%	0.4%	1.4%	0.5%
Pennsylvania	0.5%	0.8%	2.4%	1.0%
Steroids				
Perry County	0.0%	0.0%	0.5%	0.1%
Pennsylvania	0.6%	0.4%	0.9%	0.5%
Any Illicit Drug (Other Than Marijuana)				
Perry County	8.3%	7.4%	4.1%	6.9%
Pennsylvania	7.3%	6.2%	6.8%	6.3%

Source: 2011 Pennsylvania Youth Survey (PAYS)

Inhalant use is more prevalent with younger students, perhaps because inhalants are often the easiest drugs for them to obtain. The health consequences of inhalant use can be substantial, including brain damage and heart failure.

TABLE 4.17
PERCENTAGE OF YOUTH REPORTING USE
PRESCRIPTION DRUGS OVER THEIR LIFETIME

Substance	8th Grade	10th Grade	12th Grade	Overall
Pain Relievers				
Perry County	6.6%	12.2%	9.3%	9.2%
Pennsylvania	3.7%	8.1%	13.1%	6.7%
Tranquilizers				
Perry County	0.0%	5.5%	2.8%	2.5%
Pennsylvania	1.1%	3.1%	6.1%	2.7%
Stimulants				
Perry County	2.2%	7.8%	3.7%	4.4%
Pennsylvania	1.2%	4.4%	8.2%	3.6%

Source: 2011 Pennsylvania Youth Survey (PAYS)

TABLE 4.18
PERCENTAGE OF YOUTHS REPORTING USE
OF PRESCRIPTION DRUGS WITHIN PAST 30 DAYS

Substance	8th Grade	10th Grade	12th Grade	Overall
Pain Relievers				

Perry County	4.0%	7.8%	3.8%	5.2%
Pennsylvania	3.3%	6.0%	7.9%	4.6%
Tranquilizers				
Perry County	0.9%	3.9%	1.4%	2.0%
Pennsylvania	0.9%	2.0%	3.2%	1.6%
Stimulants				
Perry County	2.2%	5.9%	0.9%	3.0%
Pennsylvania	1.1%	2.9%	4.9%	2.3%

Source: 2011 Pennsylvania Youth Survey (PAYS)

Some studies have reported increased usage of prescription drugs. Adverse health consequences related to prescription drug abuse can include addiction, physical dependence and the possibility of an overdose.

Perry County Human Service’s (PHS) Available Services to Perry County Residents Outpatient Treatment and Counseling Services Trained and competent counseling staff offers Perry County residents professional and confidential drug and alcohol services.

- Assessments and Evaluations

PHS offers drug and alcohol assessment services and referrals to treatment. It provides evaluation services to individuals arrested under Pennsylvania’s DUI laws.

- Drug and Alcohol Outpatient Treatment

PHS provides treatment to individuals struggling because of substance use. Counseling is also available to those suffering because of someone else’s substance abuse. Target populations include individuals, couples, families, adolescents, pregnant women, women with children and injecting drug users. Prevention and Intervention Services PHS’s prevention and intervention services involve educating people of all ages, providing information about alcohol, tobacco and other drugs, and giving them tools to make healthy choices for life.

- Resource Materials

PHS provides a variety of resources to schools, agencies, community organizations, parents or any requesting individual.

- Student Assistance Program (SAP)

PHS has a Student Assistance Program (SAP). The SAP teams function to identify and refer student who may be using substances or dealing with mental health concerns. PHS prevention staff serves on SAP teams in all four school districts in Perry County.

- School-Based Prevention Services

The above services include:

- Classroom presentations for all school age groups on topics ranging from substance abuse to making healthy choices
- Faculty in-service training
- Consultation services
- Educational support groups
- One-to-one student contacts
- Teen Choices and Consequences Group

PHS offers help to teens struggling with making healthy choices, with substance abuse, etc.

- Parents/Family Support Group

PHS offers help for parents /families struggling with a family member's substance abuse.

- Prison Education /Counseling

PHS offers educational programs and counseling services to inmates at the Perry County Prison.

- Community Prevention Services

PHS offers workshops and seminars to parents, organizations, and businesses including churches, civic groups and PTOs. By participating in local health fairs, PHS provides resources about substance abuse and makes information about its services readily available to the community.

- Information and Referral Services

PHS can help with information for locating proper services for someone's specific needs.

- Newsletter

PHS publishes a newsletter highlighting various topics which is distributed to individuals, Drugs of Choice by Clients in 2012

The table below identifies the drugs of choice of outpatient counseling clients of PHS in 2012.

TABLE 4.19

**PERRY COUNTY HUMAN SERVICES OUTPATIENT COUNSELING CLIENTS
DRUG OF CHOICE**

Drug of Choice	Primary	Secondary	Tertiary
Alcohol	102	21	15
Cocaine / Crack	7	16	10
Marijuana / Hashish	21	67	18
Heroin	32	13	6
Non-Prescription Methadone	3	0	0
Other Opiates / Synthetics	17	16	11
PCP	0	0	0
Other Hallucinogens	0	1	3
Methamphetamine	0	0	0
Other Amphetamines	0	0	0
Other Stimulants	0	0	1
Benzodiazepine	1	0	0
Other Tranquilizers	0	0	0
Barbiturates	0	0	0

Other Sedatives / Hypnotic	0	0	0
Inhalants	1	0	0
Over-the-Counter	0	0	0
Other	3	0	1

Source: Perry County Human Services

The table below indicates the age by primary drug of choice of outpatient counseling clients of PHS in 2012.

TABLE 4.20

**AGE AT ADMISSION TO PROGRAM OF PERRY COUNTY HUMAN SERVICES
OUTPATIENT COUNSELING CLIENTS BY PRIMARY SUBSTANCE**

Primary Substance	Age Group						
	Under 15	15-17	18-24	25-34	35-44	45-54	Over 54
Alcohol	0	4	21	33	23	14	7
Cocaine / Crack	0	0	0	0	6	1	0
Marijuana / Hashish	0	4	10	6	0	1	0
Heroin	0	0	14	13	4	1	0
Non-Prescription Methadone	0	0	0	3	0	0	0
Other Opiates / Synthetics	0	1	4	10	0	2	0
PCP	0	0	0	0	0	0	0

Other Hallucinogens	0	0	0	0	0	0	0
Methamphetamine	0	0	0	0	0	0	0
Other Amphetamines	0	0	0	0	0	0	0
Other Stimulants	0	0	0	0	0	0	0
Benzodiazepine	0	0	1	0	0	0	0
Other Tranquilizers	0	0	0	0	0	0	0
Barbiturates	0	0	0	0	0	0	0
Other Sedatives /Hypnotic	0	0	0	0	0	0	0
Inhalants	0	0	0	0	1	0	0
Over-the-Counter	0	0	0	0	0	0	0
Other	0	0	1	1	1	0	0

Source: Perry County Human Services

Non-Prescription PHS Drug & Alcohol Abuse Client Trends

The number of clients admitted to outpatient counseling for substance abuse has been increasing.

2008: 113

2009: 168

2010: 156

2011: 170

2012: 187

The above figures are the clients that were substance users. The figures do not include non-user family members, etc. included in the counseling service. It is worth noting that those substance users who have private insurance go out-of-county for counseling services.

Future Occurrences

As long as there are drugs there will continue to be abuse of drugs.

Vulnerability Assessment

When it comes to addictive drugs anyone taking them can become addicted. When it comes to being impacted by illegal drug activity as collateral damage the possibilities however low, do exist.

Probability

The probability of a large-scale illegal drug operation locating within the county is quite real. As with any business, the region's highway system provides ease of access to major markets in the Northeastern US. Because of this, the region's highways are clearly being used to traffic

Maximum Threat

Chemicals associated with clandestine methamphetamine labs are dangerous to surrounding neighborhoods. Explosions can take place causing damage to structures and/ or individuals. This illegal activity also comes with a certain brand of individuals who are not above taking the life of others. Whether it is from the poison they sell to their victims, to delivering a bullet to those that interfere with their operations, lives can certainly be jeopardized. Illegal drug activity is an ever-present concern for the public and especially for our emergency service providers.

Secondary Effects

Health Care Costs

Several of the most costly health care problems are the result of drug abuse. Included are lung disease from smoking, liver cirrhosis from alcohol, heart disease in users of cocaine, ecstasy and amphetamines, overdoses, HIV/AIDS, hepatitis, tuberculosis, stroke, high blood pressure, kidney disease and lung disease. Although 16,000 deaths annually are attributed to illegal drug use, this is probably a conservative number. Per the National Institute on Drug Abuse, more than half of people who have drug problems also have a mental health problem, such as: depression anxiety; bipolar disorder; ADHD (attention deficit/hyperactivity disorder); or antisocial personality disorder. People with mental health problems like these are twice as likely to also have drug problems. This is partly because drug abuse and mental health problems affect the same parts of the brain.

According to the Marin Institute, annual health care expenditures for drug related problems exceed \$100 billion, not including alcohol-related health care issues.

Child Abuse and Neglect

According to the National Institute on Drug Abuse, 50% to 80% of child abuse and neglect cases involve drug abuse by the children's parents. Endangered children put into foster care from their parent's drug abuse cost approximately \$904 million in 2005.

Risking Employment

Employed drug users are more likely than non-substance users to miss work frequently and have an unstable work history. Loss of productivity at work attributed to the drug user is due to illness, premature death or incarceration total over \$300 billion in a given year according to the Substance Abuse and Mental Health Services Administration. Additionally, the National Drug Intelligence Center notes that job related accidents and stealing from the employer are risks that occur due to drug users attending work intoxicated.

Family Stress

Alcohol and drug addiction is pervasive within the United States, affecting approximately 11% of U.S. families. This can include parents, brothers, sisters, and grandparents – anyone who is part of the home. In addition to causing marital stress, drug additions also place children of users at greater risk of emotional problems, physical problems and learning difficulties. These children may engage in patterns of codependent behavior, merely enabling a parent's drug abuse. Drug abuse can also harm an unborn child.

Crime

Researchers have repeatedly asserted close correlations between drug abuse and criminal activity. According to the National Justice Institute, 80% of crimes committed by criminal offenders, parolees and probationers involve use of "multipliers of crime" such as alcohol or illegal substances. In order to support expensive drug habits, users sometimes engage in crimes such as robbery, prostitution or even aggressive panhandling. Crimes related to drug abuse not only include stealing to obtain money needed to buy drugs, but also buying or selling drugs and offenses related to the lifestyle of drug abusers that result in illegal activities. Half of those arrested for serious crimes, including murder, robbery and assault were under the influence of illegal drugs. The Bureau of Justice Statistics reports that approximately 70% of state prisoners and 57 percent of federal prisoners used drugs on a regular basis before incarceration. The economic costs of crime include law enforcement, court and incarceration. According to the Substance Abuse and Mental Health Services Administration, the estimated economic cost to society for resources related to substance abuse crime and criminal justice is over 55 billion dollars in a given year.

For the Pennsylvania Uniform Crime Reporting System, drug abuse violations include all violations of state laws and local ordinances relating to the unlawful possession, sale, use, growing, manufacture, and making of narcotic drugs.

Other Effects

Nationally, more than 75% of domestic violence cases were committed by a person using alcohol or drugs. Drugs, often combined with alcohol, are used by 10% to 22% of drivers nationally involved in crashes according to the National Institute on Drug Abuse. In 2005, exploding methamphetamine labs cost \$61 million for injuries, deaths, and toxic waste cleanup. One-third of homeless people suffer from drug or alcohol abuse.

Hazardous Materials Release

Location and Extent

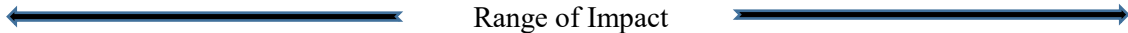
One of the greatest threats to those who reside in the Commonwealth is the constant production, storage, use, and transportation of hazardous materials. The release of these materials from a facility is less dangerous than the release of them while being transported. Hazardous materials include flammable liquids, solids, and gases, combustible liquids, explosives, blasting agents, radioactive materials, oxidizing materials, corrosive materials, poisons, refrigerated liquids, hazardous waste/substances, and other regulated material. The City of Philadelphia and the Delaware Valley Region, approximately 112 miles southeast of Perry County, make up one of the leading industrial trade complexes in the nation. With the numerous forms of transportation in Perry County, hazardous materials such as chemicals and fuels are frequently transported through the County. The carriers of hazardous materials, however, must have response plans in place in the event of an accident.

Any facility in Pennsylvania that uses, manufactures, or stores hazardous materials must comply with Title III of the Superfund Amendments and Reauthorization Act (SARA). This is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). They must also comply with the reporting requirements, as amended, in Pennsylvania’s Hazardous Materials Emergency Planning and Response Act (1990-165). Information about the chemicals that are being manufactured or processed in facilities can be found in the U.S. Environmental Agency’s (USEPA’s) Toxic Release Inventory (TRI) database.

Range of Magnitude

TABLE 4.21

RANGE OF POTENTIAL OUTCOMES FOR HAZARDOUS MATERIALS SPILL

		
Range of Impact		
Level 1 Low	Level 2 Medium - High	Level 3 Severe
Contained On Site Without Damage to Property or Harming the Health of Individuals	Contained On Site Damaging Property or Harming the Health of Individuals On Site	Spill Leads to Secondary Hazard Causing Harm To Neighboring Property and/or the Health of Individuals

Past Occurrence

The Commonwealth experienced 1,000 spills in 2003, the vast majority of them on highways. These spills cost the Commonwealth approximately \$2.5 million/year. The National Response

Center lists 24 hazardous material instances occurring in Perry County between Dec 1990 and January 2008. The table below outlines the spills that occurred in Perry County between 1990 and January 2008. Of the 24 spills, 10 were oil products and 3 were automotive gas.

TABLE 4.22**Perry County Hazardous Material Spills/ Incident Reporting, 1990-2008**

Incident (Call) Date	Type of Incident	Medium Affected	Identified City (Postal Area)	Material Name
12/19/1990	Pipeline	Land	-	Oil, Fuel: No. 2
06/12/1991	Mobile	Land	-	Unknown Oil, Red In Appearance
08/17/1992	Fixed	Water	-	Gasoline: Automotive (4.23G Pb/G)
08/17/1992	Fixed	Water	-	Oil, Fuel: No. 2-D
04/30/1995	Unknown	Water	-	Oil, Edible: Vegetable
08/16/1995	Mobile	Land	-	Potassium Silicate
08/16/1995	Mobile	Land	-	Oil, Fuel: No. 2-D
01/26/1996	Unknown Sheen	Water	-	Unknown Oil
07/06/1996	Railroad	Rail Report (N/A)	-	-
11/19/1997	Fixed	Water	-	Unknown Oil
05/28/1998	Fixed	Unknown	-	Oil, Misc: Motor
05/28/1998	Fixed	Unknown	-	Gasoline: Automotive (Unleaded)
10/04/1998	Fixed	Air	-	Chlorine
05/13/2000	Fixed	Air	-	Natural Gas
09/01/2000	Storage Tank	Soil	-	Oil, Fuel: No. 2
04/25/2001	Mobile	Ballast	-	Oil: Diesel
08/01/2001	Railroad Non-Release	Rail Report (N/A)	-	-
08/07/2003	Storage Tank	Water	-	Oil, Misc: Motor
12/08/2004	Unknown Sheen	Water	-	Unknown Oil
09/19/2005	Mobile	Land	-	Oil, Misc: Mineral
12/30/2005	Railroad	Non-Release (N/A)	-	-
05/12/2006	Railroad	Ballast	-	Battery Acid (Corrosive #8)
06/01/2006	Mobile	Water	-	Oil: Diesel
01/02/2008	Railroad	Ballast	-	Gasoline: Automotive (Unleaded)
05/31/2011	Individual (oil applied to driveway for dust suppression)	Land	Newport	Oil, Misc: Motor

03/06/2012	Mobile (tractor trailer fuel tank rupture)	Water	Millerstown	Oil: Diesel
09/04/2013	Individual (burning shingles)	Air	Landisburg	Asphalt and tar
04/09/2014	Business (collecting oil for recycling without documentation)	Air and Water	Duncannon	Oil
10/21/2014	Individual (burning trash and oil)	Air and Water	New Bloomfield	Oil
09/20/2016	Individual (burial of containers with contents)	Land and Groundwater	Duncannon	Oil and Various Chemicals
08/06/2018	Business (discharge)	Water	New Bloomfield	Oil or Sewer

Source: United States Coast Guard National Response Center

Future Occurrence

Tractor Trailer volumes on the HATS Region highway network are predicted to increase with the 20% increase in trucking and warehousing facilities from 2010 - 2017 according to the HATS Regional Freight Plan.

In Perry County five boroughs and seven townships are traversed by two significant U.S. Traffic Routes. Truck transport is ever-present and with this the risk of spills.

Considering railroad transport based on prior derailment history, Marysville Borough could see additional incidents. Other communities of noteworthy concern are Duncannon and Newport Borough with the tracks elevated through each town.

Vulnerability Assessment

A hazardous materials spill can be the result of human carelessness, an intentional act, or a natural hazard. Human carelessness occurs predominantly during the manufacturing, transporting, or storing of the material. An intentional act would be either a terrorist act, criminal act, or act of vandalism. A hazardous materials spill can be a secondary effect of a natural hazard (e.g., flooding, earthquake, or severe weather). Perry County contains two U.S. highways (U.S. Route 11/15 and U.S. Route 22/322). Truck traffic on these transportation routes makes Perry County susceptible to hazardous material spills.

Crucial factors in a hazardous materials spill include location, weather conditions, and response. The location of a spill is critical for several reasons. The material could spill in a highly populated area, leak into a waterway, or be spilled in some other area that would cause other

secondary effects. Those who are closest to the spill are at the greatest risk, but some hazardous materials can travel great distances. Weather conditions play a large role, with mild breezes carrying hazardous gases and fumes long distances. Air temperature is also a determining factor of how far the material will travel by air. Contaminated waterways and even rainfall can have an impact on the scope of the spill. Finally, the response to the incident can determine the extent of the damage. If the closest response team is miles from the incident, the material may have time to spread into the ground and waterways or into the air. However, all these factors depend on the type of material released.

Probability

The probability of a hazardous materials spill occurring in Perry County is high. The volume of automobile and truck traffic on U.S. Route 11/15 increases the frequency of accidents and the probability of an accident resulting in a release of hazardous materials. According to PennDOT's 2006 traffic count data, U.S. Route 11/15 has an annual average daily traffic count (AADT) of 20,000 in the eastern edge of the county. Similarly, U.S. Route 22/322 sees an AADT of 35,000 in eastern Perry County.

Carelessness, human and technological error, and criminal behavior will continue to result in hazardous material spills. While larger spills of reportable quantities will occur less frequently, smaller releases of material will continue to occur throughout the year.

Maximum Threat

The maximum threat to the County is along major transportation routes and connector roads, which are in close proximity to heavily populated urban areas. Such roadways in Perry County include U.S. Route 22/322 and U.S. Route 11/15.

Secondary Effects

If a spill occurs, its impact can be measured on environmental, economic, and societal factors. If the materials spilled are flammable, both urban and rural fires can occur. The greatest secondary effect is likely associated with transportation accidents that follow from spills on major transportation routes.

Mass Food or Animal Feed Contamination

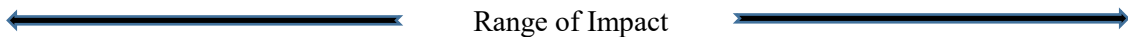
Location and Extent

A foodborne illness, sometimes called food poisoning, can be contracted by ingesting food or water contaminated by a virus, bacteria, parasite or chemical. There are over 250 types of foodborne diseases. A contamination can occur at any time in the food’s supply chain, from its growth (plants) or birth (animals) to packaging and distribution. Most cases of food contamination are accidental and due human error/accident in handling, raising, processing, cleaning or cooking. Raw or undercooked foods are particularly vulnerable to contamination. Live animals are also able to pass on certain infections through handling.

The contamination of animal feed also has the possibility to effect the safety of food on a large-scale level and lead to foodborne illness in humans. Animal feed can rightly be considered the first step on the “farm-to-fork” ladder. Contaminated feed for any farm animal can in turn, lead to contaminated food being consumed by humans.

In rare cases, the contaminant can be can be introduced deliberately to the food with the intent of causing harm. This is known as tampering or “food fraud”. Food fraud is an umbrella term that includes any kind of alteration to a food product in an attempt to deceive or mislead a consumer, regardless of whether or not any bodily harm was caused or intended.

TABLE 4.23
RANGE OF POTENTIAL OUTCOMES FOR MASS FOOD OR ANIMAL FEED CONTAMINATION

			
Low	Medium	Medium - High	Severe
Sore/Upset Stomach	Sore/Upset Stomach with Vomiting	Illness Requiring Hospitalization	Death

Past Occurrence

The Center for Disease Control (CDC) is federal body responsible for investigating and defining the source of contamination outbreaks.

2018 Outbreak Investigations

- Salmonella (Typhimurium, Concord, Infantis, Newport, Enteritidis, Sandiego, Mbandaka, Adelaide, Braenderup, Montevideo)
- Lysteria monocytogenes
- E.coli

- Cyclospora
- *Vibrio parahaemolyticus*

Outbreaks Linked to Animals and Animal Products (various years)

- Salmonella: Live poultry, frozen rodents, chicks and ducklings, pet hedgehogs, Guinea pigs, pet bearded dragons, pet crested geckos, pet rats, water frogs, dairy bull calves, dry dog food, dry pet food.
- Campylobacter Infections: Pet store puppies
- Psittacosis: Poultry being raised at poultry plants
- Seoul Virus Infections: Pet rats
- Hantavirus Infections: Various rodents
- Lymphocytic choriomeningitis virus (LCMV): Various rodents

Future Occurrence

It remains quite possible for contaminated food to reach an individual's plate or the trough in front of an animal's stall or pen. Recalls alert and provide warning of danger but they do not 100% prevent us from ingesting something we or our animals shouldn't. It can happen anywhere at any time and all should take advantage of messaging alerts for recalls on any food product.

The frequency of contamination recalls on packaged food products has been on the rise impact is directly related to our reliance on processed food. The more farm-to-fork buying purchases will help insulate the buying public although many of the same elements of food contamination can occur locally as well.

Vulnerability Assessment

Anyone who consumes contaminated food can contract a foodborne illness. Especially vulnerable groups include children young than 5 (five) years of age and adults older than 65 (sixty-five) years of age, pregnant women, and those with compromised or weakened immune systems.

Handling (rather than ingesting) contaminated animals can still result in the bacterial, viral or chemical infections that create foodborne illnesses. Pet turtles, live poultry, hedgehogs and various types of rodents are the most common carriers of contaminants, with the most common bacterial infection being various types of salmonella. Food preparers/handlers can also spread viruses and bacteria to foods by contact.

Changes to the animal feed industry have also increased the risk of contamination. In the year 2000 it was estimated that there were approximately 8,000 feed mills in the United States, many of which pull their inputs (animal by-products, grains, vegetables, etc...) from a variety of sources. Global animal feed trading has also stepped up in prominence in recent years. The vast amount of producers of animal feed, their variety of sources, and their ability to reach widespread locations not only increase the chance of a contamination, but also increases the chance a contamination could be more widespread than prior years.

When a food or feed product is found to be contaminated, the most likely response by the producer or distributor will be to issue a *recall*. This leads to vulnerability within itself, as products could already be in the possession of the consumer when the contamination is discovered and the recall is issued. Food recalls are categorized based upon their risk level that would be posed to the health of those who might consume the food.

While recalls of products from big name companies are likely to be widely reported within the media, consumers without internet access, cellphone service, or cable television may still find themselves at a disadvantage.

Probability

One in six Americans get sick from eating contaminated food every year, which equates to roughly 48 million people.

Maximum Threat

Roughly 3,000 people a year die from food-borne illness. Depending on the type of infection other long-term complications can also occur, Other long-term complications can also occur, including the development of irritable bowel syndrome (IBS), Guillain-Barre syndrome, reactive arthritis, Hemolytic uremic syndrome (HUS), or problems with kidney function.

Secondary Effect

Dehydration, nausea, vomiting, diarrhea, abdominal pain, fever, and chills are common symptoms of food poisoning. More serious infections can also result in neurological symptoms such as blurred vision and dizziness. Depending on the type of bacteria or virus, symptoms can manifest anywhere from 1 hour to 28 days after the initial contact with the contaminant.

Sources:

USDA, *Responding to a Food Recall Procedures for Recalls of USDA Foods, 2012* https://fns-prod.azureedge.net/sites/default/files/Responding_Food_Recall_FNS_Final_May_30_2014.pdf

CDC, <https://www.cdc.gov/healthypets/outbreaks.html> and <https://www.cdc.gov/foodsafety/outbreaks/multistate-outbreaks/outbreaks-list.html> and <https://www.cdc.gov/foodsafety/index.html>

Mayo Clinic, <https://www.mayoclinic.org/diseases-conditions/food-poisoning/symptoms-causes/syc-20356230>

PA Department of Health, <https://www.health.pa.gov/topics/disease/Pages/Foodborne-Illness.aspx>

Nestle Corporation, <https://www.nestle.com/asset-library/documents/library/documents/suppliers/food-fraud-prevention.pdf>

Food Safety Net Services, <http://fsns.com/news/what-is-food-fraud>

National Institute of Diabetes and Digestive and Kidney Diseases,
<https://www.niddk.nih.gov/health-information/digestive-diseases/foodborne-illnesses>

John A. Crump, Patricia M. Griffin and Frederick J. Angulo. “Bacterial Contamination of Animal Feed and Its Relationship to Human Foodborne Illness”. *Clinical Infectious Diseases*, Volume 35, Issue 7. <https://academic.oup.com/cid/article/35/7/859/307143>

Nuclear

Location and Extent

Following the accident at Three Mile Island in 1979, the NRC reexamined the role of emergency planning for protection of the public in the vicinity of nuclear power plants. The NRC issued regulations requiring that before a plant could be licensed to operate, the NRC must have “reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.” The regulations set forth 16 emergency planning standards and define the responsibilities of licensee, and state and local organizations involved in emergency response. The added feature of emergency planning to the NRC’s “defense-in-depth” philosophy provides that, even in the unlikely event of a release of radioactive materials to the environment, there is reasonable assurance that actions can be taken to protect the population around nuclear power plants.

Through a Memorandum of Understanding (MOU), the Nuclear Regulatory Commission (NRC) and FEMA share federal oversight for radiological emergency response planning matters for licensed nuclear power plants. It is such that their mutual efforts will be directed toward more effective plans and related preparedness measures at and in the vicinity of nuclear reactors and fuel cycle facilities. The Memorandum of Understanding between the agencies was signed on January 14, 1980 in response to the president’s decision of December 7, 1979, stating that FEMA: coordinates all federal planning for the *off-site* impact of radiological emergencies; take the lead for assessing *off-site* radiological emergency response plans and preparedness; makes findings and determinations as to the adequacy and capability of implementing *off-site* plans; and communicates those findings and determinations to the NRC. The NRC reviews those FEMA findings and determinations in conjunction with the NRC *on-site* findings to determine the overall state of emergency preparedness.

A separate MOU, dated October 22, 1980, deals with NRC and FEMA cooperation and responsibilities in response to an actual or potential radiological emergency. Operations Response Procedures have been developed that implement the provisions of the Incident Response MOU. These documents are intended to be consistent with the Federal Radiological Emergency Response Plan, which describes the relationships, roles, and responsibilities of federal agencies for responding to accidents involving peacetime nuclear emergencies.³

Regulations

For planning purposes, FEMA and the NRC have defined the plume exposure pathway emergency planning zone (EPZ) – also known as an “at risk area” – consisting of an area about 10 miles in radius, and an ingestion pathway EPZ about 50 miles in radius around each nuclear power plant. EPZ size and configuration may vary in relation to local emergency response needs and capabilities as affected by such conditions as demography, topography, land characteristics, access routes, evacuation routes, and jurisdictional boundaries.

³ Nuclear Regulatory Commission; www.nrc.gov

Counties within the ingestion exposure pathway are considered “support counties.” FEMA and the NRC’s requirements for emergency planning are contained in Title 10 of the Code of Federal Regulations, Part 50.47 and cover the following topics:

- assignment of responsibility;
- emergency response support and resources;
- notification methods and procedures;
- public education and information;
- accident assessment;
- radiological exposure control;
- recovery and reentry planning and post-accident operations;
- responsibility for the planning effort;
- development, periodic review and distribution of emergency plans;
- on-site emergency organization;
- emergency classification system;
- emergency communications;
- emergency facility and equipment;
- protective response;
- medical and public health support;
- exercises and drills; and
- radiological emergency response training.

The Pennsylvania Emergency Management Agency (PEMA), in conjunction with the Commonwealth’s risk counties — which includes Perry — has identified the specific EPZ around each of the five nuclear power plants in Pennsylvania. As such, there are on-site and off-site Radiological Emergency Response Plans for each power plant. Each plant owner is required to exercise its emergency plan with off-site authorities at least once every two years to ensure state and local officials remain proficient in implementing the plan.

Range of Magnitude

The following four classification levels have been offered up by the Nuclear Regulatory Commission to improve identification of an incident.

TABLE 4.24

EMERGENCY CLASSIFICATION LEVELS

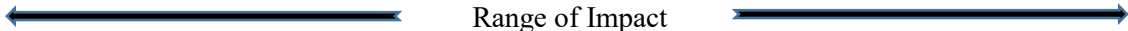
Notification of Unusual Event	This is the least serious of the four levels. The event poses no threat to you or plant employees, but emergency officials are notified. No action by the public is necessary.
Alert	An alert is declared when an event has occurred that could reduce the plant’s level of safety, but backup systems still work. Emergency

	agencies are notified and kept informed, but no action by the public is necessary.
Site Area Emergency	A Site Area Emergency is declared when an event involving major problems with the plant's safety systems has progressed to the point that a release of some radioactivity into the air or water is possible, but is not expected to exceed Environmental Protection Agency Protective Action Guidelines (PAGs) beyond the site boundary. Thus, no action by the public is necessary.
General Emergency	This is the most serious of the four classifications and is declared when an event at the plant has caused a loss of safety systems. If such an event occurs, radiation could be released that would travel beyond the site boundary. State and local authorities will take action to protect the residents living near the plant. The alert and notification system will be sounded.

Source: U.S. Nuclear Regulatory Commission (NRC)

TABLE 4.25

RANGE OF POTENTIAL IMPACT FROM NUCLEAR INCIDENT

			
Range of Impact			
Class 1 (Low)	Class 2 (Medium)	Class 3 (High)	Class 4 (Severe)
Unusual Event	Alert	Site Area Emergency	General Emergency

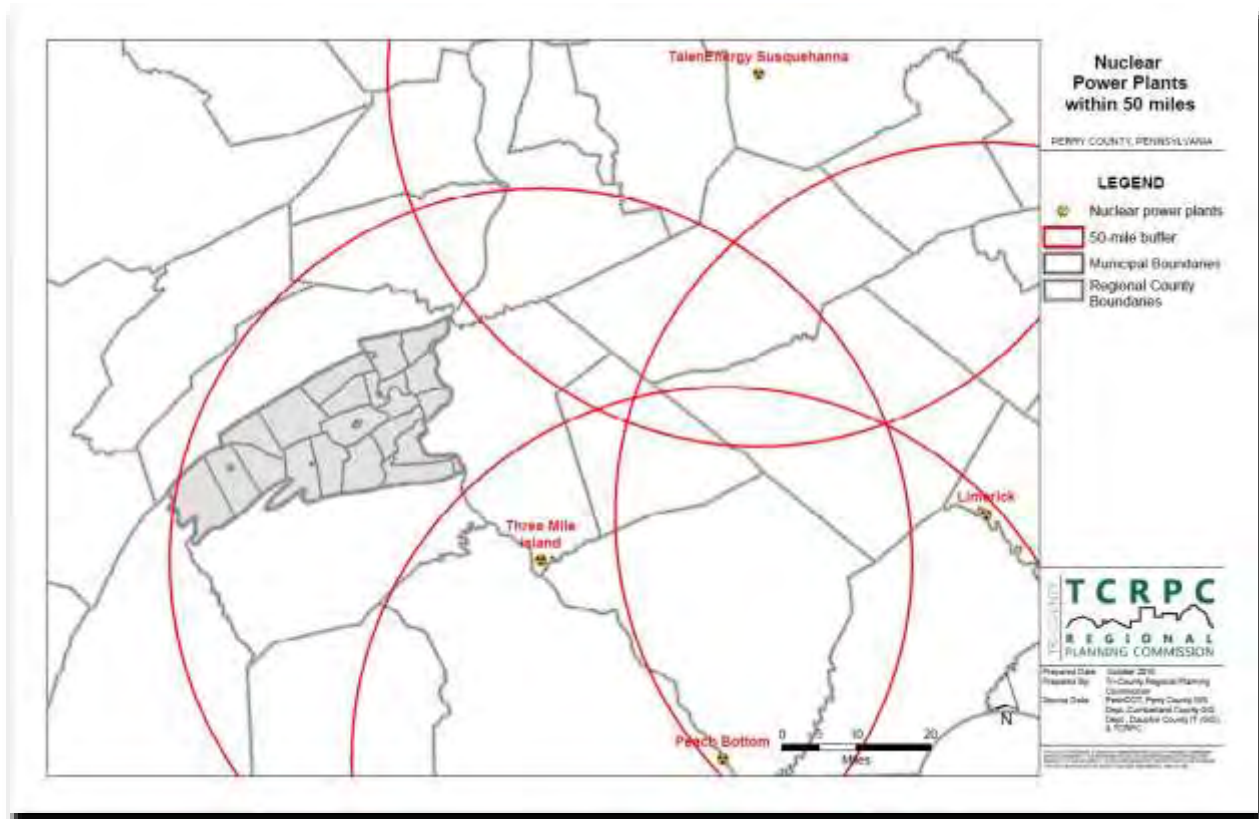
Past Occurrence

Pennsylvania is home to the worst nuclear facility accident in the history of the nation. Although it did not occur in Perry County, the effects of it were felt nationwide. After the accident at Three Mile Island, state, county, and municipal entities designed plans for handling future accidents so that safety could be assured for all residents. However, many “unusual events” and “alerts” occur every year at the nuclear facilities across the nation. These are events that require the notification of the local emergency managers. For example, in 1997 alone, there were 40 notifications of unusual events and three alert-level notifications nationwide.



Three Mile Island

MAP 4.6



Future Occurrence

With the decommissioning of the nuclear plant on Three Mile Island, regular operations will gradually come to a halt and with it, most of the fear of revisiting the events of the late seventies. The remaining concern will be the potential for a radioactive release from a breach of the containment facility, as long as spent fuel is stored there.

While domestic nuclear incidents will be significantly reduced for the county, the threat of a nuclear war has never left. The county is at the mercy of rogue nations and what they deem to be suitable targets.

Vulnerability Assessment

As seen below, there are three different types of nuclear accidents: criticality, loss of coolant, and loss of containment.

TABLE 4.26
NUCLEAR ACCIDENT CATEGORIES

Criticality	Accidents that involve a loss of control of nuclear assemblies or power reactors
Loss-of-Coolant	Accidents that involve a reactor coolant system experiencing a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating makeup system
Loss-of-Containment	Accidents that involves the release of radioactivity and have involved materials such as tritium, fission products, plutonium, and natural, depleted, or enriched uranium

Source: U.S. Nuclear Regulatory Commission (NRC)

In the wake of an accident, the primary nuclear exposure for the immediate area around a nuclear power plant can last from hours to months. The health of the citizens in the surrounding area is the primary immediate concern; next, is the long-term impact on the environment. Livestock, livestock by-products, and crops can be contaminated for many years after a nuclear incident. The health effects reported from the psychological stress of individuals living in the immediate area will strain stress management and disaster psychology resources to the limit.

The closest nuclear facility to Perry County is Three Mile Island nuclear power plant, located approximately 42 miles southeast of New Bloomfield in Londonderry Township. Three Mile Island nuclear power plant is a 816-megawatt facility Exelon and operated by AmerGen Energy Company.⁴ Perry County is located within the 50-mile ingestion zone radius for this facility.

⁴ Energy Information Administration; www.eia.doc.gov

Three Mile Island Unit 1 was shut down on September 20, 2019 and will be decommissioned and dismantled. The reactor fuel is anticipated to be transported to the Independent Spent Fuel Storage Facility on Three Mile Island Property by 2022. This process will gradually reduce residual radioactivity of structures and equipment on site.⁵

Probability

Pennsylvania is home to the only nuclear power plant in the United States to have reached the emergency classification level of “General Emergency.” Since the 1979 accident at the Three Mile Island nuclear power plant, nuclear power has become one of the safest and most heavily regulated industries in the nation. The frequency of nuclear accidents in the United States is extremely low, with a frequency of occurrence approximately once every 30 years or less. Likewise, the likelihood of another incident at Three Mile Island is low.

Maximum Threat

The effects and impacts of a nuclear threat depend on the type of radiation released, the duration of the release, the volume of the release, and the existing weather conditions, such as wind speed and direction. Since Perry County is located well outside the 10-mile “at-risk area” for the Three Mile Island facility, the risk associated with a Three Mile Island incident is dramatically lessened. Should a nuclear incident occur, the greatest threat and highest impact would be to the health and safety of the citizens. Additionally, the potential exists for catastrophic impacts on property, facilities, infrastructure, essential services, the environment, and the County’s economy. Dense population areas and outlying residential areas could experience the greatest impact as a result of radiation ingestion.

Secondary Effects

Power failure is the most common secondary effect of a nuclear incident. More serious secondary effects would include public health emergencies, resulting from widespread radionuclide ingestion and/or radiation fallout.

Radionuclide contamination could have lasting impacts on structures, facilities, and infrastructure in the affected areas, primarily in urban and residential areas. Radionuclide ingestion by domesticated farm animals could force agricultural product embargos, placing severe strain on the economy. Radiological particulate contamination of the environment could impact natural resources, disrupt service delivery, and cause work cessation and evacuations. Other response measures that result from the event could damage the local economy.

⁵ Exelon Corporation; <https://www.exeloncorp.com/locations/three-mile-island-decommissioning>

PIPELINE INCIDENT

Location and Extent

There are currently four pipelines running through Perry County. The following map describes the approximate placement as each as they traverse the County. Three of the four run from Juniata County to Cumberland County. One passes the Susquehanna River into Dauphin County to the east.

The pipelines transport natural gas (NG), NG liquids, and liquid petroleum gas (LPG). Sunoco’s Mariner East 2 pipeline once completed will be able to transport propane, ethane and butane.

MAP 4.7

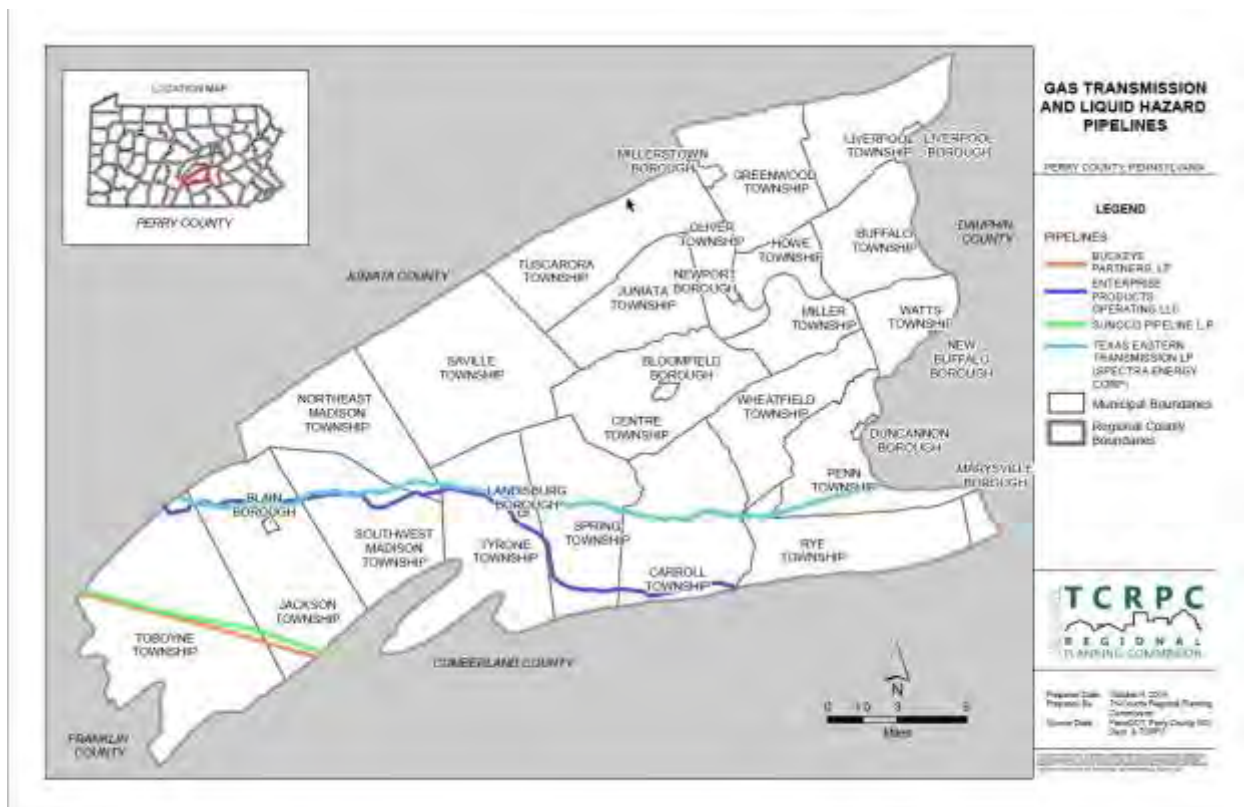


TABLE 4.27

APPROXIMATE PIPELINE MILES AND ESTIMATED RIGHT-OF-WAY AREA

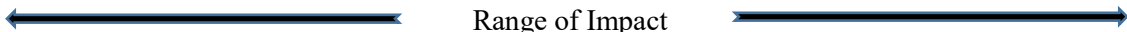
Company Name	Approximate Lineal Pipeline Mileage	Estimated Pipeline Rights-of-way Area
Buckeye Partners. L.P.	10.56 miles	42.24 acres
Enterprise Products Operating, L.L.C.	27.94 miles	Not readily available
Sunoco Pipeline, L.P.	10.71 miles	64.91 acres
Texas Eastern Transmission, L.P.	31.58 miles	382.77 acres

Source: The estimated rights-of-way area calculation based on a uniform 50’ rights-of-way width for Sunoco Pipeline, L.P.; a 100’ rights-of-way width for Texas Eastern Transmission, L.P. both verified by surveys; Buckeye Partners. L.P. pipeline rights-of-way width is variable ranges from 16’ to 50’ considering this an average of 33’ was applied; No information was readily available for Enterprise Products Operating, L.L.C. regarding its rights-of-way widths

Range of Magnitude

TABLE 4.28

RANGE OF POTENTIAL IMPACTS FROM PIPELINE INCIDENT

 Range of Impact					
Low	Low-Medium	Medium	High	High-Severe	Severe
Leak Immediately Contained	Leak with Air or Water Contamination	Leak with Explosion or Uncontained Fire	Leak Causing Explosion and/or Fire with Damage to Buildings On-site	Leak Causing Damage to Buildings Off-site	Leak Causing Loss of Life

Past Occurrence

Since 1986 there has only been one recorded pipeline breach and this was attributed to corrosion. This was associated with a May 13, 2000 incident along the Texas Eastern Transmission Corporations (Duke) pipeline, which was installed in 1958. The damages were identified to be affected by corrosion to the line, on the order \$120,582 at that time. The incident was identified as significant by the Pipeline Safety Trust, which provided a summary table of such incidents running from 1986 to 2009. The Trust’s statewide incidents map is an accessible resource revealing the location of the incidents.

Future Occurrence

The potential for an incident has increased with the addition of two additional pipelines for the Sunoco Mariner East and Mariner 2 pipeline projects. These projects are located in the western end of the County in Toboyne and Jackson Townships.

Vulnerability Assessment

Perry County remains vulnerable to a pipeline incident as long as facilities are present within the county. There are 2,539 buildings within 1,000’ of pipelines running through the county according to the GIS information analyzed for this hazard.

TABLE 4.29

BUILDINGS LOCATED WITHIN 1000’ OF A PIPELINE

Number of Building Footprints Within 1000’ of a Pipeline	Municipality
686	Carroll Township
547	Spring Township
430	Tyrone Township
263	Southwest Madison Township
142	Jackson Township
134	Toboyne Township
13	Marysville Borough

9	Rye Township
1	Wheatfield Township

Source: Perry GIS (building footprints)

Probability

As mentioned earlier, such an event has already occurred here. The chance of a pipeline related event is always going to remain with Perry County as long as pipelines are present.

Maximum Threat

The maximum threat of an incident in the county would likely be the start of a wildfire or impacts to housing and businesses.

Secondary Effect

An incident having an impact on other facilities such as the transportation, electric, cable and communications networks, would all bring about secondary effects ranging from inconveniences to inhibiting assistance during an emergency.

Sources:

Pipeline Safety Trust, <http://pstrust.org/>

- Incident Map: <http://pstrust.org/maps/pa-incidents.php>
- Table: Natural Gas Transmission Pipeline Incidents 1986-2009

Terrorism (Any Acts Including Agri- and Cyber)

Location and Extent

Terrorism is the unlawful use or threat of the use of force and 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 (28 CFR 0.85).

The major weapons and activities of terrorists include: chemical and biological agents; radiological dispersion devices (RDD commonly referred to as “dirty bombs”); nuclear weapons; conventional explosives; improvised explosive devices (IED which include incendiary devices); kidnappings; hijackings; arson; and shootings. Terrorist targets are usually high value, high profile, high-visibility targets. Such targets may include: international airports; large cities; major special events; critical infrastructure; resorts; important landmarks; and political and/or business leaders. It is important to keep in mind that these are specific people, places, and targets, not regions.

A nuclear detonation is potentially the most destructive of any terrorist attack. The amount of destruction caused by a nuclear attack is determined by the size of the weapon. The effects of the fallout are determined by other factors, such as wind speed and weather conditions. “Dirty bombs” are not considered nuclear weapons and do not result in a nuclear explosion, but are one of the many forms of explosives used by terrorists.

Anthrax, as an example of bioterrorism, is an infectious disease that can be spread by inhaling, ingesting, or touching the spore-forming bacteria. As seen in the past, terrorists (either international or domestic) can use the U.S. Postal Service to spread anthrax. With the massive size of the Postal Service, this form of terrorism is extremely difficult to stop.

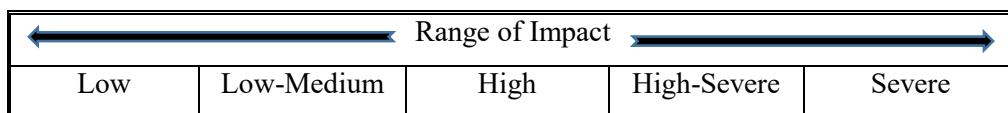
Other types of terrorism include:

- Agri-terrorism – The intentional contamination of food supplies or the introduction of pests and/or disease agents to crops and livestock.
- Cyberterrorism – This is terrorism that involves computers and networks along with the information they contain.

Range of Magnitude

TABLE 4.30

RANGE OF POTENTIAL CYBERTERRORISM IMPACTS BY ACTIVITY



Spoofting	False News	Identity Theft	System Blackmail (Extortion)	Overriding Systems Manipulation
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Past Occurrence

There have been no terrorist attacks in Perry County, to date.

Future Occurrence

Any act of agri-terrorism could prove harmful to Perry County’s economy and/or the health of many consumers. While the chance of being targeted remains low, the farming community recognizes the threat and has worked to put protections into place.

Cyberterrorism is becoming more of a concern, and is highly unpredictable. Every person, business, and government office with an internet connection opens themselves up to this threat. How that threat is dealt with determines the level of risk one faces.

Vulnerability Assessment

Since 47 percent of its land is agricultural, Perry County is susceptible to agri-terrorism. However, the likelihood of an attack is low. It is important to note that the use and exposure to these biological agents can remain unknown for several days, until the infected person(s), livestock, or crops begin to experience or demonstrate symptoms. Often, these agents are contagious and the infected person must be quarantined, livestock culled, and/or crops destroyed. The tables below show Perry County’s total number of farms and the total amount of cattle, chickens, and egg production.

TABLE 4.31

PERRY COUNTY FARMS, ACRES AND FARMS PER ACRE

Year	Acres	Acres Per Farm	Number of Farms
1995	115,500	147	785
1996	116,500	148	785
1997	123,500	152	815
1998	124,500	154	810
1999	126,000	159	790
2000	127,000	163	780
2001	127,500	167	765
2002	128,500	170	755
2003	128,500	170	755
2004	128,500	170	755

2005	128,500	170	755
2006	128,000	170	755

Source: USDA National Agricultural Statistics Service

TABLE 4.32

PERRY COUNTY CATTLE AND MILK PRODUCTION

Year	Cattle- All	Cattle- Milk	Year	Cattle- All	Cattle- Milk
1975	22,400 head		1992	25,200 head	
1976	22,100 head		1993	23,200 head	
1977	23,500 head		1994	22,500 head	
1978	22,500 head		1995	23,000 head	
1979	20,600 head		1996	24,000 head	
1980	21,800 head		1997	24,500 head	
1981	23,400 head		1998	24,000 head	
1982	25,300 head		1999	23,600 head	
1983	23,600 head		2000	24,600 head	
1984	23,000 head		2001	24,100 head	7,700 head
1985	23,300 head		2002	25,500 head	6,800 head
1986	23,800 head		2003	25,500 head	6,800 head
1987	23,000 head		2004	22,700 head	7,700 head
1988	21,900 head		2005	23,700 head	7,600 head
1989	22,000 head		2006	23,600 head	7,700 head
1990	21,700 head		2007	28,400 head	7,700 head
1991	23,700 head				

Source: USDA National Agriculture Statistics Service

TABLE 4.33

PERRY COUNTY CHICKEN AND EGG PRODUCTION

Year	Chicken Population	Egg Production	Year	Chicken Population	Egg Production
1978	236,000 Bird	49,285 thousand eggs	1987	251,000 Bird	67,238 thousand eggs
1979	240,000 Bird	46,505 thousand eggs	1988	251,000 Bird	66,258 thousand eggs
1980	225,000 Bird	47,209 thousand eggs	1989	270,000 Bird	68,162 thousand eggs
1981	180,000 Bird	39,405 thousand eggs	1990	350,000 Bird	79,424 thousand eggs
1982	180,000 Bird	41,469 thousand eggs	1991	335,500 Bird	90,406 thousand eggs
1983	230,000 Bird	54,184 thousand eggs	1992	312,000 Bird	84,809 thousand eggs

1984	226,000 Bird	49,545 thousand eggs	2000	247,900 Bird	69,000 thousand eggs
1985	200,000 Bird	50,974 thousand eggs	2001	222,500 Bird	73,000 thousand eggs
1986	280,000 Bird	58,347 thousand eggs	2002	205,100 Bird	72,000 thousand eggs

Source: USDA National Agricultural Statistics Service

Possible attacks on livestock are a concern, but approximately 69 percent of the farmland in Perry County is utilized as cropland. Cropland makes up more than 89,000 acres of the total 129,092 acres of farmland in Perry County. The top crops and uses include corn, soybeans, and wheat⁶

It is not likely Perry County will experience a direct attack by a terrorist organization. Perry County is more likely to experience the secondary effects of a nearby area being attacked; this would include the Susquehanna Steam Electric Station, located in Luzerne County and Three Mile Island, located in Dauphin County. However, the threat of a terrorist attack with chemical, biological, radiological, nuclear, or explosive (CBRNE) weapons is increasing. One method to assess the potential for a terrorist attack is by looking at the amount of critical infrastructure in the area. Facilities such as power plants and water facilities could disrupt a much larger area and are therefore more prone to terrorist attacks. Another way to gauge the threat of a terrorist attack is by reviewing law enforcement threat warnings and the U.S. Department of Homeland Security’s Threat Advisory System. This color-coded chart is an assessment of the current threat of a terrorist attack.



Probability

Terrorist events are unpredictable by nature. While significant improvements have been made in their detection and prevention, terrorist events remain challenging to predict in size, scope, intent, and frequency. Although the likelihood of an occurrence in Perry County or the surrounding area is extremely low, it is possible the County could experience the effects of a terrorist event. However, this is not likely within a period of 30 years or more.

Maximum Threat

The impact resulting from a terrorist event can vary from nominal to catastrophic, depending on the type, location, and severity of the event. The greatest impact would be to the health and safety of the citizens, the continuation of government operations, facilities, and critical infrastructure, and local economic stability.

While Perry County may not seem to be a conventional terrorism target, its rural areas are susceptible to agri-terrorism. The impact could be severe to the traditional family-operated farm,

⁶ USDA National Agricultural Statistics Service, 2002 Census of Agriculture County Profile, Montour, Pennsylvania.

low-density residential areas, commercial agriculture operations, resource production facilities, and small-scale operations.

Similarly, the areas along the major transportation routes, including U.S. Route 11/15, U.S. Routes 22/322 could be susceptible to some form of public transit terrorist attack. The more populated areas of the County would be susceptible to chemical, biological, nuclear, radiological, or explosive events, due to the concentration and density of residential communities.

There is also the chance that Perry County could be indirectly affected by an act of terrorism. Somerset County witnessed this first-hand, as United Flight 93 crashed into a field in Shanksville, Pennsylvania on September 11, 2001.

Secondary Effect

The resulting secondary effects from an act of terrorism are contingent on the type, location, and severity of an event. Nominal effects, similar to what Somerset County experienced in the wake of the Flight 93 tragedy, may be relatively minor compared to the impact on the populace, property, and surrounding environment. Emotional trauma, subsequent property damage, and the introduction of small amounts of hazardous materials into the environment are the likely secondary effects of a similar incident occurring in Perry County.

Secondary effects can also range to the catastrophic in impact and may be more damaging and have a greater lasting impact than the initial event. This may occur as the result of a chemical, biological, nuclear, radiological, or explosive event that directly or indirectly affects the County. Critical protective actions may be required of first responders or the entire population. Resulting mass evacuations could lead to traffic congestion and a breakdown in civil order, further exacerbating the situation. Government operations may be disrupted, due to the need to displace or operate under reduced capacity. The environment may experience damaging long-term effects from radiation fallout, chemical introduction into the ground water, or biologic/germ introduction into the ecosystem. Critical infrastructure may be irreparably damaged, and a loss in agriculture productivity could permanently affect the County's economy.

Transportation Accident (Air, Roadway, Rail, and Transit)

Location and Extent

Transportation accidents claim more lives annually and cause more injuries than any other hazard. With rail, air, and highway transportation available across the Commonwealth, every county is susceptible to transportation related hazards.

There are no public airports listed in Perry County by the PennDOT Bureau of Aviation. However, this does not exclude the possibility of an aviation accident in the County. Any private airports and flight paths through the County can still represent a potential for an aviation accident.

Perry County is serviced by two major highways: U.S. Route 22/322 which travels through the middle portion of the County, and U.S. Route 11/15, which runs eastern border of the County. Major connector routes within the County include State Routes 17, 34, 104, 233, 235, 274, 849, and 850.

Elsewhere, Perry County is served by two major rail lines: a National RR Passenger Corporation passenger, and commuter railroad and a Class 1 Norfolk Southern railway line.⁷

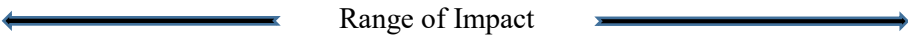
According to the South Central Pennsylvania Regional Goods Movement Study, approximately \$1.3 trillion in valued goods traveled through, to, or from the eight county region which includes Perry County. Due to its access to major markets in Baltimore, Pittsburgh, Philadelphia, New York City, and Washington D.C., many goods are staged in the South Central Pennsylvania region. This creates a large volume of truck traffic on the road infrastructure of many Pennsylvania counties, including Perry County.

According to the 2007 Perry County Comprehensive Plan, The Perry County Transportation Authority (PCTA) provides demand response shared-ride service to the general public. Transportation is provided to and from all points within the County and to certain destinations outside the County, including Carlisle, Harrisburg, and Hershey.

Range of Magnitude

TABLE 4.34

MAGNITUDE OF A TRANSPORTATION INCIDENT

Means of Transportation					
	Low	Low - Medium	Medium	High	Severe

⁷ ftp://ftp.dot.state.pa.us/public/pdf/BPR_pdf_files/MAPS/Statewide/parail.pdf

<p>Air (Airplane, Helicopter, Jet)</p>	<p>Emergency Landing</p>	<p>Emergency Landing with damage to the Airplane, Helicopter or Jet</p>	<p>Crash landing Injuries confined to those onboard</p>	<p>Crash with injuries and to those onboard and those on the ground</p>	<p>Crash with serious injuries and/or fatalities to those onboard and those on the ground</p>
<p>Land (Automotive: Car, Bus, SUV, Truck Tractor, Trailer, and Semi)</p>	<p>Any road or highway incident commonly referred to as a <i>minor fender bender</i></p>	<p>Any road or highway incident where the vehicle departs the roadway and causes property damage</p>	<p>Any road or highway incident causing injuries confined to those in the vehicle</p>	<p>Any road or highway incident causing injuries to individuals in multiple vehicles</p>	<p>Any road or highway incident resulting in fatalities</p>
<p>Land (Railroad Train/ Locomotive)</p>	<p>Any minor low speed railroad incident causing only minor damage to the train</p>	<p>Derailment where the Train departs the railroad and causes only property damage</p>	<p>Derailment causing injuries confined to those onboard</p>	<p>Derailment causing injuries to individuals in multiple vehicles</p>	<p>Derailment with serious injuries and/or fatalities to those onboard and those on the ground</p>
<p>Water (Boats, Floating Tubes Jet Ski, Kayaks and)</p>	<p>Damage to water transport vehicle from running aground and docking</p>	<p>Wreck causing damage to watercraft vehicle causing only property damage</p>	<p>Wreck with damage to watercraft causing injuries confined to those onboard</p>	<p>Wreck with serious damage to individuals onboard multiple watercraft</p>	<p>Wreck with serious damage to the boat, and injuries and/or fatalities to those onboard multiple boats</p>

Past Occurrence

Perry County, even without major airports, is not excluded from aviation accidents. However, the Federal Aviation Administration lists no crashes in Perry County since 1962.

Perry County averaged 569 automotive crashes per year between the years 2002-2006. The upcoming table illustrates Perry County’s crash statistics from 2002-2006. The most automotive crashes in the County occurred in 2003, when there were 609 recorded crash incidents. The

number of crashes within the County is well behind the state average for the time period between the years 1998-2003, as Pennsylvania averaged more than 2,000 crashes per county.

Deaths resulting from automotive crashes are relatively low in Perry County. In 2006, a peak of 18 deaths was related to automotive crash incidents. This again lagged behind the statewide average of 22 deaths per county related to automotive crashes. Recorded seatbelt usage in Perry County was recorded at a relatively high level. In 2006, 80 percent of all involved in automotive crashes were wearing a seatbelt. The statewide average was 73 percent in 2006.

Since 2000 there have been a couple of railroad incidents. One involved a derailment, there was a railroad crossing impact with a vehicle and an individual struck and killed while trespassing on the rail line.

TABLE 4.35
AUTOMOTIVE-RELATED ACCIDENTS

Category	Year				
	2013	2014	2015	2016	2017
Total County Crashes	508	498	463	463	486
Statewide County Crash Average	1,852.97	1,810.70	1,897.42	1,931.27	1,913.25
Total County Fatal Crashes	9	7	11	11	8
Statewide County Average Fatal Crashes	5.69	4.97	5.15	4.43	4.37
Total County Alcohol-Related Crash Fatalities	7	0	1	0	5
Statewide County Average of Alcohol-Related Crash Fatalities	5.69	4.97	5.15	4.43	4.37
Seatbelt Usage Average Percentage	84%	84%	87%	86%	89%
Statewide County Average Seatbelt Usage	78%	79%	80%	80%	80%
Pedestrian Fatalities	0	0	1	2	1
Statewide Average Pedestrian Fatalities	2.25	2.48	2.28	2.57	2.24

Source: Pennsylvania Department of Transportation, 2017 Pennsylvania Crash Facts and Statistics, Pennsylvania County Crashes

No major public transportation accidents or terrorist attacks have occurred in Perry County. Similarly, Perry County has no recorded pipeline breaks. The National Response Center lists 24 hazardous materials instances occurring in Perry County between December 1990 and January 2008.

Future Occurrence

As long as there is travel for any purpose, there will continue to be transportation incidents. The slowly calculated integration of autonomous travel and transport ideally could reduce the number of incidents caused by human error. Not to be overlooked, the maintenance of autonomous vehicles will be just as critical as with any vehicle in use today, in order to minimize the risk of mechanical failures leading to such incidents.

Vulnerability Assessment

Perry County's vulnerability to an aviation accident is relatively low because there are no public airports in the County.

The vulnerability of a rail, transit, or personal automobile accident is directly related to the population and the traffic density of the area. In Perry County, U.S. Routes 22/322 and 11/15 present the greatest threat of an automotive or transit accident, as this major highway is traveled by local commuters and long distance travelers. Connector roads to U.S. Routes 22/322 and 11/15 also see greater traffic volumes and present higher vulnerability to transportation accidents.

According to the South Central Pennsylvania Goods Movement Study, the eight county Central Pennsylvania Region, including Perry County, is projected to see an annual increase of 2.2 percent in truck tonnage and 1.6 percent in rail tonnage through the year 2030. Further, the percentage of truck trips through the region is projected to increase 2.1 percent between 2003 and 2030. These projections will also bring about roadway congestion, safety concerns, shortage of proper parking areas, and other issues that can affect transportation incidents.

Perry County's vulnerability to pipeline incidents generally depend on the secondary effects of other hazards including, but not limited to flooding, earthquakes, landslides, and severe weather.

Given the location of Perry County, it is unlikely a terrorist attack would occur on the County's public transportation system. However, mass transit accidents on highways or secondary roads have a high probability of injuring many citizens.

With rail a derailment in Duncannon, Newport or Duncannon could have tragic results. Bakken oil tankers referred to by then Harrisburg City Councilman Brad Kaplinski as "bomb cars" travel through these communities.

Probability

The probability of a transportation accident occurring in Perry County is high. However, the probability of a major transportation accident (other than a routine transportation accident) is low. Automobile accidents, both minor and fatal, will occur more frequently than a pipeline incident or a significant mass transit accident. Roadway accidents occur annually, often with limited impact.

Maximum Threat

The maximum transportation-related threat to Perry County is when the incident occurs in or near a heavily populated area. Each mode of public transit experiences accidents on an annual basis. Each of these incidents can occur on both small and large scales, depending on the number of vehicles involved.

Automobile accidents can occur on any roadway. Typically, the higher speeds and more heavily traveled roads, such as U.S. Routes 22/322 and 11/15, experience a higher percentage of Perry County's automobile accidents. These traffic accidents are most common during periods of inclement weather.

Rail accidents are not very common, but can occur anywhere along a rail line.

Secondary Effect

Hazardous material spills are the most common secondary effect of transportation accidents. Fires (both urban and rural) and utility failures can also occur.

Sources

Pennsylvania Department of Transportation, 2017 Pennsylvania Crash Facts and Statistics, Pennsylvania County Crashes

Urban Fire and Explosion

Location and Extent

The U.S. Fire Administration (USFA) collects data from a variety of sources to provide a statistical analysis of fire incidents nationwide. According to the USFA, the number of fires, fire casualties, and economic losses has continued to decline over the last several years. From 1992-2001, fires per million population declined 204 percent, deaths per million declined 30 percent, and dollar loss per capita declined 6 percent. This data is confirmed by comparing it with the National Fire Protection Administration's (NFPA) data on national fire trends from 1977-2004. The NFPA data shows that in 1977, there were a total of 3,264,000 fires nationwide, resulting in 7,395 civilian deaths and 31,190 civilian injuries. In 2004, this number dropped to a total of 1,550,500 fires, 3,900 civilian deaths, and 17,785 civilian injuries nationwide. A 2001 study by the USFA showed the largest number of fires were classified as "outside/other" and accounted for 41 percent of all fires, while residential fires resulted in the highest percentage of fire deaths (77%), fire injuries (73%), and dollar loss (54%). Non-residential properties, such as industrial and commercial establishments, institutions, and educational facilities, accounted for only 8 percent of all fires, but 28 percent of total dollar loss.

From 1992-2001, Pennsylvania had an average fire death rate above the national average, with an average between 11-17 per million population. This is due primarily to the state's high population density. In 2001, Pennsylvania averaged 3.01 civilian deaths per 1000 fires and \$22,609 in property loss per fire. In 2003, the USFA recorded a fire death rate of 15.9 per million for Pennsylvania. This was above the 2003 national average of 14.4 per million and ranked the Commonwealth as the 15th highest state that year.

All fires can broadly be categorized as either wildfire or urban fire. Both categories have been responsible for some of the nation's largest, deadliest, and most destructive disasters.

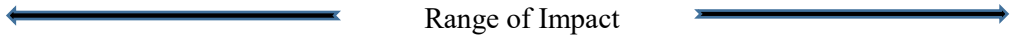
Perry County participates in the PennFIRS reporting program with the Office of the State Fire Commissioner. PennFIRS provides a statewide fire information and reporting system. The Office of the State Fire Commissioner is working with county agencies to encourage them to participate in PennFIRS as first level data collections sites to assure that this statewide data network works as smoothly and efficiently as possible. While there is no requirement that county EMA or 911 agencies get involved in the PennFIRS program, the valuable information available through PennFIRS can be beneficial and become an important resource.

The term "urban fires" generally refers to any fire involving structures, whether residential or commercial, and should not be deemed to mean only fires in a city (urban) setting. Although urban fires can start from numerous causes, major fires are often the result of other hazards such as storms, droughts, transportation accidents, hazardous material spills, criminal activity (arson), or terrorism. Small structural fires occur often and will not have a large impact on an area, but will increase insurance rates.

Range of Magnitude

TABLE 4.36

SEVERITY OF AN URBAN FIRE WITH OR WITHOUT AN EXPLOSION

 Range of Impact				
Low	Low - Medium	Medium	High	Severe
Single-family dwelling unit and/or explosion suppressed and kept onsite	Multi-family dwelling unit, and/or explosion suppressed and kept onsite	Fire extends to adjoining properties and multiple dwelling units	Business or mixed use building impacted by fire and/or explosion	Fire or explosion attributed to the loss of life

Past Occurrence

Between 1910-1990, Pennsylvania experienced 13 major fires in suburban and urban settings. Of the 13 fires, 10 occurred between 1980-1990. Between 1978-1982, the average number of deaths per fire was 2.7. Each year, the average number of deaths per fire has decreased (as of October 1990).

Future Occurrence

Building proximity, the existence of regularly maintained fire alarms, fire suppression devices and equipment, and emergency fire response time are all critical in determining the outcome of an urban fire in our borough and village centers. It is in these locations where the greatest risk exists for the spread of fire to adjoining properties and receive impacts from and explosion.

Presently there are no residential or business servicing gas lines other than those in Perry County. There are however, buildings with LP tanks are individually susceptible to explosion

Vulnerability Assessment

The vulnerability for a fire greatly depends on the vulnerability of other hazards. As mentioned above, most fires result from the secondary effect of another hazard. The probability of a fire occurring has increased with population growth. This is due to human error and carelessness, which are other factors contributing to urban fires. This risk also increases as the use of wood burning and kerosene space heaters increases. The elderly (65 and older) tend to be more vulnerable to fires than any other age group. They also experience the highest number of deaths per fire. The second most vulnerable age group is those who are aged 14 and younger. These groups are generally affected while they are at home. And in the case of children, they may often be home alone. Additionally, many homes destroyed by urban fires are often the older homes in the community. Fire can spread faster in areas with higher concentrations of housing, as opposed to rural areas. The potential secondary effects of an urban fire include utilities failure and hazardous materials spill.

As with all fires, the response time of emergency personnel can greatly mitigate the effects of a fire. This is particularly critical in urban fires, due to the potential for loss of life and property. The USFA defines “response time” as beginning at the moment of ignition and continuing until the fire is extinguished. A January 2006 report by the USFA’s National Fire Data Center shows that regardless of region, season, or time of day, structure fire response times are generally less than five minutes 50 percent of the time, less than six minutes 61 percent of the time, and less than eight minutes 75 percent of the time. On average, 98.7 percent of all response times are 20 minutes or less nationwide, with the 90th percentile of response times to structure fires less than 11 minutes. It is important to note, however, that as population densities increase, fire stations are situated to cover less geographic area, which may ultimately contribute to reduced response times.

Probability

The probability of an urban fire occurring in Perry County is relatively high; however, the impacts of the fire depend greatly on its location and magnitude. Most urban fires are quickly contained and cause only localized damage, due to the proximity and rapid response time of emergency services personnel. With Perry County having a high frequency of drought declarations, the potential exists for lightning or human carelessness to start fires.

Maximum Threat

Urban fires often occur in heavily populated and developed areas. The majority of all urban fires affect only a few structures before being contained. However, the greatest risk is the potential of an urban fire to spread from one structure to another faster than local emergency services can provide the resources to control it. For this reason, the more densely developed areas of Marysville, Duncannon, Bloomfield, and New Buffalo Boroughs, especially where older homes and businesses are clustered, are at greatest risk.

Secondary Effects

If an urban fire is not contained, certain secondary hazards may affect Perry County. Power outages may be the most prevalent of these hazards.

Health hazards could also result from a wildfire or urban fire. The potential for brief periods of airborne ash, smoke, or soot to cause long-term health problems raises concerns among segments of the County’s population who have pulmonary problems, heart disease, or breathing problems. The release of hazardous materials caused by a fire could cause a public health emergency.

Urban fires can damage infrastructure and property. Temporary population displacements could occur as the result of large fires, and the economic impact from widespread fires which affect critical infrastructure, vital economic industries, or private residences could be high.

Utility Interruption

Location and Extent

Utility failures are a common secondary effect of many hazards, such as severe weather, landslides, hazardous material spills, and transportation accidents, to name a few. While they are common, they can present serious consequences with certain weather characteristics, such as severe cold weather. Below is a general description of the utility services in Perry County.

*Electric*⁸

Electric services are provided to Perry County through the Pennsylvania Electric Company and PPL Electric Utilities Corporation.

*Water/Sewer*⁹

There are nine public water systems in Perry County that serve approximately 35 percent of the total County population. The rest are served by individual wells, springs, or cisterns.¹⁰

Perry County’s public sewage is maintained by 10 municipal sewer authorities. These authorities administer the sewage systems within the County as well as 11 treatment plants.

*Gas*¹¹

Natural gas distribution lines do not exist within Perry County. However, the Buckeye, Allegheny, Texas Eastern, Mobile and Laurel natural gas pipelines do pass through the County.

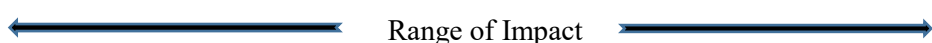
*Communications*¹²

MCI Worldcom Network Service Inc., AT&T Communications of Pennsylvania, Inc., and United Telephone Company of Pennsylvania provide communications access to Perry County.

Range of Magnitude

TABLE 4.37

MAGNITUDE OF A UTILITY INTERRUPTIONS

Utility Type				
	Low	Medium	High	Severe

⁸ Perry County Comprehensive Plan Basic Studies (2015)

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

Communications	System software maintenance and interruptions	Temporary, cell phone tower and/or wifi signal outage	Widespread long-lasting regional blackout	Widespread long-lasting regional blackout, emergency communications and alerts not transmitted
Electric	Brief power failure or surge	Short-term power outage, confined to a small sub-region of the county	Widespread long-lasting regional blackout threatens individuals at risk, dependent on electricity to operate equipment	Widespread long-lasting regional blackout causes a fatality due to dependent need for electricity to operate equipment
Water/Sewer	Brief loss of water/sewer pressure for	Partial water/sewer system offline for extended period of time	Partial water/sewer system offline for extended period of time	Complete water/sewer system offline for extended period of time

Past Occurrence

While this information is not well documented, it is commonly known that utility failures occur often. Future documentation of these instances may provide an opportunity for Perry County to mitigate such service outages.

Future Occurrence

In recent years, the electric grid has been the focus of many improvements. The effort has been to improve redundancy in the electricity network to prevent against long-term interruption. This work should help to provide more resiliency to the system.

In terms of water and sewer, our climate’s seasonal weather patterns, the overall engineering design, and the integrity of materials are all factors in a localized break.

With communications, our reliance on receiving current and up-to-date information is constantly increasing. Interruptions to the communications systems will likely continue. The frequency of these interruptions will be based upon a number of factors not the least of which is the age of infrastructure.

Vulnerability Assessment

Electric

Electrical failures are commonly a secondary effect of hazards such as severe weather and flooding. High winds, along with heavy snow, ice, and rain, can affect an electrical system’s

ability to function. Worker strikes have also been known to cause minor power failures. Other causes of power outages include falling tree limbs, vehicular accidents, and small animals that destroy wiring. When power outages occur, they are typically on a regional scale. According to the 2000 census data, 21.8 percent of Perry County households utilize electricity as their heating source. Additionally, 56.6 percent use fuel oil to heat their homes. In an extended power outage, these residents would have a difficult time efficiently heating their homes.

Water

Contamination of the water supply can occur naturally, as a result of human error, or intentionally. Occasionally, the release of manure or other farming byproducts can contaminate water. Accidents resulting in hazardous material spills can also adversely affect groundwater.

Perry County's water supply includes springs, streams, rivers, reservoirs, treatment plants, and pumping stations. Water distribution can be affected by: the amount of water available, the quality of water available, and the viability of the physical components of the distribution systems. The quantity of water depends on natural conditions, such as drought. Human action can affect the maintenance of water quality. Terrorism is a potential threat to water quality. Some terrorist organizations have stated a desire to infect the water supply or damage associated infrastructure. U.S. intelligence has stated this would be difficult to achieve, due to the amount of chemicals needed to contaminate the water supply.

Gas

According to the 2000 U.S. Census, less than one percent of Perry County houses use gas as a source of heat. With limited gas users in Perry County, the effects of a gas shortage would probably be minimal. However, gas has the potential to ignite, explode, or release toxic fumes. According to the American Gas Association, there are more than 2.6 million natural gas consumers in Pennsylvania¹³. A shortage of natural gas would not allow these residential, commercial, and industrial customers to efficiently heat their structures.

Communications

While Perry County residents receive their communication services from a range of service providers, they are still vulnerable to outages. Small-scale failures occur annually.

Probability

The probability of a large-scale, extended utility failure is low. However, small-scale failures lasting short periods of time occur annually.

Maximum Threat

Utility failure poses a maximum threat to the special needs population in Perry County. Resources such as electricity, communications, gas, and water supply are critical to ensure the

¹³ American Gas Association – www.aga.org

health, safety, and general welfare of the citizenry. The special needs population can be vulnerable to loss of heat or air conditioning during extreme weather months. The County must account for its special needs population during times of extended utility failure.

Secondary Effects

The potential secondary effect of a loss of communications and water is an inadequate emergency response. Efficient and effective communications and adequate portable water supply are critical resources for first responders. A loss of electricity and gas can also have a negative impact on first responders. However, the most critical secondary effect would be the loss of heating compounded by periods of severe cold. The health and safety of at-risk populations in the affected area, such as the elderly, could be adversely affected by a loss of heat or air conditioning that results from a utilities failure.

EARTHQUAKE

Location and Extent

Earthquakes are very rare in Pennsylvania and have caused little damage, with no reported injuries or casualties. Earthquakes that do occur in Pennsylvania happen deep within the earth’s crust. This is because the Commonwealth does not lie on an active fault. In most cases, these earthquakes are non-measurable events. Nonetheless, earthquake standards are a valuable consideration when determining building codes. The Richter Scale below describes the magnitude of earthquakes.

Range of Magnitude

TABLE 4.38

THE RICHTER SCALE

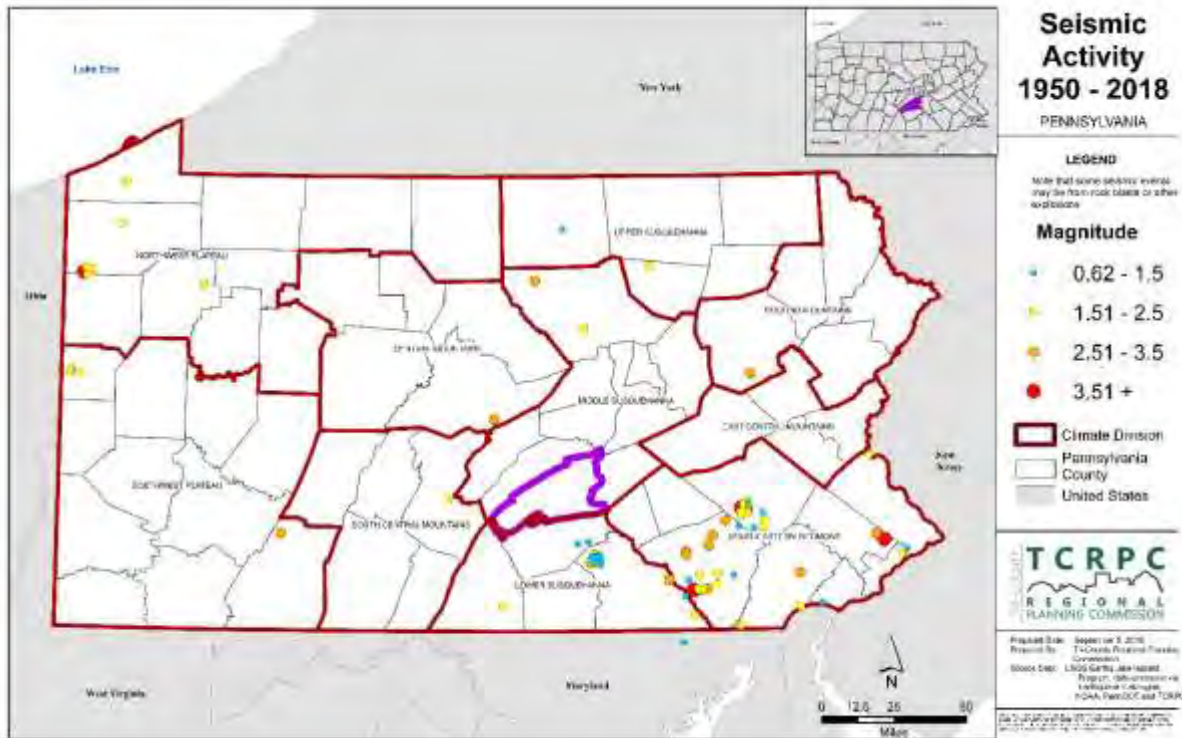
Descriptor	Richter Magnitude	Earthquake Effects	Worldwide Annual Average
Micro	Less than 2.0	Microearthquakes, not felt.	About 8,000/day
Very Minor	2.0-2.9	Generally not felt, but recorded.	About 1,000/day
Minor	3.0-3.9	Often felt, but rarely cause damage	49,000 (estimated)
Light	4.0-4.9	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 (estimated)
Moderate	5.0-5.9	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.	800
Strong	6.0-6.9	Can be destructive in areas up to about 100 miles across in populated areas.	120
Major	7.0-7.9	Can cause serious damage over larger areas.	18
Great	8.0 or greater	Can cause serious damage in areas several hundred miles across	1

Source: U.S. Geological Survey (USGS)

Past Occurrence

No significant earthquakes have been recorded in Perry County. Parts of southeastern Pennsylvania, such as Lebanon and Berks Counties, have experienced minor earthquakes with minimal damage.

MAP 4.8



Future Occurrence

Pennsylvania as a whole may experience a greater number of earthquakes in the future with all the fracking activity conducted with the Marcellus and Utica Shale gas plays. While it is unknown if fracking itself or the fluids from fracking has or will lead to such seismic events, explosives are used and through this process voids in the rock strata are created. It is within these voids porous material is added to introduce a new composition to the geology.

A 2018 study titled, *Maturity of nearby faults influences seismic hazard from hydraulic fracturing* provides reasonable arguments to suggest a dynamic connection might exist. Presently, Perry County does not have any conventional or unconventional wells from either gas play. Seismic waves generated by earthquakes, do not terminate at political boundaries. Even when the epicenter of a quake occurs outside the county, the energy transfer through our underlying geology can still be felt here.

Vulnerability Assessment

As of today, Perry County has a low vulnerability to earthquakes. In fact, no significant earthquakes have been documented in County history.

Probability

The probability of an earthquake affecting Perry County is extremely low, with a probability of occurrence once every 30 years or less. While Perry County does not lie on a major fault line, it is still possible the County could experience minor, unrecorded quakes with minimal to no damage.

Maximum Threat

Because Perry County does not rest on a major fault, no single area is at greater risk of an earthquake than another.

Secondary Effects

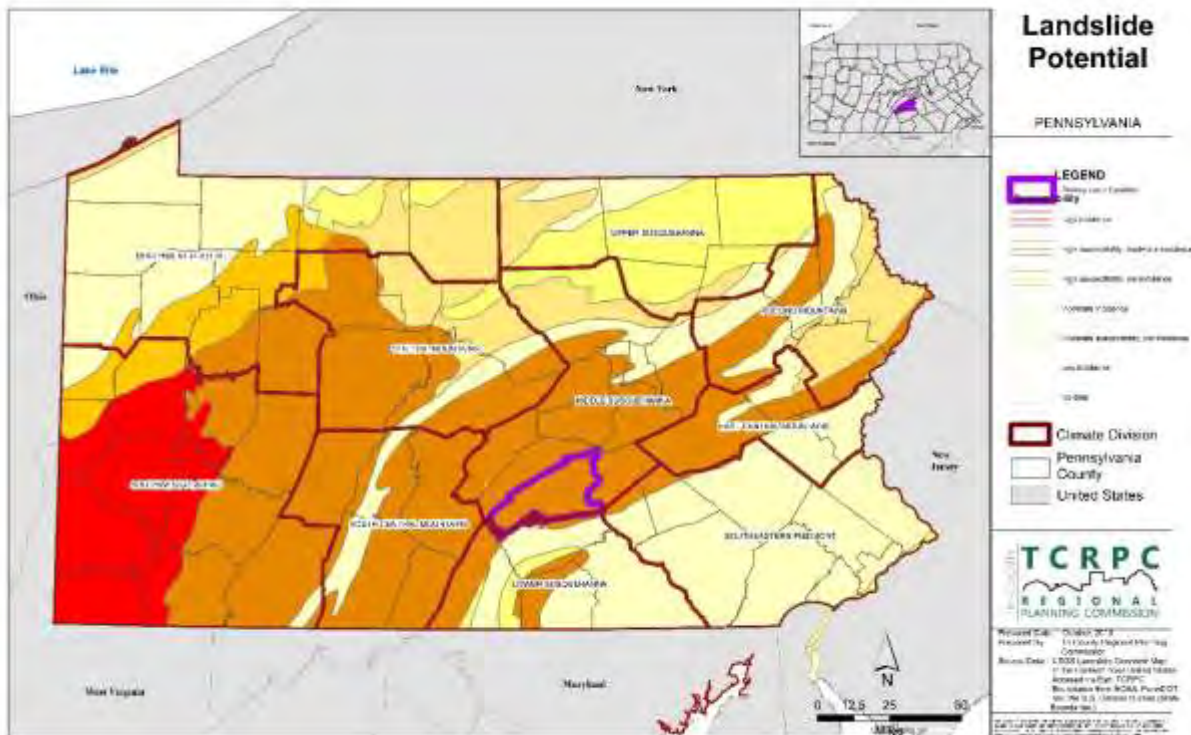
The secondary effects of an earthquake can range from nominal to severe, based on its location and magnitude. Even minor quakes have the potential to cause power outages, hazardous material spills, dam failures, traffic accidents, and landslides. The economic impact from widespread structural damage to property, facilities, and infrastructure can also be severe. The health and safety of citizens and essential personnel in the affected area can be adversely affected. A limited disruption of critical government services may occur.

Landslides and Rock Fall

Location and Extent

Landslides and rock fall are a natural movement of the earth down a slope. While there have been no recorded deaths or injuries from landslides in Pennsylvania, this does not mean they cannot occur. The worst damage caused by landslides and rock fall usually affects utilities, pipelines, roadways, and buildings.

MAP 4.9



Range of Magnitude

TABLE 4.39

SEVERITY OF LANDSLIDE OR ROCK FALL

<div style="display: flex; justify-content: space-between; align-items: center;"> ← Range of Impact → </div>				
Low	Low - Medium	Medium	High	Severe

Land slump or creep when the top layer of soil begins to creep	Landslide or rock fall causes change to the visible landscape	Landslide or rock fall creates a travel impediment	Landslide or rock fall resulting in injury and/or damage to property	Landslide or rock fall resulting in loss of life
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Past Occurrence

Landslide and rock fall history is not as well documented as other hazards, primarily because landslides are not always seen. Landslides and rock fall have occurred all over Pennsylvania and have caused minor to major damage. While no significant landslides or rock fall have been documented in Perry County, landslides and rock fall are a considerable geologic hazard that can occur in any area under specific local conditions. The Pennsylvania Department of Transportation has in prior years estimated it had spent \$10 million annually on repair contracts for roadways damaged by landslides and rock fall throughout the Commonwealth.



Image provided by the TCRPC (Image date: April 20, 2019)

Future Occurrence

Mitigation activities along the US Traffic Routes 11/15 corridor near Liverpool, Duncannon, Marysville, and Newport should significantly reduce potential impacts from rock fall. Loose rock was removed Mesh fencing has been applied to the landscape to hold rock back. There are many other locations on secondary and local roads that will eventually need to be inventoried. This additional step will continue the process of helping to reduce the traveling public's vulnerability to this hazard.

Vulnerability Assessment

The total number of landslides and rock fall and their damage in Pennsylvania is unknown. Reporting of landslides varies widely from county to county. Landslides are most often seen in Allegheny, Armstrong, Beaver, Tioga, and Washington Counties. Most landslides and rock fall occur as a result of heavy precipitation. Also contributing to this is the removal of vegetation, changing the slope of a hillside, and earthquakes. Perry County has a low level of landslide and rock fall incidents.

Probability

There is a relatively low probability that a landslide will significantly affect Perry County. History shows a frequency of occurrence once every 30 years or less. While susceptibility and probability may be low in Perry County, minor landslides resulting in little to no damage may occur more frequently.

Maximum Threat

Although unlikely in Perry County, landslides and rock fall are most likely to occur along high-volume traffic areas, especially where the road travels through a cut in the topography.

Secondary Effects

Similar to earthquakes, the secondary effects from a landslide or rock fall can include traffic disruptions and accidents. These events can also lead to power outages and hazardous material spills.

Radon

Location and Extent

Radon is a naturally occurring, colorless, odorless, inert, radioactive gas. It forms as a product of the natural decay of uranium. Radon and its radioactive products are dangerous to health. Alpha particles are a probable cause of lung cancer. Studies done in Pennsylvania since 1984 show that indoor radon levels are dependent on the radon-emanation properties of soil and rock which a home is built. The table below, completed by the Pennsylvania Department of Environmental Protection (DEP), Bureau of Radon Protections, suggests guidelines to reduce radon exposure levels to 0.02 Working Levels (WL) or less. Conversions from WL to pCi/L are usually approximate. A level of 0.02 WL is usually equal to about 4 pCi/L in a typical home.

Range of Magnitude

TABLE 4.40

PADEP RADON GUIDANCE

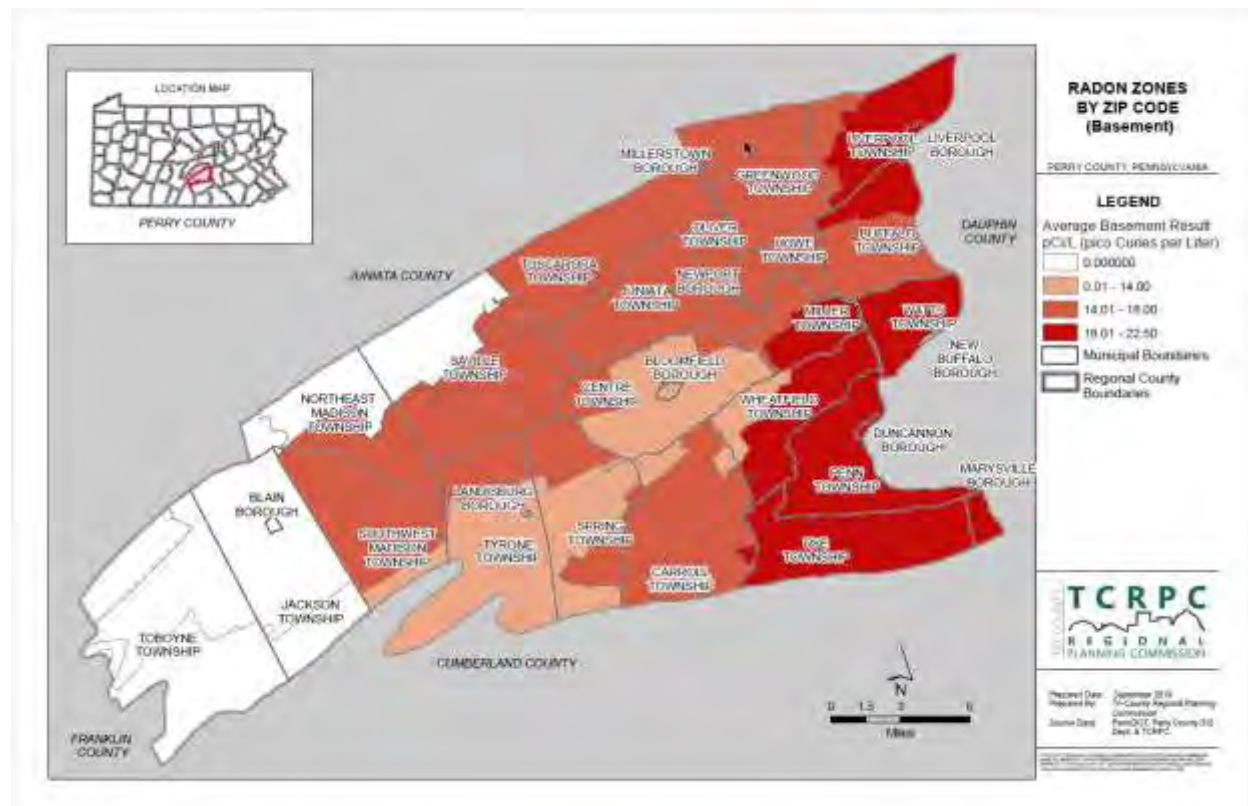
If your home measures*	Suggested Action**	Time Frame for Plan
more than 5.0 WL	Residents should either promptly relocate or undertake temporary remedial action to lower levels as far below 5.0 WL as possible. Smoking in high areas discouraged.	Within 2-3 days
1.0 to 5.0 WL	Residents should undertake temporary remedial action to lower levels as far below 1.0 WL as possible. Smoking in high areas discouraged.	Within 1 week
0.5 to 1.0 WL	Residents should undertake temporary remedial action to lower levels as far below 0.5 WL as possible.	Within 2 weeks
0.1 to 0.5 WL	Residents should undertake temporary remedial action to lower levels as far below 0.1 WL as possible. Higher exposure levels require action to be taken in a shorter period of time.	3 weeks to 3 months
0.02 to 0.1 WL	Residents should undertake temporary and/or permanent remedial action to lower levels below 0.02 WL. Higher exposure levels require action to be taken in a shorter period of time.	4 to 15 months
* Assumes continuous 24-hour exposure in living area.		
** Home testing should be conducted at the end of the indicated time frame to determine if remedial action has reduced the radon daughter exposure levels below the indicated value. If remedial action has not been successful, residents should be aware of the risks associated with continuous exposure at the indicated levels.		

Source: Pennsylvania Department of Environmental Protection

Past Occurrence

In 1984, the Pennsylvania Radon Bureau responded to the highest level of Radon daughter levels ever reported in the Commonwealth with a massive radon monitoring, educational, and remediation effort. As of November 1986, over 18,000 homes had been screened for radon and approximately 59 percent were found to have radon daughter levels in excess of 0.02 Working Level guidelines. Radon daughter levels (concentration of decay products of radon in the uranium chain) ranged up to 13 Working Levels (WL) or 2600 pCi/L (pico Curies per liter) of radon gas. While individual instances of radon are not well documented, no individual location can be assumed safe unless proven so by testing.

MAP 4.10



Future Occurrence

Unknown and unmitigated radon will continue to prey upon the health of our residents. Radon testing in the western end of the county has been lacking, and greater numbers are needed to improve records for establishing averages legitimate sub-regional data. Individual testing still needs to continue especially in the westernmost area. Awareness, education and economically affordable mitigation options are all essential for beginning steps to remediate this hazard.

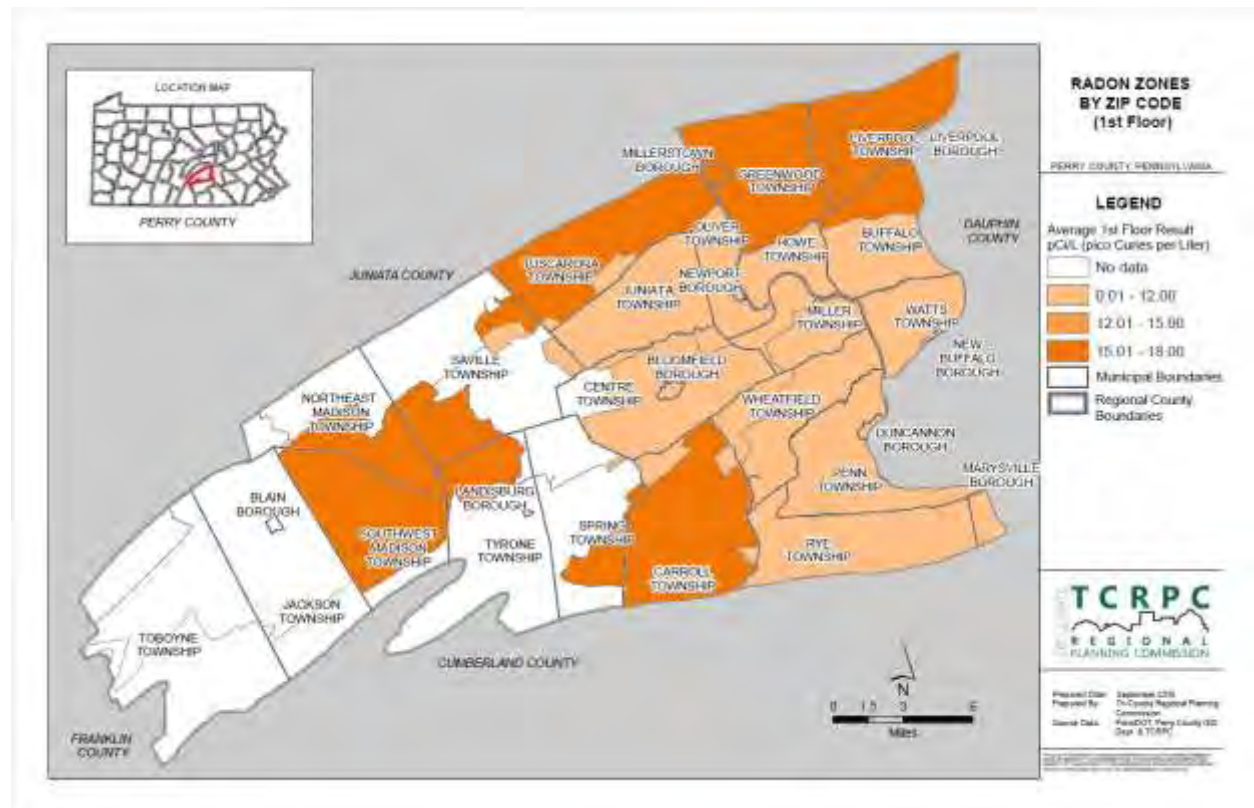
Our aging dwellings that are the most susceptible. As their foundations age they crack, establishing gateways for lethal radon gas. Without knowing, many homeowners exacerbate the problem when they improve the efficiency of their dwelling with new windows, trapping the gas inside without any ventilation of their basement. New construction is held to a high standard

these days through the Uniform Construction Code. Even still, in time these buildings will also need additional attention to mitigate against radon.

Vulnerability Assessment

The following map illustrates the average radon levels for the zip codes of Perry County, measured by the Pennsylvania Department of Environmental Protection. The EPA recommends that homeowners take action to reduce their home indoor radon levels if their home’s test is 4pCi/L (pico Curies per liter) or higher.

MAP 4.11



Probability

There is a high probability for radon emission in Perry County. No area should be assumed safe until tests have proven so. The EPA recommends homeowners take action to reduce their home indoor radon levels if their home’s test is 4 pCi/L (pico Curies per liter) or higher.

Maximum Threat

All Perry County municipalities, except for the Ickesburg zip code area of 17037 are at risk for radon gas emission with average results greater than 4.0 pCi/L. Only areas that have been tested and found safe can be assumed to not be susceptible to the effects of radon gas emission.

Secondary Effects

Radon often goes undetected and unnoticed because it is colorless and odorless, and many homes have never undergone testing. Because of this, the secondary effects are more difficult to identify and track. However, radon is known to have adverse short- and long-term effects on the health and safety of persons affected, and is widely believed to be a probable cause of lung cancer.

Land Subsidence and Sinkholes

Location and Extent

Subsidence is caused by the removal of ground water or other resources from the ground. Sinkholes are a natural hazard caused by erosion underground. The difference between subsidence and sinkholes is that subsidence is a manmade hazard, while sinkholes are naturally occurring. The United State Geological Survey states that sinkholes are a characteristic of karst topography that results from dissolution and collapse of carbonate rock, such as limestone and dolomite. It is characterized by closed depressions or sinkholes, caves, and underground drainage.

MAP 4.12



Range of Magnitude

TABLE 4.41

SEVERITY OF LAND SUBSIDENCE AND SINKHOLES

Low	Medium	Severe
Ground Depression perhaps needing fill to stabilize	Road or parking area effected by one or more pot holes	Sinkhole effects one or more buildings or structures

Past Occurrence

Sinkholes are a problem throughout Pennsylvania. The United States Geological Survey states that sinkholes have been most dangerous and frequent in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. While the U.S. Geological Survey has no recorded sinkholes in Perry County, this does not mean one does not exist. Perry County's volumes of limestone rock make it susceptible to sinkholes.

Future Occurrence

There are no predicted areas of concern for sinkhole activity. The presence of limestone geology alone does not necessarily mean the county will see sinkholes. The prior county map displays a significant amount of underlying geology with limestone composition suggesting that the county would likely see sinkhole development. The question is to what degree. This will be dependent on the composition of the limestone, the depth to this geologic layer, the depth of the geologic layer itself, and whether water is able to get to the layer in order to dissolve,

Vulnerability Assessment

Subsidence and sinkholes strongly correlate to the distribution of carbonic rock. However, not all areas underlain by carbonate bedrock, such as limestone, are at risk. According to the PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey, no sinkholes exist in Perry County. Yet, because of the limestone rock formations located in Perry County, there is still the possibility that subsidence or a sinkhole could occur.

Drought

Location and Extent

Drought can be broadly defined as a time period of prolonged dryness that contributes to the depletion of ground and surface water. There are three types:

Meteorological Drought – a deficiency in moisture in the atmosphere. This will have very little effect on the crops and water supply, depending on the preceding conditions.

Agricultural Drought – inhibits the growth of crops, because of a moisture deficiency in the soil. This type of drought, if persistent, can lead to a hydrologic drought.

Hydrologic Drought – a prolonged period of time without rainfall that can have adverse effects on agriculture, streams, lakes, and groundwater levels.

Leaving areas with little moisture, droughts are often one of the leading contributing factors to wildfires.

The effects of drought are:

- a depletion of consumable water supply
- a depletion of agricultural water supply
- a depletion of forest water and water used to fight forest fires
- a depletion of water for navigational and recreational purposes
- a depletion of water for natural irrigation (besides crops and forests)
- poor water quality

Droughts can have adverse effects on farms and other water-dependent industries. This can result in a local economic loss. From a citizen perspective, public safety is an issue in terms of consumable water not being available, as well as water for fire protection and emergency services.

Drought preparation includes three phases: drought watch, drought warning, and drought emergency.

Range of Magnitude

**TABLE 4.42
DROUGHT SEVERITY**

Watch	Warning	Emergency
Conditions favorable for an eventual drought	Drought has arrived and is effecting crops and water systems	Agricultural crops ruined; municipal water systems becoming depleted; individual wells run dry

Past Occurrence

Since 1980 Perry County has had nine drought emergencies according to the PADEP. Data collected from several disparate sources shows that Perry County has experienced several periods of drought conditions over the last few decades. The Pennsylvania Emergency Management Agency (PEMA) maintains data on all state and federally declared disasters affecting the Commonwealth. A review of PEMA’s disaster history indicates that Perry County has experienced two declared drought events from 1963 to 2002. While both droughts required a gubernatorial proclamation of a state of disaster emergency, the drought of 1999 was the most severe, resulting in an agricultural disaster which affected all 67 counties of the Commonwealth.

**TABLE 4.43
PERRY COUNTY DROUGHT EVENT HISTORY**

Date	Type	Affected Area	Action
July 1999	Drought	Adams, Allegheny, Beaver, Bedford, Berks, Blair, Bradford, Bucks, Cambria, Cameron, Carbon, Centre, Chester, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Delaware, Fayette, Franklin, Fulton, Greene, Huntingdon, Indiana, Perry, Lackawanna, Lancaster, Lawrence, Lebanon, Lehigh, Luzerne, Lycoming, Perry, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Washington, Wayne, Westmoreland, Wyoming, and York	Governor's Proclamation, Individual Assistance, Hazard Mitigation Grant Program - Amended to include all 67 counties for an agricultural disaster
July 1991	Drought	Adams, Bedford, Blair, Bradford, Cambria, Cameron, Carbon, Centre, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Perry, Lackawanna, Lancaster, Lebanon, Luzerne, Lycoming, Perry, Monroe,	Governor's Proclamation

	Montour, Northumberland, Perry, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Wayne, Wyoming, and York	
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Source: Pennsylvania Emergency Management Agency (PEMA)

A further examination of drought data obtained from the National Climatic Data Center (NCDC) between January 1, 1950 and December 29, 2005 shows that Perry County experienced six recorded drought events and one period of unseasonably dry weather. While this data differs slightly from records maintained by PEMA, there is some correlation, specifically in relation to the droughts of July 1999 and September of 1995. While the PEMA data more accurately reflects *declared* drought disasters in the Commonwealth, the NCDC data provides an indication of the *impact* these events had on the County relative to residents, property, and local economic vitality. While none of these events resulted in injury or loss of life to County residents, or caused significant property damage to any County structures, the drought of July 1999 did result in an estimated \$500 million in crop damage among 35 affected counties in the Commonwealth, including Perry.

The data obtained by the NCDC also provides a more detailed understanding of the existing weather conditions and impact to Perry County for the seven recorded events.

The drought of 1995 started in August with a one-month period of drought conditions for several Commonwealth counties, including Perry. Unseasonably dry weather continued into September 1995, with two consecutive months of below-normal precipitation, and culminated in one of the driest springs on record for the Poconos and the Middle Susquehanna Valley. In September 1995, the drought continued unabated throughout eastern Pennsylvania for the first half of September. Rainfall was closer to normal during the second half of the month; however, most counties had about 75 percent of their normal rainfall. The rain came too late to help farmers and by the end of the month, most of eastern Pennsylvania was under a drought emergency.

Harrisburg set a record for the longest period without measurable precipitation – 28 days – from August 10 through September 7 of 1995. September started dry and a drought warning was declared by the Pennsylvania Department of Environmental Protection for all of Eastern Pennsylvania on September 1, 1995. On September 14, 1995, the Susquehanna River Basin Commission declared a drought warning. On September 20, 1995, the drought warning was upgraded to a drought emergency for all of eastern Pennsylvania except Perry, Dauphin, Lebanon, Cumberland, York and Lancaster Counties. It was the first drought emergency declared in Pennsylvania since July 1991. Mandatory restrictions were in place concerning water use on lawns, gardens, golf courses, paved surfaces, water fountains and vehicles. Preliminary crop losses caused by the drought were estimated at \$300 million statewide. Corn yields averaged 106 bushels per acre, versus a normal of 120 bushels per acre. Soybean yields averaged 40 bushels per acre, versus a normal of 60 bushels per acre. In alfalfa fields, there were three cuttings instead of four. The lack of water took its toll on livestock, although the greatest damage was done during the oppressive heat wave in the middle of July 1995.

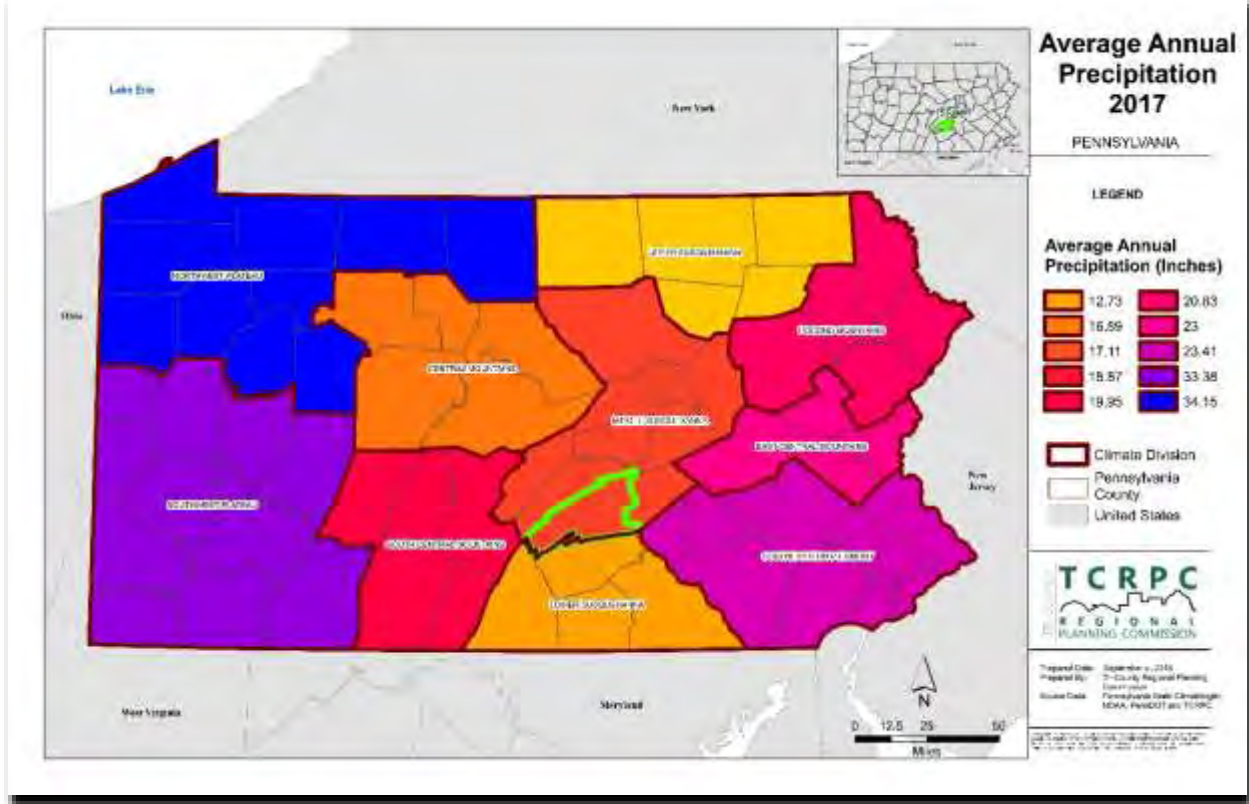
The drought of October 1997 occurred as the growing season drew to a close. Forty-six counties, including Perry, and their contiguous neighbors were declared agricultural disaster

areas by the U.S. Department of Agriculture. Farmers in all Pennsylvania counties became eligible for disaster relief. Precipitation deficits for the growing season from April through October ranged from -1.6 inches in Cumberland County to a disastrous -8.5 inches in York County.

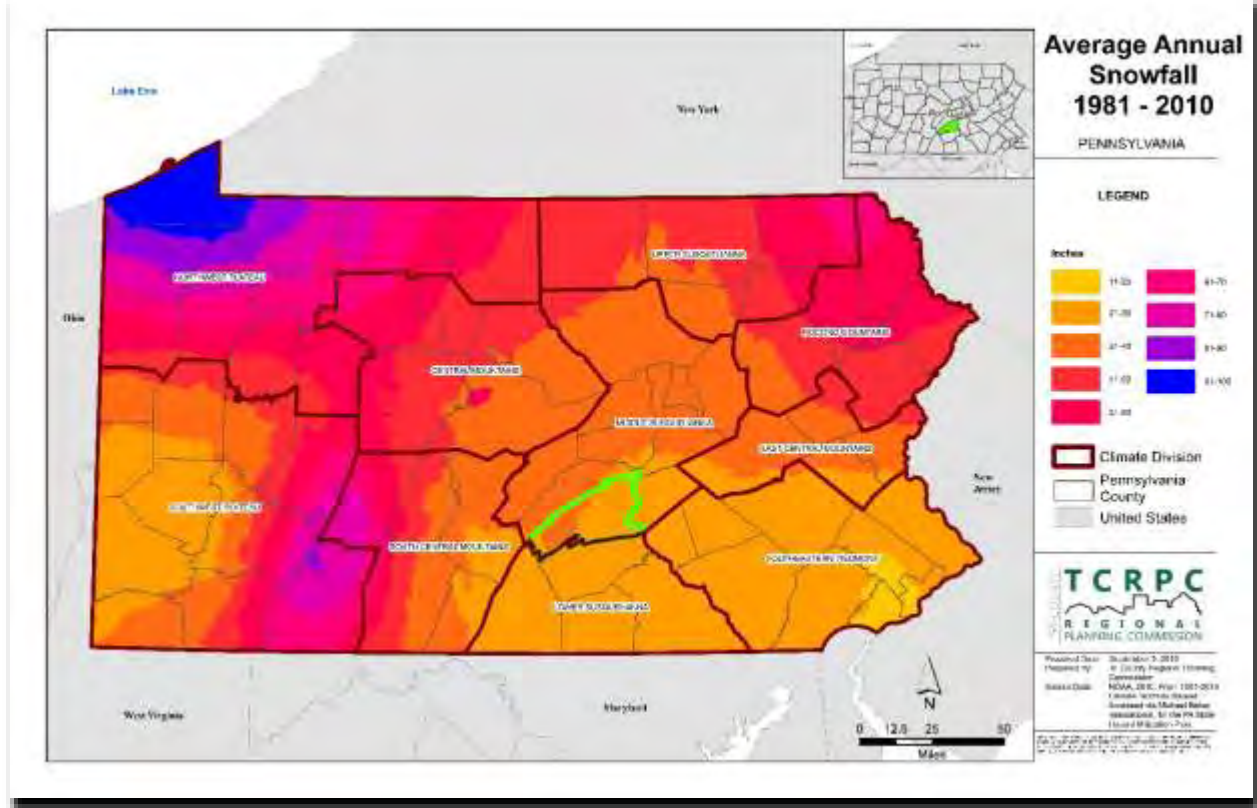
The drought of December 1998 was the result of abnormally dry conditions through the months, which developed into a drought across all of central Pennsylvania by mid-December. Former Governor Tom Ridge declared drought emergency conditions in nine central Pennsylvania counties and drought warnings in others, calling for restrictions on water use and reduced water consumption of 10 to 15 percent. Precipitation departures from normal for the four months leading up to the declaration totaled more than eight inches in a number of locations, with nearly all areas in deficit by more than four inches. Bans were placed on outdoor burning, as numerous woodland and brush fires occurred across the region.

The drought of July 1999 caused Governor Ridge to declare a drought emergency in 55 of the 67 counties of Pennsylvania, following extended dry weather through much of the summer. Water usage was restricted. Precipitation deficits for many counties for the months of May through July averaged between five and seven inches. Precipitation departures for the 365 day period ending in mid-July were over one foot below normal in many places. This is about one-third of total annual normal precipitation in most areas. Streams were empty, wells dried up, and the Susquehanna River hit record low flows. Hot, sunny days combined with the dry weather to take a large toll on crops. Preliminary estimates by the U.S. Department of Agriculture indicated possible crop losses in excess of \$500 million. Some counties experienced 70-100 percent crop loss. The \$500 million figure did not include a 20 percent decrease in milk production due to the drought that would also result in several million dollars in losses. In August 1999, the drought emergency remained in effect for all 55 affected counties. In spite of severe flash flooding in a few locations and normal or above normal precipitation in many others, water tables remained low and water usage was restricted.

MAP 4.13



MAP 4.14



Future Occurrence

Perry County is quite susceptible and the probability is high, drought will hit the county vulnerability assessment once again. Perry County’s geographic location has kept the county from receiving rain relief during extended periods of drought. The distance from the Great Lakes and the Atlantic Ocean and the Chesapeake Bay and the steering currents of the jet stream sometimes impedes delivery of rain when other areas receive the benefit.

Vulnerability Assessment

Drought vulnerability depends on the duration and area of impact. However, other factors contribute to the severity of a drought. Unseasonably high temperatures, prolonged winds, and low humidity can heighten the impact of a drought. Droughts are not uncommon in this area. According to the Pennsylvania Department of Environmental Protection, Perry County has been included in 45 state drought declarations. Nine of these have been classified as a drought emergency, thirteen have been drought warnings, and twenty-two have been drought watches.

TABLE 4.44**PERRY COUNTY DROUGHT STATUS HISTORY (1980-2007)**

Date	Drought Status	Date	Drought Status
November 18, 1980 - April 20, 1982	Emergency	December 8, 1998 - December 14, 1998	Warning
April 26, 1985 - July 29, 1985	Watch	December 14, 1998 - December 16, 1998	Warning
July 29, 1985 - October 22, 1985	Watch	December 16, 1999 - February 25, 2000	Watch
October 22, 1985 - October 29, 1985	Watch	January 15, 1999 - March 15, 1999	Warning
October 29, 1985 - December 19, 1985	Watch	March 15, 1999 - June 10, 1999	Watch
July 7, 1988 - August 24, 1988	Watch	June 10, 1999 - June 18, 1999	Warning
August 24, 1988 - December 12, 1988	Warning	July 20, 1999 - September 30, 1999	Emergency
March 3, 1989 - May 15, 1989	Watch	September 30, 1999 - December 16, 1999	Watch
June 28, 1991 - July 24, 1991	Warning	December 16, 1999 - February 25, 2000	Watch
July 24, 1991 - August 16, 1991	Emergency	February 25, 2000 - May 5, 2000	Watch
August 16, 1991 - September 13, 1991	Emergency	August 8, 2001 - August 24, 2001	Watch
September 13, 1991 - October 21, 1991	Emergency	August 24, 2001 - Nov 6, 2001	Watch
October 21, 1991 - January 16, 1992	Emergency	Nov 6, 2001 - December 5, 2001	Warning
January 17, 1992 - April 20, 1992	Emergency	December 5, 2001 - February 12, 2002	Warning
April 20, 1992 - June 23, 1992	Warning	February 12, 2002 - May 13, 2002	Emergency
June 23, 1992 - September 11, 1992	Warning	May 13, 2002 - June 14, 2002	Warning
September 11, 1992 - January 15, 1993	Watch	June 14, 2002 - August 9, 2002	Watch
September 1, 1995 - September 20, 1995	Warning	September 5, 2002 - November 7, 2002	Emergency

Date	Drought Status	Date	Drought Status
September 20, 1995 - November 8, 1995	Warning	April 11, 2006 - June 30, 2006	Watch
November 8, 1995 - December 18, 1995	Watch	August 8, 2007 - September 5, 2007	Watch
July 17, 1997 - October 27, 1997	Watch	October 5, 2007- January 11, 2008	Watch
October 27, 1997 - November 13, 1997	Watch	January 11, 2008 - Present (as of 1/30/08)	Watch
December 3, 1998 - December 8, 1998	Watch		

*Source: PA Department of Environmental Protection
Watershed Management Drought Information Center*

Probability

The potential for a drought to occur in Perry County is high. According to DEP, during the time period from 1980-2006, there were only eight years in which Perry County did not experience drought conditions. During all other years on record, the County experienced a drought watch, drought warning, or drought emergency. Due to the frequency of drought conditions over this 26-year period, it is logical to assume that the potential for drought is significant in any given year. While some form of drought condition exists frequently in Perry County, the impact depends on the duration of the event, severity of conditions, and area affected.

Maximum Threat

With 36.4 percent of the County devoted to farming, the greatest threat to Perry County is to commercial and family farm operations, agriculture-dependent industries and businesses, and outlying rural areas of the County. The impact drought has on these areas ultimately affects the financial and economic vitality of the County.

Secondary Effects

Wildfire is the most severe secondary effect associated with drought. Wildfires can devastate wooded and agricultural areas, threatening natural resources and farm production facilities. Prolonged drought conditions can cause major ecological changes, such as increases in scrub growth, flash flooding, and soil erosion.

Long-term water shortages can have a high impact on agribusinesses, hydropower-dependent utilities, and other industries reliant on water for production services. Drought can cause municipalities to enforce water rationing and distribution. This strains the availability of consumable water for the community. It also increases Perry County’s vulnerability to other hazards such as severe weather, extreme heat, and public health emergencies. The special needs population of any county also must be considered during drought conditions.

Extreme Temperatures

Location and Extent

Temperatures are generally a regional problem and not necessarily confined to Perry County. Ordinarily, those affected are the elderly or fixed income individuals within the area. Extreme temperatures can result in unmanageable heating or cooling bills or personal injury, such as heat exhaustion or hypothermia. These instances can stretch the capacity of local emergency management services.

Range of Magnitude

As the hazard name suggests this covers either extremely high or extremely low temperatures.

Past Occurrence

Extreme temperature events can occur frequently in Perry County. Table 4.45 below presents past occurrences of extreme temperatures within Perry County from NOAA's National Centers for Environmental Information (NCEI) Storm Events Database. Due to the assortment of sources for meteorological data, not all sources have been identified or searched. Therefore, Table 4.45 may not represent all events that have occurred in Perry County.

TABLE 4.45

PERRY COUNTY EXTREME TEMPERATURE EVENTS

Date	Type
6/13/1994	Heat Waves
7/5/1994	Heat Wave
11/1/1994	Unseasonably Warm
1/1/1995	Unseasonably Warm
1/14/1995	Record Warmth
2/6/1995	Extreme Cold
7/1/1995	Excessive Heat
7/13/1995	Heat Wave
7/29/1995	Heat Wave
8/1/1995	Unseasonably Warm and Dry
8/12/1995	Heat Wave
8/29/1995	Heat Wave
7/5/1999	Excessive Heat
7/17/2006	Heat
7/31/2006	Heat
8/1/2006	Heat
02/05/2007	Extreme Cold/Wind Chill
07/21/2011	Excessive Heat
02/15/2015	Extreme Cold/Wind Chill

07/25/2016	Excessive Heat
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Source: National Centers for Environmental Information (NCEI), 2020

Future Occurrence

Dramatic swings in temperature extremes are occurring far more frequently. Climate change is making it easier for the northeastern US to experience these dramatic shifts. These forecasted shifts are detailed within the content of the fourth [National Climate Assessment](#).

Vulnerability Assessment

Extreme temperatures are usually a regional problem. In relatively rural communities, such as Perry County, crop damage can occur. This can be the result of excessive heat or unseasonably cold conditions.

TABLE 4.46

PERRY COUNTY WEATHER AVERAGES AND RECORDS

Month	Avg. High	Avg. Low	Mean	Avg. Precipitation	Record High	Record Low
Jan	37°F	19°F	28°F	2.86 in.	74°F (1950)	-14°F (1968)
Feb	41°F	21°F	31°F	2.68 in.	77°F (1985)	-16°F (1961)
Mar	51°F	29°F	40°F	3.52 in.	88°F (1986)	1°F (1989)
Apr	63°F	38°F	51°F	3.20 in.	96°F (1976)	17°F (1982)
May	72°F	48°F	60°F	4.02 in.	96°F (1962)	29°F (1978)
Jun	80°F	57°F	69°F	4.00 in.	104°F (1952)	38°F (1972)
Jul	85°F	62°F	74°F	3.48 in.	106°F (1966)	45°F (1979)
Aug	82°F	61°F	71°F	3.35 in.	103°F (1955)	39°F (1949)
Sep	75°F	53°F	64°F	3.74 in.	103°F (1953)	29°F (1963)
Oct	64°F	41°F	52°F	3.26 in.	93°F (1962)	20°F (1969)
Nov	52°F	33°F	43°F	3.45 in.	84°F (1950)	10°F (1976)
Dec	41°F	24°F	33°F	3.20 in.	75°F (1984)	-16°F (1960)

Source: National Climatic Data Center

The elderly and youth populations are the most vulnerable to severe weather, due to their mobility challenges, disabilities, fixed income, etc.

Probability

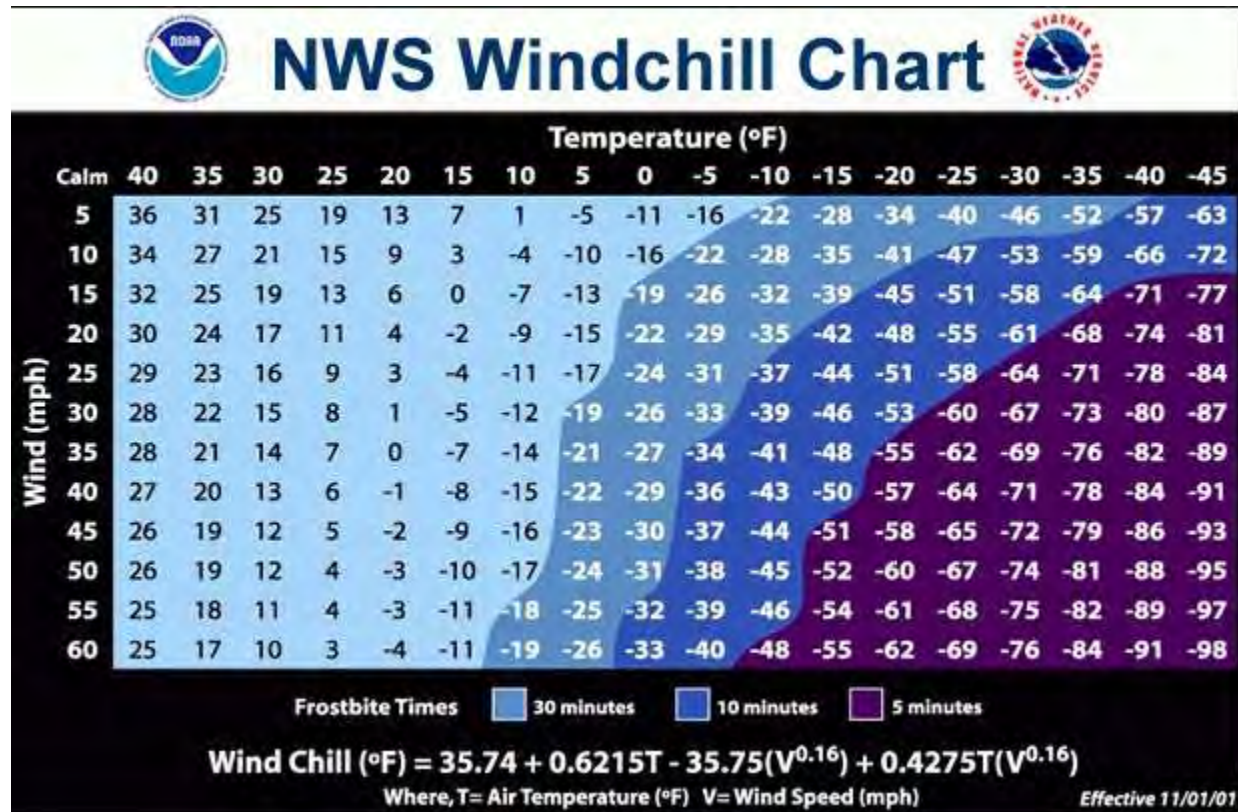
There is a high probability of severe weather affecting Perry County. Hurricanes and tropical storms, heavy fog, high winds, unseasonable temperatures, and winter weather all affect Perry County.

Maximum Threat

Extreme Temperatures can take place on any given day. Most often, instances of severe weather are regional events affecting large areas. The maximum threat to Perry County presently ranges from a low of -16°F to as high as 106°F.

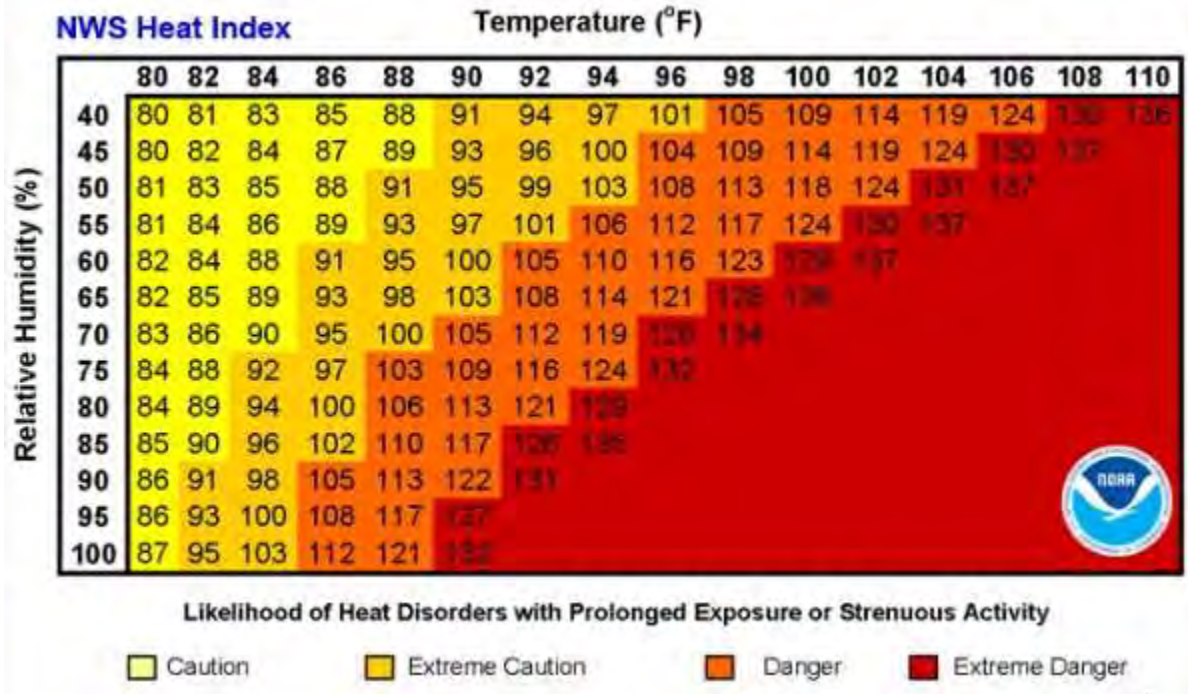
With cold temperatures the two most concerning threats are frostbite and freezing to death.

CHART 4.1



With hot temperatures the three most concerning threats are dehydration, heat exhaustion and heat stroke.

CHART 4.2



Secondary Effects

Considering heat, ground level ozone levels can rise and exacerbate one’s ability to breathe.

Flooding, Including Flash Floods, and Ice Jams

Location and Extent

Flooding is the leading cause of death among all types of natural disasters throughout the United States, with its ability to roll boulders the size of cars, tear out trees, and destroy buildings and bridges. Typically the result of heavy precipitation, snowmelts, and ice jams, major flood events can last several days or even weeks. Unfortunately, many homeowners fail to realize that the average insurance policy does not cover flooding. For this reason, floods are a costly hazard.

A property's vulnerability to a flood depends on its location in the floodplain. The properties that lie along the banks of a waterway are the most vulnerable. The property within the floodplain is broken into sections depending on its distance from the waterway. The 10-year flood zone is the area that has a 10 percent chance of being flooded every year. However, this label does not mean that this area cannot flood **more than** once every 10 years. It simply designates the probability of a flood of this magnitude every year. Further away from this area is the 50-year floodplain. This area includes the 10-year floodplain, plus additional property. The probability of a flood of this magnitude occurring during a one-year period is two percent. A summary of flood probability is shown in the table above.

In the past, heavy rains caused most of Perry County's flood problems. Heavy rains cause small creeks and streams to overflow their banks, leading to road closures and other damages.

Flooding poses the biggest threat to those who reside or conduct business in the floodplain. The most significant hazard exists for businesses in the floodplain that process, use, and/or store hazardous materials. A flood could potentially allow for hazardous materials to leak out of these areas. As the water recedes, it would spread the hazardous materials throughout the area. Also threatened are the agricultural areas in the floodplain. Most flood damage to property and structures located in the floodplain is caused by water exposure to the interior, high-velocity water, and debris flow.

Perry County is prone to two types of floods:

- Riverine Flood – Occurs in the floodplain of a river or stream when the amount of water and the rate at which it is moving increases.
- Flash Flood – A type of riverine flood that occurs after a heavy storm, when the ground cannot absorb the high amount of precipitation. This can occur when heavy precipitation falls on frozen or already-saturated soil.

Flooding – Susquehanna River Basin

The Susquehanna River Basin encompasses much of Pennsylvania and portions of New York to the north and Maryland to the South. It is composed of the Main Stem Susquehanna, North Branch Susquehanna, West Branch Susquehanna, Chemung Sub-basin and Juniata Sub-basin. Perry County is located along the border of the Susquehanna River Basin and the Juniata Basin to the west.

The Susquehanna River Basin is one of the most flood-prone watersheds in the entire nation. The main stem of the Susquehanna and its many tributaries drain 27,510 square miles of New York, Pennsylvania, and Maryland. Since the early 1800s, the main stem of the Susquehanna has flooded every 20 years, on average. The Susquehanna Basin also is vulnerable to frequent, localized flash floods every year. Since flood records were first kept in 1810, the Susquehanna River Basin's most devastating floods occurred in: 1936 (St. Patrick's Day Flood); 1955 (Hurricanes Connie and Diane); 1972 (Hurricane Agnes); 1975 (Hurricane Eloise); 1996 (January flooding); and 2004 (Tropical Storm Ivan). In 1972, Hurricane Agnes caused the worst recorded flooding in the basin. The flooding caused 72 deaths and \$2.8 billion in damage; flood levels exceeded the record levels of 1936 by as much as six feet in some places.

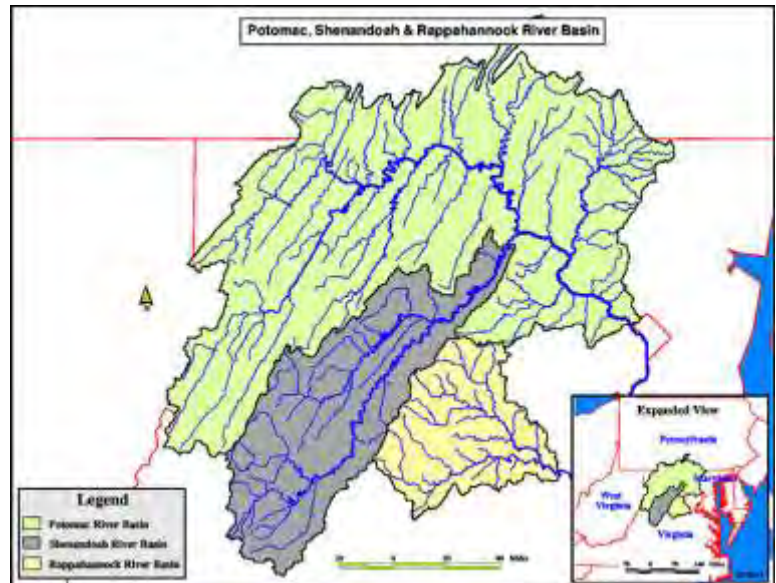


Despite frequent flooding, seven upstream dams contribute to the reduction of flood hazards on the Susquehanna River: Stillwater Reservoir, located approximately nine miles north of Carbondale, Pennsylvania, on the Lackawanna River; East Sidney Lake, located approximately eight miles east of Sidney, New York, on Ouleout Creek; Whitney Point Dam, located approximately one mile north of Whitney Point, New York, on the Otselic river; Almond Dam, located approximately two miles northwest of Hornell, New York, on Canacadea Creek; Arkport Dam, located approximately five miles northeast of Hornell, New York, on the Canisteo River; Tioga-Hammond Dam, located approximately 20 miles southwest of Elmira, New York, on the Tioga River and Crooked Creek; and Cowanesque Lake, located on the Cowanesque River approximately two miles above the confluence with the Tioga River at Lawrenceville, Pennsylvania.

Flooding – Potomac River Basin

While the Potomac River does not flow through the Commonwealth of Pennsylvania, the Potomac basin is actually Pennsylvania’s fourth largest. The total size of the Potomac basin is 14,670 square miles. Approximately 11 percent of the basin is located within Pennsylvania. A tiny portion reaches into Perry County.

Pennsylvania has ten tributaries to the Potomac: Wills Creek, Evitts Creek, Town Creek, Sideling Creek, Tonoloway Creek, Licking Creek, Conococheague Creek, Monocacy River, the Marsh Creek, and Rock Creek.



According to the United States Geological Survey (USGS), the Potomac River Basin is experiencing rapid growth and development. According to a recent study from the Chesapeake Bay Program, population in the basin is expected to increase by almost twenty percent from 2000 to 2020. Some areas of the basin, especially those within commuting distance of Washington, DC, are projected to grow much faster.

Range of Magnitude

**TABLE 4.47
FLOOD PROBABILITY SUMMARY**

Flood Recurrence	Annual Chance of Occurrence
10-year storm event	10.00%
50-year storm event	2.00%
100-year storm event	1.00%
500-year storm event	0.20%

Source: FEMA

Past Occurrence

Flooding - Municipal Hazard Analysis

The National Centers for Environmental Information (NCEI), formerly the National Climate Data Center (NCDC) maintains a historical record of flooding since 1993 in its Storm Event Database. This database measures all weather events from 1993 – October 2019. According to the Storm Event Database, Perry County has experienced 39 flood events since 1993. Of these, 18 events were categorized as flash floods, 21 as floods, and 2 as a combination flood/flash flood. The most significant occurrence of flooding was due to heavy rains. A summary of the flood history of Perry County since November 1993 can be seen in Table 4.48 below. Due to the assortment of sources for meteorological data, not all sources have been identified or searched. Therefore, Table 4.48 may not represent all events that have occurred in Perry County.

The major cause of flooding in Perry County is slow moving rain storms, originating from the south or southwest, with an abundance of moisture that has been transported from the Gulf of Mexico and resupplied with Atlantic Ocean moisture by strong, stationary Bermuda highs. A blocking high pressure area to the northeast of Pennsylvania contributes to these conditions. Intense local flash floods are most likely to occur in squall lines just to the east of a slow moving north-south oriented cold front. These are usually warm weather phenomena, where afternoon heating adds to the instability of the already unstable, moist air mass. Storms of tropical origin affect the Susquehanna River valley an average of once in three years. Their usual path is from the south to the northeast, but a few have traveled from the southeast to the northwest. The tropical storm season runs from June to November.

The Pennsylvania Emergency Management Agency (PEMA) maintains historical records of declared disasters since 1954. According to PEMA, five flooding events since 1954 have resulted in a declared disaster. Tropical Depression Ivan in 2004 required a President's Declaration of Major Disaster, and resulted in individual and public assistance to Perry County. The extensive winter flooding in January 1996, Hurricane Agnes in June 1972, Hurricane Eloise in September 1975, and Hurricane Floyd in September 1999, all resulted in a Governor's Proclamation and President's Declaration of Major Disaster.

TABLE 4.48

PERRY COUNTY FLOODING EVENT HISTORY, 1993-2019

Date	Type	Location	Damages (If Applicable)
11/28/1993	Flood/Flash Flood	N/A	N/A
1/20/1995	Flood	N/A	N/A
10/21/1995	Flood/Flash Flood	N/A	N/A
1/19/1996	Flood	Perry County	N/A
1/19/1996	Flash Flood	Countywide	N/A
9/6/1996	Flash Flood	Countywide	Extremely heavy rains from the remnants of Hurricane Fran caused major flooding. Roads and streams flooded. 1 fatality. Female, 79, attempted to leave her home surrounded by 4 feet of water.
9/13/1996	Flash Flood	Western Perry County	N/A
12/13/1996	Flash Flood	Countywide	N/A
9/11/1997	Flash Flood	Countywide	N/A
11/8/1997	Flash Flood	Western Perry County	N/A
1/8/1998	Flash Flood	Countywide	N/A
3/21/1998	Flash Flood	Countywide	N/A
9/6/1999	Flash Flood	Eastern Perry County	Heavy rain from Dennis flooded roads and basements. Route 11 & 15 was closed north of Liverpool due to mud

			slides. Approximately \$20,000 in property damages were reported.
9/16/1999	Flash Flood	Countywide	Approximately \$20,000 in property damages were reported.
9/1/2000	Flash Flood	Duncannon	Heavy rains flooded streets. Route 11/15 was flooded. Approximately \$10,000 in property damages were reported.
8/14/2001	Flash Flood	Duncannon	A mudslide was triggered near Duncannon in Perry County, due to heavy rain from thunderstorms. This mudslide caused some trees to fall, blocking Route 849.
8/9/2003	Flash Flood	Blain	Heavy rains caused flash flooding, closing Fowler Road and causing a mudslide in Blain.
12/11/2003	Flood	Countywide	Heavy rainfall caused Sherman Creek at Shermans Dale to exceed flood stage. The creek rose above its flood stage of 9.0 feet at 6:30 AM EST on the 11th, crested at 11.37 feet at 1:00 PM EST on the 11th, then fell back below flood stage at midnight on the 12th.
7/12/2004	Flash Flood	Blain	Heavy rain caused flash flooding in Perry County the evening of July 12th 2004. Minor flooding which began around 1600 LST transitioned into significant flooding. Mudslides closed portions of route 274 and 74 near Blain. Route 17 was also closed due to flood waters.
9/17/2004	Flood	Countywide	N/A
9/18/2004	Flood	Countywide	Heavy rain caused the Sherman Creek at Shermans Dale to exceed its flood

			stage of 9 feet. The river rose above flood stage at 02:45 EST on the 18th, crested at 16.31 feet at 10:30 EST on the 18th, and fell below flood stage at 01:00 EST on the 19th.
9/18/2004	Flood	Countywide	Heavy rain caused the Juniata River at Newport to exceed its flood stage of 22 feet. The river rose above flood stage at 22:30 EST on the 18th, crested at 23.58 feet at 06:30 EST on the 19th, and fell below flood stage at 16:00 EST on the 19th.
9/28/2004	Flood	Countywide	N/A
3/28/2005	Flood	Countywide	This storm, combined with abundant low level moisture drawn from the Gulf of Mexico and western Atlantic Ocean, produced very heavy rainfall across the lower Susquehanna Valley from Monday afternoon into early Tuesday morning. As a result of the heavy rainfall, numerous streams overflowed their banks onto adjacent roadways, resulting in road closures, particularly during the pre-dawn hours of Tuesday. The flooding then receded rather quickly around, or just after sunrise on Tuesday.
3/29/2005	Flood	Countywide	Heavy rain caused Sherman Creek at Shermans Dale to flood. The creek exceeded flood stage of 9 feet at 04:15 EST on the 29th, crested at 9.7 feet at 10:15 EST on the 29th, then fell back below flood stage at 14:45 EST on the 29th.
4/2/2005	Flood	Countywide	Heavy rain caused Shermans Creek at Shermans Dale to flood. The creek exceeded flood stage of 9 feet at 16:30 EST on the 2nd, crested at 9.36 feet at 18:15 EST on the 2nd, then fell back

			below flood stage at 22:45 EST on the 2nd.
4/2/2005	Flood	Countywide	<p>Abundant moisture drawn from both the Gulf of Mexico and Atlantic Ocean combined with the dynamics from the strengthening storm system to produce widespread heavy rainfall across the lower Susquehanna Valley during the daytime hours on Saturday. Average rainfall amounts of 1 to 3 inches occurred during this time. This heavy rainfall led to numerous road closures as smaller streams and creeks overflowed their banks during Saturday afternoon and evening. The heavy rainfall tapered off late Saturday night, but subsequent flooding from runoff persisted into Sunday morning.</p>
11/30/2005	Flood	Countywide	<p>Heavy rain caused Sherman Creek at Shermans Dale to flood. The creek exceeded flood stage of 9 feet at 04:00 EST on the 30th, crested at 9.37 feet at 05:30 EST on the 30th, then fell back below flood stage at 07:45 EST on the 30th.</p>
6/27/2006	Flash Flood	Countywide	<p>Heavy rain associated with a stalled frontal boundary, interacting with the remnants of a weak tropical system, caused flash flooding throughout central and eastern Pennsylvania from June 27 through June 28. While flash flooding ended on the 28th, flood waters continued in some locations until July 1st. In Perry County, numerous roads were closed due to flood waters. Kings Highway in Marysville was damaged by flood waters, and there was a rock slide in Miller Township near Newport.</p>

			Perry County received a disaster declaration and was eligible for FEMA Public Assistance Funding under DR-1649.
6/27/2006	Flood	Shermans Dale	Heavy rain caused Sherman Creek at Shermans Dale to flood. The creek exceeded flood stage of 9.0 feet at 19:30 EST on the 27th, crested at 11.71 feet at 02:00 EST on the 28th, then fell back below flood stage at 11:00 EST on the 28th.
03/05/2008	Flood	Blain	Heavy rain caused flooding of several streams and creeks in Perry County. 18 residents were rescued from a trailer park along Creek Road outside of Shermansdale. Rising flood waters in Carroll, Spring, Centre and Jackson Townships also closed eight other roads and one school.
05/28/2009	Flash Flood	Shermans Dale	Heavy rain from thunderstorms caused extensive flash flooding across central and western portions of Perry County. Numerous roads were flooded throughout the county, including Route 233, Route 850, Route 274, Route 34 and Route 74. Approximately 25 to 30 homes along Sherman Creek were evacuated due to rising flood waters. Five water rescues were performed. Over 100 basements were flooded. Much of the flooding occurred between Landisburg and Loysville. Approximately \$50,000 in property damages were reported.
05/29/2009	Flood	Shermans Dale	Heavy rain in the headwaters of Sherman Creek caused a sharp rise along the creek, and eventually lead to moderate flooding. A rise of nearly 12

			<p>feet in less than 6 hours was the result of between 5 and 7 inches of rain falling over a portion of the basin.</p> <p>Evacuations of 25 to 30 homes occurred along Sherman Creek due to the rising flood waters. Several homes were isolated due to flood waters, and some sustained flooding (basements, workshops). Flood waters rapidly subsided by late morning.</p> <p>Approximately \$15,000 in property damages were reported.</p>
03/10/2011	Flood	Duncannon, Shermans Dale	<p>Several roads were closed across the county including PA 849/Duncannon Subway between US 22/322 and Market Street in Penn Township; Bistline Bridge Road between Red Rock Road and Couchtown Road in Southwest Township; PA 850 between PA 274/Shermans Valley Road and Center Road in Northeast Madison Township; PA 850 between PA 34/Spring Road in Carroll Township and Mill Road in Spring Township; Fowlers Hollow Road between Union Road/Back Hollow Road in Toboyne Township and Manassas Road in Jackson Township; Dellville Road between Linton Hill Road in Wheatfield Township and Haas Drive in Penn Township.</p> <p>The Sherman Creek at Shermans Dale river gage crested at 11.80 feet on March 11th at 4am. This is categorized as a moderate flood. At 11.0 feet a number of homes along River Road and other low lying areas adjacent to Sherman Creek are affected by high water.</p>
04/16/2011	Flood	Shermans Dale	<p>Sherman Creek at Shermans Dale reached moderate flood stage. A</p>

			number of homes along Creek Road and other low lying areas adjacent to Sherman Creek are affected by high water.
09/07/2011	Flood	Cove	<p>Sherman Creek at Shermans Dale crest above moderate flood stage at 11.04 feet. Flood stage is 9.0 feet.</p> <p>Flooding was observed along the Susquehanna River in Perry County, primarily in the Duncannon area. Fortunately, water levels on the Juniata River remained below flood levels during this event. One building was reported destroyed in Perry County, with 74 suffering major damage and 158 suffering minor damage. A total of 234 structures were impacted during this event, and damages were reported at \$10,500 for public facilities across the county.</p> <p>Perry County received a disaster declaration and was eligible for FEMA Individual Assistance and Public Assistance Funding under DR-4030 and EM-3340.</p>
10/10/2013	Flood	New Germantown	Excessive rainfall between 5-10 inches produced widespread significant flooding. A rock slide closed US 322 WB between the Millerstown and Newport exits in Howe Township.
05/16/2014	Flood	New Germantown	Heavy rainfall in excess of 3 inches produced widespread minor flooding and impacted at least 20 roads (either closed or restricted to one-lane) throughout the county. The Sherman Creek at Shermans Dale exceeded moderate flood stage, impacting a number of homes along River Road

			and other low-lying areas adjacent to Sherman Creek.
07/27/2014	Flash Flood	Alinda	Heavy rain produced flash flooding and closed a section of SR 74 in Spring Township near Landisburg. Small stream and road flooding was also observed in Shermansdale.
06/08/2015	Flash Flood	Millerstown	Heavy rainfall brought flash flooding to the Millerstown area. The local fire company performed 2 water rescues, 1 from a house and 1 from a motorist that tried to drive through a flooded road. Eight flooded basements with as much as 7 feet of water in them was reported. Roads flooded included North Market Street at Apple Street and Sunbury Path and Locust Alley. Sunbury Path at Mill Race Road and Raccoon Valley Road west of the borough also had farm fields flood across the roadways.

Source: NOAA National Centers for Environmental Information (NCEI)

Future Occurrence

Flooding frequency shows many signs of increasing in intensity. When paired with increased duration this presents problems. Climate change as previously mentioned also influences precipitation and has also been studied in the [National Climate Assessment](#).

Vulnerability Assessment

The Federal Emergency Management Agency has developed HAZUS-MH (**H**azards **U**nited **S**tates – **M**ulti **H**azard), which is a plug in to ESRI’s ArcMap geographic information systems (GIS) software to estimate potential losses from natural disasters. HAZUS-MH was used to model the impacts of a 100-year, or 1% annual chance flood on Perry County. Additionally, an exposure analysis was performed to estimate the total market value of structures which could be impacted by a 100-year flood event. These results and HAZUS estimated losses are discussed in the Economic Vulnerability Assessment section at the end of this chapter. Estimated impacts to Perry County are discussed below in Tables 4.72 and 4.73.

The municipal summaries found in Appendix D detail flood threats within Perry County. This analysis was taken from the Federal Emergency Management Agency (FEMA) Flood Insurance Study. Additional information was added from the United States Census Bureau.

Probability

The magnitude of the flood is entirely dependent upon its contributing forces. How much water is contributed, the duration by which it lasts, how much water occupies the drainage facilities or natural drainageways, and climate change all factor into flood probability.

Maximum Threat

The maximum threat to Perry County would be a county-wide long term rain event similar to the tropical depressions the area was visited with in the past. Our low-elevated river communities like Duncannon, Newport, and Marysville are the most susceptible. Equally concerning are other low-land boroughs like Blain and villages like Shermans Dale and Loysville.

Secondary Effects

Aside from the building collapse of homes and business, the potential loss of human life, the loss of quality agricultural land and soil, flooding can also brings interruptions to logistical transportation and leisure travel as inundated roadways are closed.

Impacts held to building foundations may increase radon intrusion after an event. Depending on water velocities, hazardous materials storage facilities might be found to be at risk. Raging currents could lead to stream bank erosion which could lead to landslides and rock fall. Utility disruption could occur if lines are impacted by flood water. Also after an event, structures may be left in disrepair, and over time could be susceptible to building collapse.

Hailstorm

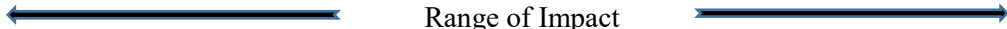

Location and Extent

Hailstones are produced by water droplets being frozen, thawed and refrozen by being circulated in the upper levels of an intense thunderstorm until the updrafts of the storm can no longer carry the hailstone’s weight.

Range of Magnitude

TABLE 4.49

HAILSTONE SIZE AND RANGE OF POTENTIAL DAMAGE

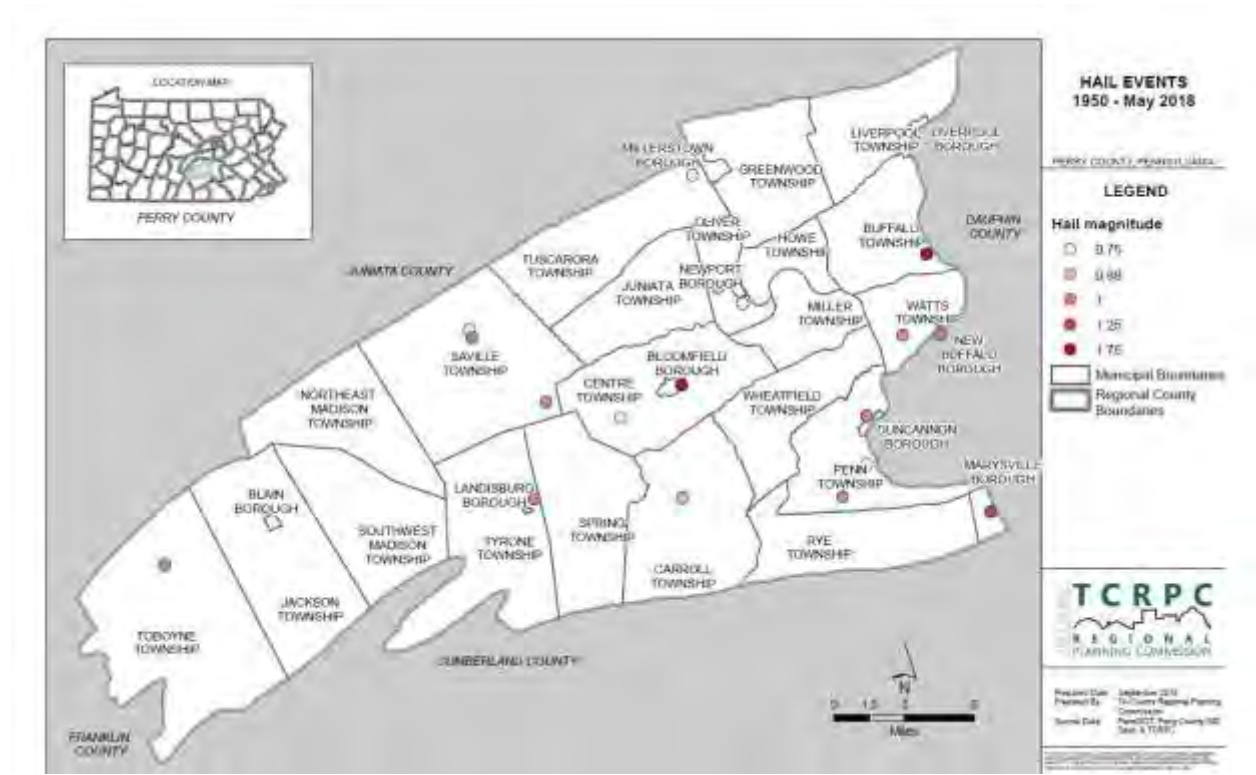
 Range of Impact				
Low	Low - Medium	Medium	High	Severe
Pea-size (1/4") inch, to marble- sized (1/2")	Dime-sized (3/4") to Quarter-sized (3/4")	Ping pong ball or golf ball-sized (1 3/4")	Baseball-sized (3")	Softball-sized (4 1/2")
Speed of decent				
 25 mph ← → 100mph				
Expected Damage				
Stinging of exposed skin; Can damage crops	Welting or bruising of the skin; Will destroy crops	Dangerous; Damage to vehicles; Will destroy crops; Can strip trees of leaves	Extremely dangerous to animals and humans; Will destroy crops and strip trees of leaves	Deadly to humans and animals that cannot reach shelter; Will destroys crops and strip trees of leaves

Past Occurrence

Perry County has had several documented hailstorm events. The following map displays the reported location and the size of the hailstones experienced with each event.

MAP 4.15

PERRY COUNTY HAIL EVENTS



Future Occurrence

Severe thunderstorms will continue to produce hail in Perry County. Historically, hail has not been recorded as being larger than 2” in diameter. Based on the historic frequency, one can expect a hail event to occur somewhere in Perry County once every five years.

Vulnerability Assessment

Everyone is vulnerable to hail in the Perry County. Knowing how to protect yourself during such an event will reduce the chance for injury. Remaining under shelter until such an event passes is key to preventing injury. When operating equipment or vehicles finding a safe place to park the equipment or vehicle will prevent any sort of secondary accident caused by the event.

Probability

There are increasing probabilities of hailstone producing storms, as the intensity of storms continues to rise. Climate change is driving this rise in storm intensity.

Maximum Threat

The largest recorded hailstone fell to earth as recently as July 23, 2010 in Vivian, South Dakota. It measured 8.0 inches in diameter, 18.62 inches in circumference and weighed 1.93 pounds. According to the National Weather Service (https://www.weather.gov/hun/event_03192018_hail)

Damage can be quite extensive depending upon the size of the hailstones and the duration of the event. Vehicles and equipment being operated pose a high risk. Rooftop damage to aluminum roofs, shingles, sky lights can also occur. Depending upon the trajectory windows, and the siding of buildings could also be at risk. Unsheltered humans and animals are at the greatest risk of injury.

Secondary Effect

The surprise of a hailstone impact to the windshield of an operating vehicles may lead to a reactionary traffic accidents.

Hurricane, Tropical Storm, and Nor'easter

Location and Extent

Severe weather affects the entire Commonwealth and can be expected any time of the year. Severe weather for Perry County is considered to include: blizzards and/or heavy snowfall (discussed in a separate profile), heavy fog, hail, heavy precipitation (rain), high winds, ice storms, unseasonable temperature extremes, hurricanes, and severe thunderstorms. (Tornados will be discussed in a separate profile.)

Snowstorms occur approximately five times per year. These storms are more prevalent in the northern and western regions of Pennsylvania and include ice and high wind. They are frequently seen in Perry County.

Hurricanes, tropical storms, and windstorms occur in Perry County in the spring and summer. Most hurricanes that approach Perry County are downgraded to tropical storms or tropical depressions by the time they reach central Pennsylvania. Heavy rain and flooding produced by a hurricane, tropical storm, or tropical depression will have the greatest impact on the County.

Extreme temperatures can be devastating to any area. Extreme heat can cause sunburn, heat cramps, heat exhaustion, and heat/sun stroke. Likewise, extreme cold can cause hypothermia and frost bite.

Range of Magnitude

Considering rain events, the following table provides the range of intensity by storm:

**TABLE 4.50
HURRICANE WIND SPEEDS**

Type of Storm	Maximum Sustained Winds (mph)	Estimated Damage
Tropical Depression	Less than 39 mph	
Tropical Storm	39 - 73 mph	
Saffir-Simpson Scale		
Category 1 Hurricane	74 - 95 mph	Minimal damage to vegetation
Category 2 Hurricane	96 - 110 mph	Moderate damage to structures
Category 3 Hurricane	111 - 130 mph	Extensive damage to small structures
Category 4 Hurricane	131 - 155 mph	Extreme structural damage
Category 5 Hurricane	Greater than 155 mph	Catastrophic structural failure possible

The following chart defines various winter weather conditions:

Past Occurrence

Perry County, as well as the entire Commonwealth, is vulnerable to a wide range of natural disasters. Typically, these disasters are caused by severe weather. A summary of disaster declarations since 1996 from severe weather that affected Perry County can be seen below.

**TABLE 4.51
DISASTER DECLARATIONS AFFECTING PERRY COUNTY**

Winter Storms	Blizzards	Hurricanes/ Tropical Storms	Floods	Droughts
Jan-66	Feb-78	Agnes, June 1972	Flood (Eloise) , September 1975	Jul-91
Feb-72	Mar-93	Windstorm, April 1975	Oct-76	Jul-99
Jan-78	–	Floyd, September 1999	Jan-96	Feb-02
Jan-94	–	Hurricane Isabel/Henri, September 2003	Sep-96	–
Jan-96	–	Tropical Depression Ivan, September 2004	Jun-06	–
Feb-03	–	Hurricane Katrina, September 2005	–	–

Source: National Climatic Data Center

Spring and Summer Storms

Every year, Perry County experiences severe spring and summer storms with associated lightning and tornados. (Tornados will be addressed in a separate profile.) These storms have an immediate impact, as well as longer lasting secondary effects. Over the past 50 years, these storms have caused significant damage. A table of regional severe storms since 1963 is presented here.

**TABLE 4.52
PERRY COUNTY SEVERE STORMS**

Date	Type	Property Damage	Date	Type	Property Damage
5/10/1963	Thunderstorm Wind	\$0	6/22/2006	Thunderstorm Wind	\$0
7/24/1967	Thunderstorm Wind	\$0	6/22/2006	Thunderstorm Wind	\$0
6/27/1978	Thunderstorm Wind	\$0	6/29/2006	Thunderstorm Wind	\$0
8/10/1980	Thunderstorm Wind	\$0	6/29/2006	Thunderstorm Wind	\$0
7/12/1985	Thunderstorm Wind	\$0	12/1/2006	Thunderstorm Wind	\$10,000
7/12/1985	Thunderstorm Wind	\$0	12/1/2006	High Wind	\$0
6/11/1986	Thunderstorm Wind	\$0	5/12/2007	Thunderstorm Wind	\$0
8/5/1986	Thunderstorm Wind	\$0	6/8/2007	Thunderstorm Wind	\$0

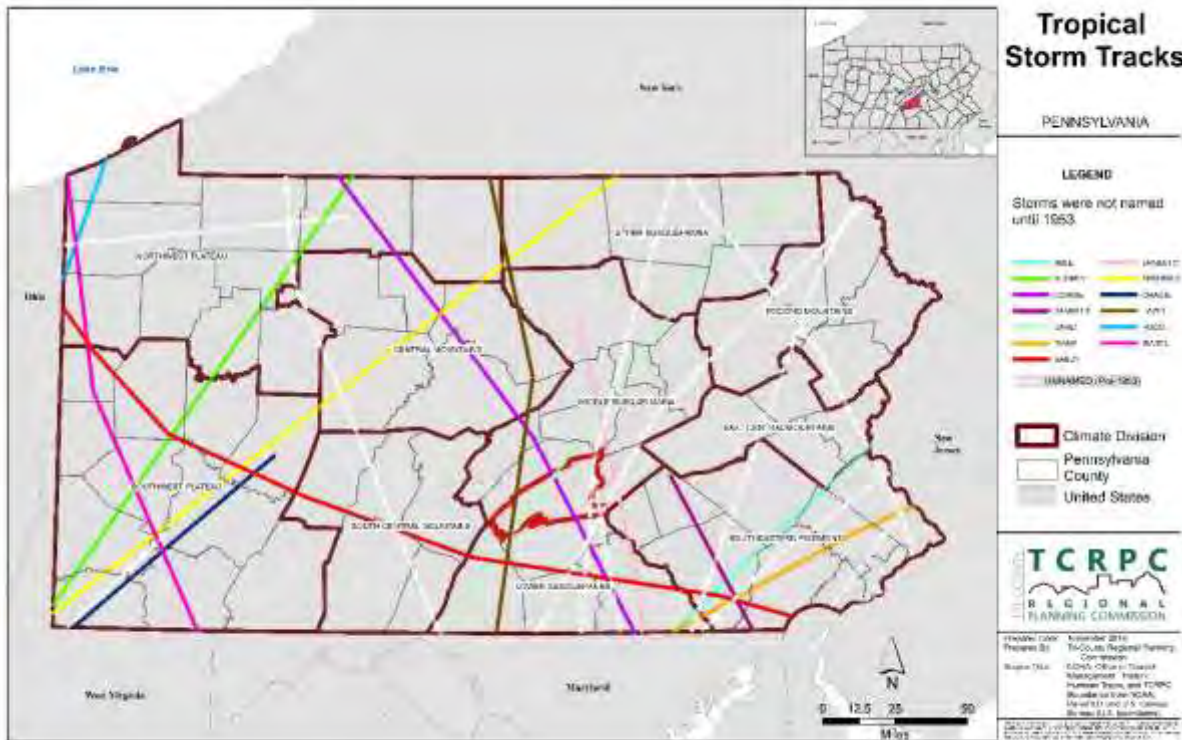
Date	Type	Property Damage	Date	Type	Property Damage
6/7/1988	Thunderstorm Wind	\$0	6/12/2007	Thunderstorm Wind	\$0
11/20/1989	Thunderstorm Wind	\$0	6/13/2007	Thunderstorm Wind	\$0
6/30/1990	Thunderstorm Wind	\$0	6/19/2007	Thunderstorm Wind	\$0
7/5/1990	Thunderstorm Wind	\$0	6/27/2007	Thunderstorm Wind	\$0
4/9/1991	Thunderstorm Wind	\$0	7/5/2007	Thunderstorm Wind	\$0
5/6/1991	Thunderstorm Wind	\$0	7/5/2007	Thunderstorm Wind	\$0
5/29/1991	Thunderstorm Wind	\$0	6/10/2008	Thunderstorm Wind	\$0
9/16/1991	Thunderstorm Wind	\$0	6/16/2008	Thunderstorm Wind	\$0
9/16/1991	Thunderstorm Wind	\$0	6/27/2008	Thunderstorm Wind	\$40,000
7/6/1994	Thunderstorm Wind	\$0	7/20/2008	Thunderstorm Wind	\$10,000
8/25/1994	Thunderstorm Wind	\$0	7/23/2008	Thunderstorm Wind	\$0
8/27/1994	Thunderstorm Wind	\$0	8/7/2008	Thunderstorm Wind	\$5,000
4/9/1995	Thunderstorm Wind	\$0	12/31/2008	High Wind	\$5,000
4/9/1995	Thunderstorm Wind	\$0	2/12/2009	High Wind	\$10,000
5/24/1995	Thunderstorm Wind	\$0	6/26/2009	Thunderstorm Wind	\$5,000
5/29/1995	Thunderstorm Wind	\$0	7/11/2009	Thunderstorm Wind	\$5,000
6/7/1995	Thunderstorm Wind	\$0	8/9/2009	Thunderstorm Wind	\$5,000
6/11/1995	Thunderstorm Wind	\$0	8/18/2009	Thunderstorm Wind	\$5,000
7/6/1995	Thunderstorm Wind	\$0	8/19/2009	Thunderstorm Wind	\$5,000
7/6/1995	Thunderstorm Wind	\$0	8/20/2009	Thunderstorm Wind	\$5,000
7/16/1995	Thunderstorm Wind	\$0	4/8/2010	Thunderstorm Wind	\$5,000
10/5/1995	Thunderstorm Wind	\$0	4/8/2010	Thunderstorm Wind	\$5,000
11/11/1995	Thunderstorm Wind	\$0	4/16/2010	Thunderstorm Wind	\$0
4/26/1996	Thunderstorm Wind	\$0	7/12/2010	Thunderstorm Wind	\$5,000
4/26/1996	Thunderstorm Wind	\$30,000	7/21/2010	Thunderstorm Wind	\$5,000
5/11/1996	Thunderstorm Wind	\$0	4/27/2011	Thunderstorm Wind	\$5,000
6/12/1996	Thunderstorm Wind	\$0	4/28/2011	Thunderstorm Wind	\$5,000
6/20/1996	Thunderstorm Wind	\$0	7/18/2011	Thunderstorm Wind	\$5,000
7/30/1996	Thunderstorm Wind	\$0	8/1/2011	Thunderstorm Wind	\$2,000
9/6/1996	Thunderstorm Wind	\$0	5/27/2012	Thunderstorm Wind	\$5,000
9/6/1996	Thunderstorm Wind	\$0	5/27/2012	Thunderstorm Wind	\$5,000
10/18/1996	Thunderstorm Wind	\$0	6/29/2012	Thunderstorm Wind	\$5,000
5/6/1997	Thunderstorm Wind	\$0	7/7/2012	Thunderstorm Wind	\$5,000
7/18/1997	Thunderstorm Wind	\$0	7/7/2012	Thunderstorm Wind	\$5,000
5/29/1998	Thunderstorm Wind	\$0	10/29/2012	High Wind	\$0
6/16/1998	Thunderstorm Wind	\$0	5/22/2013	Thunderstorm Wind	\$5,000
6/30/1998	Thunderstorm Wind	\$0	5/22/2013	Thunderstorm Wind	\$5,000
9/7/1998	Thunderstorm Wind	\$0	6/25/2013	Thunderstorm Wind	\$5,000
6/2/1999	Thunderstorm Wind	\$10,000	6/27/2013	Thunderstorm Wind	\$5,000
7/9/1999	Thunderstorm Wind	\$15,000	7/27/2013	Thunderstorm Wind	\$2,000

Date	Type	Property Damage	Date	Type	Property Damage
7/30/1999	Thunderstorm Wind	\$10,000	5/15/2014	Thunderstorm Wind	\$1,000
8/14/1999	Thunderstorm Wind	\$10,000	5/15/2014	Thunderstorm Wind	\$2,000
9/29/1999	High Wind	\$100,000	7/3/2014	Thunderstorm Wind	\$500
1/10/2000	High Wind	\$0	7/8/2014	Thunderstorm Wind	\$10,000
4/9/2000	High Wind	\$15,000	7/13/2014	Thunderstorm Wind	\$1,000
5/13/2000	Thunderstorm Wind	\$0	8/21/2014	Thunderstorm Wind	\$500
6/2/2000	Thunderstorm Wind	\$3,000	5/16/2015	Thunderstorm Wind	\$1,000
6/21/2000	Thunderstorm Wind	\$5,000	6/8/2015	Thunderstorm Wind	\$500
12/12/2000	High Wind	\$500,000	6/8/2015	Thunderstorm Wind	\$500
2/10/2001	High Wind	\$150,000	6/8/2015	Thunderstorm Wind	\$500
4/9/2001	Thunderstorm Wind	\$0	6/8/2015	Thunderstorm Wind	\$500
6/12/2001	Thunderstorm Wind	\$0	6/12/2015	Thunderstorm Wind	\$1,000
6/12/2001	Thunderstorm Wind	\$0	8/3/2015	Thunderstorm Wind	\$2,000
6/20/2001	Thunderstorm Wind	\$0	8/3/2015	Thunderstorm Wind	\$2,000
7/1/2001	Thunderstorm Wind	\$0	8/20/2015	Thunderstorm Wind	\$1,000
7/5/2001	Thunderstorm Wind	\$0	2/24/2016	Thunderstorm Wind	\$1,000
8/28/2001	Thunderstorm Wind	\$0	4/3/2016	High Wind	\$2,000
8/30/2001	Thunderstorm Wind	\$0	6/28/2016	Thunderstorm Wind	\$1,000
8/31/2001	Thunderstorm Wind	\$0	7/25/2016	Thunderstorm Wind	\$2,000
10/16/2001	Thunderstorm Wind	\$0	7/25/2016	Thunderstorm Wind	\$2,000
3/9/2002	High Wind	\$50,000	7/19/2017	Thunderstorm Wind	\$10,000
3/21/2002	High Wind	\$25,000	8/4/2017	Thunderstorm Wind	\$0
4/28/2002	Thunderstorm Wind	\$0	8/4/2017	Thunderstorm Wind	\$0
5/12/2002	Thunderstorm Wind	\$0	8/4/2017	Thunderstorm Wind	\$0
5/31/2002	Thunderstorm Wind	\$0	8/11/2017	Thunderstorm Wind	\$4,000
2/23/2003	High Wind	\$0	8/11/2017	Thunderstorm Wind	\$4,000
7/21/2003	Thunderstorm Wind	\$0	8/12/2017	Thunderstorm Wind	\$0
7/22/2003	Thunderstorm Wind	\$0	8/19/2017	Thunderstorm Wind	\$3,000
11/13/2003	High Wind	\$50,000	8/22/2017	Thunderstorm Wind	\$0
5/15/2004	Thunderstorm Wind	\$0	3/2/2018	High Wind	\$0
5/15/2004	Thunderstorm Wind	\$0	4/4/2018	High Wind	\$0
5/18/2004	Thunderstorm Wind	\$0	5/10/2018	Thunderstorm Wind	\$4,000
6/1/2004	Thunderstorm Wind	\$0	5/15/2018	Thunderstorm Wind	\$3,000
6/17/2004	Thunderstorm Wind	\$0	5/15/2018	Thunderstorm Wind	\$4,000
8/4/2004	Thunderstorm Wind	\$0	8/7/2018	Thunderstorm Wind	\$3,000
9/17/2004	Thunderstorm Wind	\$0	8/7/2018	Thunderstorm Wind	\$6,000
9/17/2004	Thunderstorm Wind	\$0	2/24/2019	High Wind	\$0
6/6/2005	Thunderstorm Wind	\$0	5/19/2019	Thunderstorm Wind	\$10,000
6/6/2005	Thunderstorm Wind	\$0	5/19/2019	Thunderstorm Wind	\$0
7/5/2005	Thunderstorm Wind	\$0	5/23/2019	Thunderstorm Wind	\$3,000

Date	Type	Property Damage	Date	Type	Property Damage
8/13/2005	Thunderstorm Wind	\$0	5/23/2019	Thunderstorm Wind	\$10,000
5/30/2006	Thunderstorm Wind	\$0	5/29/2019	Thunderstorm Wind	\$10,000
5/30/2006	Thunderstorm Wind	\$0	6/29/2019	Thunderstorm Wind	\$4,000
6/22/2006	Thunderstorm Wind	\$0	6/29/2019	Thunderstorm Wind	\$4,000
Total Estimated Damages: \$1,277,000					

Source: National Centers for Environmental Information (NCEI), 2020

MAP 4.16



Future Occurrence

Perry County, PA has not experienced the eye wall of a hurricane, primarily due to the distance a storm would have to travel to reach the central part of Pennsylvania. As such, it is quite likely Perry County will never experience this portion of a hurricane’s anatomy within our lifetime. Tropical Storms and Nor’easters are a different story altogether.

Vulnerability Assessment

Spring and Summer Storms

Perry County is vulnerable to spring and summer storms. Hurricanes, tropical storms, and tropical depressions can also occur in this region. The difference between these types of storms is shown here. The chance of wind damage in the County increases as housing and commercial development continues. These storms can be expected from the spring to early fall months (hurricane season officially runs from June - November). The elderly and youth populations are

the most vulnerable to severe weather, due to their mobility challenges, disabilities, fixed income, etc.

Probability

There is a high probability of tropical storms and nor'easters affecting Perry County. Hurricanes however, are historically downgraded before ever reaching Perry County. This is not to say a hurricane over Perry County will never occur. The statement only serves to remind individuals we are approximately 170 miles from the Atlantic Ocean and the topography along the front edge of the Appalachian Mountains will likely have a part to play in reducing storm intensity.

Maximum Threat

Severe weather comes in many forms. Most often, instances of severe weather are regional events affecting large areas. The maximum threat to Perry County is damage to property, facilities, and infrastructure would be the result of a hurricane if one ever impacted our county.

Secondary Effect

Flooding and power outages are major secondary effects of severe weather. Heavy rain and melting snow can lead to large amounts of ground water that cannot be contained by streams and rivers. If the flooding is extreme, it may lead to dam failures. Power outages can be caused by heavy winds, strong storms, and large amounts of snow or ice melt that weigh on power lines, as well as from strains placed on power grids as they surge to meet demand. Transportation accidents are likely to increase as weather conditions deteriorate.

Flooding and traffic accidents increase the likelihood of a hazardous materials spill. Subsidence caused by flooding and extreme temperatures can damage vital lifelines such as gas and water pipelines. Essential services may experience limited disruptions and threaten the health and safety of at-risk populations in the affected area. Prolonged severe weather conditions can also have a major impact on the economic and financial condition of the County, as shortages in supplies and inflation of prices occurs.

Invasive Species and Diseases

Location and Extent

According to recent land use reports by the United States Department of Agriculture (USDA) Forest Services, Pennsylvania has more than 25,000 square miles of forest land, which comprises 59 percent of the entire Commonwealth. Because of this large amount of forest land, Pennsylvania is susceptible to the infestation of forest insects and diseases. Many insects live and feed on forest trees without harming the tree population. However, while most insects have a short life cycle and produce many offspring, almost all of the offspring die before reaching adulthood. When more than the usual number survive, an outbreak of forest insects develops. Certain species of insects, when their population reaches outbreak numbers, can cause significant damage to forests.

Range of Magnitude

According to the 2018 Pennsylvania Hazard Mitigation Plan impacts for this hazard run from being nuisance pest to that of a “widespread killer.”

Past Occurrence

Forest pests have been around for centuries. However, the outbreak of non-native pests and diseases threatens the health and lifespan of forests. According to the USDA, there are currently approximately 20 major introduced insects and eight introduced diseases attacking northeastern United States forests.

The following table content was assembled for the 2018 Pennsylvania Hazard Mitigation Plan from data collected and compiled by the Governor’s Invasive Species Council of Pennsylvania (PISC).

TABLE 4.53

**ARCHIVED INVASIVE SPECIES EVENTS WARRANTING
STATE ACTION OR QUARANTINE**

Year	Species
1911	Chestnut Blight Disease
1917	Tuberculosis
1919	European Wart Disease of the Potato
1923	Japanese Beetle
1925	European Corn Borer
1927	Canada Thistle, Field Bindweed, King-Devil, Orange Hockweed, Sow Thistle, Wild Garlic

1933	White Pine Blister
1933	Gypsy Moth
1935	Mosquitos
1953	Black Stem Rust
1983-84	Avian Influenza
1992	Pine Shoot Beetle
1996	Reptile and Amphibian Species
1999	Plum Pox Virus
2003	Black Carp, Bighead Carp, Silver Carp
2005	Eurasian Watermilfoil
2006	Chronic Wasting Disease
2006	Scrapie
2006	Vesicular Stomatitis
2007	Emerald Ash Borer
2007	Feral Pig
2008	Viral Hemorrhagic Septicemia Virus
2009	Avian Influenza
2009	Tuberculosis
2009	Emerald Ash Borer (expansion of previous quarantine)
2010	Chronic Wasting Disease, Equine Rhinopneumonitis, Lymphocytic Choriomeningitis Virus, Spring Viremia of Carp, Viral Hemorrhagic Septicemia, West Nile Encephalitis
2010	Emerald Ash Borer (expansion of quarantine to Allegheny, Armstrong, Beaver, Bedford, Butler, Indiana, Juniata, Lawrence, Mercer, Mifflin, Washington and Westmoreland Counties)
2014	Thousand Canker Disease
2014	Spotted Lanternfly

According to the Pennsylvania Department of Conservation and Natural Resources (DCNR), Pennsylvania tests approximately 17 million acres of public and private forest lands each year to determine the impact of forest pests and diseases.

The invasive Hemlock Woolly Adelgid was first detected in southeastern Pennsylvania in the late 1960s. To date, it is present in 49 of the Commonwealth's 67 counties, including Perry County. According to DCNR, the severity of the Hemlock Woolly Adelgid infestation is high in Perry County. The Commonwealth does use a chemical treatment to suppress the infestation of the Hemlock Woolly Adelgid.

Gypsy Moths are also monitored in Pennsylvania. According to DCNR, Gypsy Moths were responsible for the defoliation of more than 680,000 acres in 2007. Suppression programs were utilized in 29 of the Commonwealth's 67 counties, including Perry County, in 2007. According to DCNR, 75 percent of the treated areas sustained less than 30 percent defoliation.

TABLE 4.54

**MAJOR INTRODUCED INSECTS AND DISEASES IN
NORTHEASTERN UNITED STATES FORESTS**

Insect	Origin	Year Introduced
Elm Leaf Beetle	Europe	1834
Gypsy Moth	Europe	1869
Larch Sawfly	Eurasia	1880
Larch Casebearer	Europe	1886
Beech Scale	Eurasia	1890
Pear Thrips	Europe	1904
Balsam Woolly Adelgid	Europe	1908
Smaller Elm Bark Beetle	Europe	1909
Eur. Pine Sawfly	Europe	1914
Birch Leafminer	Europe	1925
Int. Basswood Thrips	Europe	1925
Red Pine Scale	Europe	1946
Hemlock Woolly Adelgid	Europe	1953
Larger Pine Shoot Beetle	Europe	1992
Asian Gypsy Moth	Europe/Asia	1992
Europ. Spruce Bark Beetle	Europe	1993
Asian Longhorned Beetle	Asia	?
Beech Bark Disease	Europe	1890
Chestnut Blight	Asia	1904
White Pine Blister Rust	Europe	1906
Larch Canker	Europe	1927
Dutch Elm Disease	Europe	1930

Butternut Canker	Asia	1960
Sclerodermis Canker	Europe	1930
Dogwood Anthracnose	Japan	1976
Emerald Ash Borer	Asia	2002
Spotted Lanternfly	China, India and Vietnam	2014

Source: PA Department of Conservation and Natural Resources

Future Occurrence

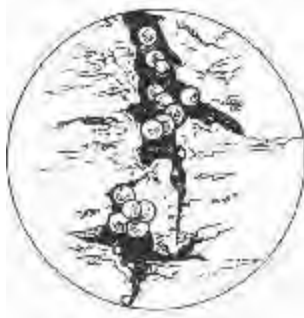
Invasive species are increasingly growing in concern from the destruction they cause to sustain themselves to the habitats they steal from native species. Awareness and preparedness to defend against these invaders will determine the resulting impacts for unwanted future incursions yet to come. The PISC has identified the following as invasive species to be concerned about.

**TABLE 4.55
INVASIVE SPECIES OF CONCERN**

Amphibians and Reptiles	Red-Eared Slider, and Yellow-bellied Slider
Fishes, Diseases and Invertebrates	
Mammals and Birds	
Submerged Aquatic Plants	
Terrestrial Aquatic Plants	
Human and Animal Pathogens	
Plan Pathogens	
Birds	European Starling, House Sparrows, Monk Parakeet, and Pigeons
Insects and Other Invertebrates	
Higher Mammals	Feral Swine, House Mouse, Norway Rat, and 13-Lined Ground Squirrel
Vascular Plants	

Vulnerability Assessment

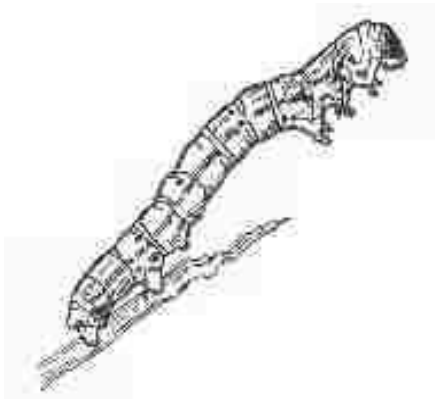
DCNR lists 17 important insects and diseases in Pennsylvania. These pests can also be a nuisance to people who live, work, and recreate in the forestland. The following pages further explain each of the 17 important forest pests and diseases in Pennsylvania as outlined by DCNR.

Beech Bark / Beech Scale Complex

Beech bark disease is a canker disease caused by the *Nectria* fungus. Entry of the pathogen is facilitated by the beech scale insect in which the scale insect inserts a stylet (needle-like mouthpart) into the bark and into the underlying live tissues where sugars and other nutrients are sucked into the insect. These wound sites are available for colonization by the *Nectria* fungus, which produces spores that are transported passively by insects or wind. Under the right conditions, spores germinate and enter wounds created by the scale insect.

Eastern Tent Caterpillar

The Eastern Tent Caterpillar constructs web nests in the forks of branches on black cherry, apple, and crabapple trees in the early spring. Overwintering eggs hatch in late April. Caterpillars are full grown by late May or early June. These caterpillars can become a nuisance when they migrate in search of foliage or pupation sites. The caterpillars are hairy, mostly dark with a white line down the middle of the back, five centimeters or more in length when fully grown. Pupation occurs in a cream-colored, oval cocoon. Adults emerge in late June or early July. The female moth lays eggs in a single layer encircling twigs of favorite hosts. A layer of black, spongy material covers the eggs. There is one generation a year.

*Fall Cankerworm*

The Fall Cankerworm crawls up nearby objects (usually a tree) to mate and lay eggs on the trunk and twigs. Males are mostly gray, with a wingspan of 2.5 centimeters. The small cylindrical eggs are laid in single-layer masses. Eggs hatch at budbreak, and the young caterpillars crawl to new foliage to feed. Favorite host trees are maple, beech, apple, hickory, basswood, and oak. Larvae are hairless and vary between green with a darker green stripe down the back, to mostly black with a black stripe. Besides the three pairs of legs on the thorax, there are three pairs of primitive legs at the hind end. Larvae feed for about one month and attain a length of about two centimeters before spinning down to the ground.

Forest Tent Caterpillars

The Forest Tent Caterpillar feeds on maples, beeches, aspens, and oaks as well as other hardwoods. It is a native insect and can be found throughout eastern North America. There have been several population outbreaks in the last 100 years, occurring at approximately 12-year intervals. When defoliation by forest tent caterpillars is severe and trees are stressed by other factors, such as drought or leaf anthracnose, inordinate tree mortality can be the consequence. Caterpillars and pupae are attacked by many parasites and some diseases.



Hemlock Woolly Adelgid



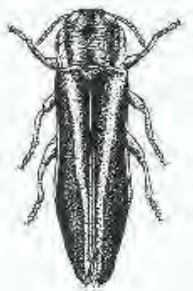
The Hemlock Woolly Adelgid feeds on hemlock, the Pennsylvania state tree, and can become numerous enough to stress ornamental and naturally growing trees, particularly those already suffering from drought, defoliation, or some such antagonist. The Hemlock Woolly Adelgid was first found in the eastern United States in Virginia in 1956 and Pennsylvania by 1969. It has few natural enemies in the eastern United States, although some lady beetles feed on them. The overall impact by the Hemlock Woolly Adelgid in Pennsylvania has not been great except where drought or defoliation by the hemlock looper has caused trees to be severely stressed.

Leafrollers

There are about two dozen species of caterpillars, a couple species of weevils, and at least one species of wasp larvae which fold over parts of leaves or tie together adjacent leaves, thus forming a protected area in which to rest and feed. In Pennsylvania, an outbreak of the oak leafroller was detected in 1967, and at its peak, defoliation was visible on about one million acres. The outbreak collapsed in 1975. By that time over 60 million oak trees were killed as a result of stress from defoliation and subsequent attack by beetles and fungi.



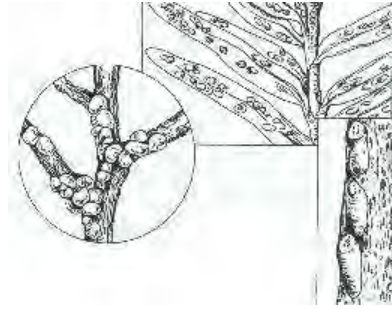
Twolined Chestnut Borer



The Twolined Chestnut Borers are active for about two weeks in early summer. American chestnut was the primary host before chestnut blight killed most chestnut trees in the first half of the 1900s. Since then, oaks have been the preferred hosts. Trees stressed by drought, insect defoliation, and damage to the roots are more likely to be successfully attacked by this beetle. Therefore, damage by this beetle is best limited by reducing stress on the oak trees.

Scale Insects

There are over 6,000 species of scale insects in the world. Each species feeds on one or a few species of trees or herbaceous plants. Sometimes scales become very numerous on their host and severely weaken or kill the host. Therefore, many scale insect species are important pests in agriculture, horticulture, and forestry.



White Pine Weevil



Weevils are destructive beetles, with chewing mouthparts at the end of a snout. Adult White Pine Weevils feed on various parts of pine and spruce trees until late fall. After a leader dies as a consequence of larval feeding, one of the branches of the whorl below the killed leader becomes dominant and forms the future trunk. The result is a tree with a permanent crook, thereby reducing the value of the butt log and making the tree unsightly for ornamental plantings or Christmas trees.

Spruce Gall Adelgids

There are two species of Adelgids that are problematic due to the galls they cause on spruce. Of these two, the most commonly observed species in Pennsylvania is the Eastern Spruce Gall Adelgid. This species is native to Europe and is common on Norway spruce. The Adelgids' feeding causes the formation of pineapple-shaped galls at the base of twigs. The Adelgids continue to feed and develop within the galls until late summer, when the cells of the gall open up. The emerging nymphs transform to winged adults in a couple of days.



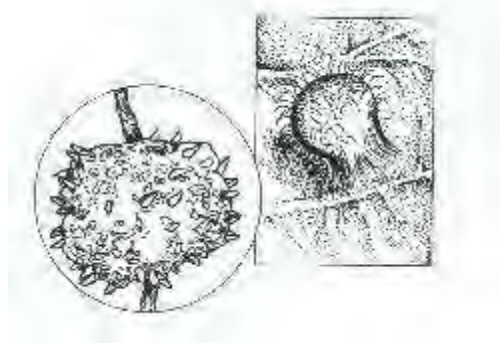
Maple Anthracnose



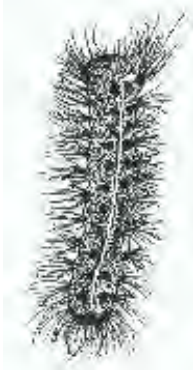
Maple Anthracnose is usually observed in the spring as young, succulent leaf tissue emerging during warm, moist periods and causing leaf, twig, and blight and, occasionally, branch dieback. Tree death in a northern hardwood stand normally ranges from one percent to three percent, but in 1995, tree death increased in many affected stands to 11 percent or higher. This combination of an insect outbreak followed by a disease outbreak in the short term occurs from time to time and can be destructive to our forests. Many trees do survive, however, and these genetically superior individuals form the basis for a new and more pest-resistant forest community.

Leaf Galls

Leaf galls are deformations of plant foliage that occur in response to feeding or other stimulus by foreign organisms. Galls are formed in a wide array of shapes, sizes, and colors. Feeding of an insect or mite causes plant cells to die, but surrounding cells continue to grow, resulting in a cell in which the larva develops. Most gall-causing organisms feed on only one host species or genus, and the gall may be distinct for that species. Usually, leaf galls are not numerous enough to substantially disrupt the food-making capacity of the leaves.



Gypsy Moth

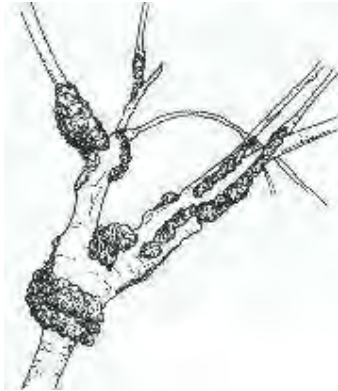


The Gypsy Moth gets its name from a behavior of its larger caterpillars, which generally migrate each day from the leaves and down the branches and trunk to rest in shaded spots on the tree or objects on the ground. It is fairly easy to identify Gypsy Moths because the colors of caterpillars, adults, and egg masses are so distinct. Caterpillars favor oak but will feed on the foliage of many tree species, including some conifers. However, there are some trees, such as ash, tulip poplar, dogwood, and black locust, on which they will not feed. Defoliation by caterpillars of Gypsy Moth weakens trees, because without leaves the trees are not able to manufacture food.

Fall Webworm

Fall Webworms construct web nests in trees late in summer. They overwinter as pupa under leaf litter. In southern Pennsylvania there are two generations; the early summer generation is usually not numerous and therefore inconspicuous. Moths are white and medium size. In southeast Pennsylvania, females of the second generation lay eggs on the underside of leaves in late July. They have been most numerous on black cherry, walnut, hickory, and mulberry. Some years they are numerous enough to completely defoliate trees. Favored tree species growing in areas of poor air drainage and ample light exposure are defoliated more heavily. Damage is usually not significant because by the time the trees are fed on by fall webworm, they have already produced and stored the energy resources needed for their survival and growth.

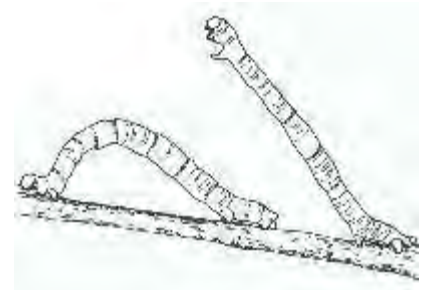


Black Knot of Cherry

This fungus causes black warty growths on branches of cherry, plum, and occasionally apricot and peach trees. Branches become infected when windblown spores from previously formed galls are deposited on the current year's stems. Symptoms of infection may be visible late the same year but become much more visible during the next growing season. Initially, the warty growths are olive green but later turn black. In the spring of the second year following infection, the "knots" produce spores, which infect other sites on twigs. After spore release, the dead "knots" persist on the infected branches. To reduce chance of infection, prune out and burn "knots" during the winter or in early spring before budbreak.

Elm Spanworm

The Elm Spanworm is one of the inchworms that feed on northern hardwoods. This insect is capable of becoming very numerous and causing heavy defoliation over vast areas. Natural control usually occurs as a result of egg parasitism.

*Armillaria Root Disease*

This disease is caused by a group of mushroom-like fungi in the genus *Armillaria*, which typically live on dead plant tissue in soil. *Armillaria* fungi have the capability of causing a disease of roots and lower stem tissue on many species of woody plants, including conifer and broadleaf trees, throughout the temperate and tropical regions of the world. There is no control of this disease because *Armillaria* is widely distributed and can grow and survive on dead wood buried in soil. Trees that are in good health and growing vigorously are less susceptible to *Armillaria* root disease.

Probability

According to the County's Comprehensive Plan, more than 62 percent of Perry County is forest land. The probability of forest pests and diseases affecting Perry County is high. However, the impact of this is relatively low, unless there is extensive infestation. Observation and monitoring should track the health of the forest land and the impacts these pests and diseases are having. Pennsylvania has seen a reduction in certain tree species due to pest infestations.

Maximum Threat

The maximum threat of insect infestation in Perry County forest land occurs when infestation is combined with other stressors such as pollution, insect defoliation, competition with other trees, and drought.

Certain pests and diseases have a severe impact on the health of the forest. Pennsylvania is currently monitoring the Emerald Ash Borer, a beetle native to Asia that attacks ash trees. It was first found in the United States in Michigan in 2002, and since has been responsible for the destruction of more than 25 million ash trees, according to DCNR. Currently, the Emerald Ash Borer has been detected in four counties in western Pennsylvania: Allegheny, Beaver, Butler, and Lawrence. Testing has taken place in Perry County; however, the Emerald Ash Borer has not been detected.

Secondary Effects

There are many secondary effects of the infestation of forest pests and diseases. Forests prevent soil degradation and erosion, protect watersheds and stabilize mountainous areas, and limit the greenhouse effect by absorbing carbon dioxide. Forests serve as natural habitats to many of earth's species and therefore are a key component of biodiversity. The loss of forest land can cause a decline in the population of many woodland species. Also, forests play a critical role in the hydrologic system. A decline in woodland can increase erosion and expand the effects of flooding. Forests are also a major economic factor in Pennsylvania, because they are a direct source of energy and raw materials.

Lightning

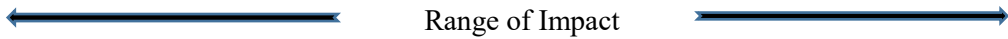
Location and Extent

Lightning affects the entire Commonwealth and can be expected any time of the year. A real-time lightning map of the world can be accessed at the following URL:
<https://www.lightningmaps.org/?lang=en#m=oss;t=3;s=0;o=0;b=;ts=0;>

Range of Magnitude

TABLE 4.56

LIGHTNING RANGE OF POTENTIAL DAMAGE

 Range of Impact				
Low	Low - Medium	Medium	High	Severe
Local Power Outage	Regional Power Outage	Pet or Livestock struck and killed	Individual struck injured or killed	Group of people stuck injured or killed

Past Occurrence

Every year, Perry County experiences severe spring and summer storms with associated lightning. These storms have an immediate impact, as well as longer lasting secondary effects. Over the past 30 years, these storms have caused significant damage. The 2018 Pennsylvania Hazard Mitigation Plan does not include mention of any lightning events as part of its table listing of Presidential or Gubernatorial disaster emergency declarations. Lightning strikes may occur as part of a severe storm or thunderstorm, which is profiled earlier in this chapter. Table 4.54 may provide an indication as to when lightning strikes have occurred during thunderstorms, but lightning strikes are not captured through the NOAA NCEI Storm Events Database.

Future Occurrence

According to the Pennsylvania Climate Impacts Assessment Update conducted in May of 2015, “thunderstorm... are projected to increase in frequency as a result of climate change...” If the forecast is correct, this increase will be accompanied by an increase in the frequency of lightning events.

Vulnerability Assessment

Perry County is vulnerable to severe winter weather. The economic impacts from snow removal, road and infrastructure repair, etc. impart a great strain on the budgets and material resources of local municipalities. Along with municipalities, other vulnerable entities in the County include business and utility companies. Drivers experience automobile accidents while homeowners experience property damage. Municipalities are burdened with snow and ice removal,

businesses are constantly losing income from closures, and utility companies are tasked with repairing the damage done to critical infrastructure (fallen power lines, water main breaks, etc.).

Spring and Summer Storms

Perry County is vulnerable to spring and summer storms. Hurricanes, tropical storms, and tropical depressions can also occur in this region. The difference between these types of storms is shown here. The chance of wind damage in the County increases as housing and commercial development continues. These storms can be expected from the spring to early fall months (hurricane season officially runs from June - November).

Probability

There is a high probability of severe weather affecting Perry County. Hurricanes and tropical storms, heavy fog, high winds, unseasonable temperatures, and winter weather all affect Perry County.

Maximum Threat

Severe weather comes in many forms. Most often, instances of severe weather are regional events affecting large areas. The maximum threat to Perry County is damage to property, facilities, and infrastructure as a result of severe weather.

Secondary Effect

Electrocution can occur when being electrocuted can lead to severe burns where the electricity arcs or acts between a body and the ground. The burns can be so severe death may ensue.

Other considerations include both urban fires and wildfires. Both can be triggered by lightning.

Pandemic (Health Emergency)

Location and Extent

A pandemic is a disease that attacks or affects the population of an extensive area. For further clarity, epidemics could be considered more regional where pandemics are much greater in size with far reaching. This can be an entire country or continent. Each year, different strains of influenza are labeled as potential pandemic threats, for example. Although recently brought under control, Severe Acute Respiratory Syndrome (SARS) has shown the potential of becoming a pandemic. Neither the World Health Organization nor the Center for Disease Control and Prevention (CDC) has classified SARS. The following diseases have the potential to infect Perry County.

West Nile Virus (WNV)

This virus is usually spread by mosquitoes. A mild case will mimic the flu, while severe cases are life threatening. No drugs or vaccines are available to treat West Nile Virus, however, most people fully recover from it. In more severe cases, intensive supportive therapy is indicated, often involving hospitalization, intravenous fluids, airway management, respiratory support (ventilator), prevention of secondary infections (pneumonia, urinary tract), and good nursing care.

Influenza

On average, 10-20 percent of the United States population will contract the flu by person-to-person contact each year. This is commonly a result of respiratory droplets released during coughing and sneezing. Some of these influenza cases will be fatal. Each year, the flu causes the loss of approximately 36,000 American lives. This disease has the ability to suddenly affect all age groups on a global scale. The elderly, small children, those with weakened immune systems, and those affected by other illnesses are especially susceptible. “Avian Influenza” is a version of the flu that affects birds and is transmitted most commonly to humans by birds or through an intermediate host.

Hepatitis

Hepatitis is a disease affecting the liver. Hepatitis is usually spread by person-to-person contact. The different types of hepatitis are explained below.

- Hepatitis A (HAV) – a liver disease that can affect anyone
- Hepatitis B (HBV) – caused by a virus that attacks the liver, this virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death
- Hepatitis C (HCV) – a liver disease, which is found in the blood of those infected. HCV is spread by contact with the blood of an infected person.


Chronic Wasting Disease

According to the Centers for Disease Control (CDC), Chronic Wasting Disease (CWD) is an endemic in Colorado, Wyoming, and Nebraska. New areas of focus have also developed in deer

and elk herds across the United States. CWD is classified as a transmissible spongiform encephalopathy, or prion disease. The only known natural hosts are deer and Rocky Mountain elk.

Range of Magnitude

TABLE 4.57
IMPACTS OF DISEASE SPREADING

			
Low	Medium	High	Severe
Farm-scale	Community	Epidemic	Pandemic

Past Occurrence

West Nile Virus

According to the Centers for Disease Control and Prevention (CDC), West Nile Virus infected a reported 237 humans in Pennsylvania, resulting in eight deaths, in 2003. In an attempt to monitor any outbreak of the virus, the Perry County Conservation District administers the County’s West Nile tracking program. The tracking program tests all of Perry County for the West Nile Virus by setting approximately 15 traps weekly which catch both egg-laying mosquitoes and biting mosquitoes. Trapped mosquitoes are sent to a Pennsylvania Department of Environmental Protection (DEP) lab in Harrisburg, PA for testing. There were no positive test results in 2007, and none as of May, 2008. However, guidelines are in place should a positive test result be received.

Influenza

During the 20th Century, the emergence of several new Influenza A virus subtypes caused three pandemics, all of which spread around the world within a year of being detected.

- 1918-1919 “Spanish flu” [A (H1N1)] caused the highest number of known influenza deaths. More than 500,000 people died in the United States, and up to 50 million people may have died worldwide. Many people died within the first few days after infection, and others died of secondary complications. Nearly half of those who died were young, healthy adults. Influenza A (H1N1) viruses still circulate today, after being introduced again into the human population in 1977.
- 1957-1958 “Asian flu” [A (H2N2)] caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.

- 1968-1969 “Hong Kong flu” [A (H3N2)] caused about 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year. Influenza A (H3N2) viruses still circulate today.

Both the 1957-1958 and 1968-1969 pandemics were caused by viruses containing a combination of genes from a human influenza virus and an Avian Influenza virus. The 1918-1919 pandemic virus also appears to have had an avian origin.

Pennsylvania’s \$600 million poultry industry lost \$70 million from 1983-1984 as a result of an avian flu outbreak.

Mad Cow Disease

Bovine Spongiform Encephalopathy (BSE) is commonly called “Mad Cow Disease.” It is a fatal brain disease that occurs in livestock. In human cases, it is referred to as Creutzfeldt-Jakob Disease, or CJD. It can be acquired in humans by consuming the meat of an infected animal.

In 1997, a ban was established by the U.S. Department of Agriculture (USDA) on the importation of live animals or animal products from countries with the disease. According to the U.S. Department of Agriculture, Perry County had 28,400 cattle located throughout the County’s farms in 2007. Of course, when considering this vulnerability, it must be acknowledged that residents still have the ability to purchase imported beef from areas outside the County.

Hepatitis

In 2003, the Pennsylvania Department of Health and the CDC investigated an outbreak of Hepatitis A among patrons of a national chain restaurant in western Pennsylvania. Approximately 555 persons with Hepatitis A were identified, including at least 13 food service workers and 75 residents of six other states who dined at the restaurant. Preliminary analysis of a case-control study implicated green onions as the source of the outbreak. Hepatitis A can be contracted by eating food which was handled by infected workers at some point in the food processing chain, or which was not properly cleaned.

Department of Health

http://www.dsf.health.state.pa.us/health/lib/health/guide/NOTIFIABLE_DISEASES.html

Chronic Wasting Disease

CWD was first identified in wild herds in 1981 in Colorado. Throughout the 1990’s, CWD was diagnosed in deer and elk herds in northeastern Colorado and southeastern Wyoming. By 2000 the disease had also been identified in Nebraska, seemingly spreading throughout the tri-corner area of the three states. The effects on humans are not known at this time. The PA State Game Commission has put protections in place requiring deer testing, in order to mitigate against the potential for human consumption of such diseased animals.

Future Occurrence

Each year it seems as if the world is experiencing an epidemic of some sort. Social media has amped up the awareness factor, but the simple fact is life destroying diseases exist year in and out. Some viruses have mutated to avoid their demise at the hands of pharmaceutical stalwarts with ambitions of eradicating such pestilence.

Vulnerability Assessment

West Nile Virus

According to the Pennsylvania West Nile website, the virus is not present in Perry County.

Influenza¹⁴

An influenza pandemic is a global outbreak of disease that occurs when a new Influenza A virus appears or “emerges” in the human population, causes serious illness, and spreads easily among people worldwide. Pandemics are different from seasonal outbreaks or “epidemics” of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that already circulate among people, whereas pandemic outbreaks are caused by new subtypes, by subtypes that have never circulated among people, or by subtypes that have not circulated among people for a long time. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

Appearance (Emergence) of Pandemic Influenza Viruses

There are many different subtypes of influenza or “flu” viruses. Pandemic viruses emerge as a result of a process called “antigenic shift,” which causes an abrupt or sudden, major change in Influenza A viruses. The appearance of a new Influenza A virus subtype is the first step toward a pandemic. However, to cause a pandemic, the new virus subtype also must have the capacity to spread easily from person to person. Once a new pandemic influenza virus emerges and spreads, it usually becomes established among people and circulates for many years as seasonal epidemics of influenza. The U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have large surveillance programs to monitor and detect influenza activity around the world, including the emergence of possible pandemic strains of influenza virus.

Vaccines to Protect Against Pandemic Influenza Viruses

A vaccine probably would not be available in the early stages of a pandemic. When a new vaccine against an influenza virus is being developed, scientists around the world work together to select the virus strain that will offer the best protection against that virus. Manufacturers then use the selected strain to develop a vaccine. Once a potential pandemic strain of influenza virus is identified, it takes several months before a vaccine becomes widely available. If a pandemic occurs, the U.S. government will work with many partner groups to make recommendations guiding the early use of available vaccine.

¹⁴ www.CDC.gov, December 2005.

Antiviral Medications to Prevent and Treat Pandemic Influenza

Four different influenza antiviral medications (Amantadine, Rimantadine, Oseltamivir, and Zanamivir) are approved by the U.S. Food and Drug Administration (FDA) for the treatment and/or prevention of influenza. All four usually work against Influenza A viruses. However, the drugs may not always work, because influenza virus strains can become resistant to one or more of these medications. For example, the Influenza A (H5N1) viruses identified in humans in Asia in 2004 and 2005 have been resistant to Amantadine and Rimantadine. Monitoring of avian viruses for resistance to influenza antiviral medications continues.

Preparing for the Next Pandemic

Many scientists believe it is only a matter of time until the next influenza pandemic occurs. The severity of the next pandemic cannot be predicted, but modeling studies suggest the impact of a pandemic on the United States could be substantial. In the absence of any control measures (vaccination or drugs), it has been estimated that in the United States, a “medium-level” pandemic could cause 89,000-207,000 deaths, 314,000-734,000 hospitalizations, 18-42 million outpatient visits, and another 20-47 million sick people. Between 15-35 percent of the U.S. population could be affected by an influenza pandemic, and the economic impact could range between \$71.3 - \$166.5 billion.

Influenza pandemics are different from many of the threats for which public health and health-care systems are currently planning. A pandemic will last much longer than most public health emergencies, and may include “waves” of influenza activity separated by months. In 20th Century pandemics, a second wave of influenza activity occurred 3-12 months after the first wave). The numbers of health care workers and first responders available to work will likely be reduced; they will be at high risk of illness from exposure in the community and in health care settings. Some may have to miss work to care for ill family members. Resources in many locations could be limited, depending on the severity and spread of an influenza pandemic.

Because of these differences and the expected size of an influenza pandemic, it is important to plan preparedness activities that will permit a prompt and effective public health response. The U.S. Department of Health and Human Services (HHS) supports pandemic influenza activities in the areas of surveillance (detection), vaccine development and production, strategic stockpiling of antiviral medications, research, and risk communications. In May 2005, the U.S. Secretary of HHS created a multi-agency National Influenza Pandemic Preparedness and Response Task Group. This unified initiative involves CDC and many other agencies (international, national, state, local, and private) in planning for a potential pandemic. Its responsibility includes revision of a U.S. National Pandemic Influenza Response and Preparedness Plan.

Avian Influenza (Bird Flu - Avian Influenza in Birds)

This is general information about Avian Influenza (bird flu) and information about one type of bird flu, called Avian Influenza A (H5N1) that has caused infections in birds in Asia and Europe, and in humans in Asia.

Avian Influenza is an infection caused by Avian (bird) Influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, Avian Influenza is very contagious among birds and can make some domesticated birds very sick or cause death.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions on surfaces that are contaminated from infected birds. Domesticated birds may become infected with Avian Influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

Infection with Avian Influenza viruses in domestic poultry causes two main forms of disease, distinguished by low and high extremes of virulence. The “low pathogenic” form may go undetected and usually causes only mild symptoms (such as ruffled feathers and a drop in egg production). However, the highly pathogenic form spreads more rapidly through flocks of poultry. This form may cause disease that affects multiple internal organs and has a mortality rate that can reach 90-100 percent, often within 48 hours.

Outbreaks of Avian Influenza H5N1 occurred among poultry in eight countries in Asia (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam) during late 2003 and early 2004. At that time, more than 100 million birds in the affected countries either died from the disease or were killed to control the outbreaks. By March 2004, the outbreak was reported under control. Since late June 2004, however, new outbreaks of Influenza H5N1 among poultry were reported by several countries in Asia (Cambodia, China [Tibet], Indonesia, Kazakhstan, Malaysia, Mongolia, Russia [Siberia], Thailand, and Vietnam). It is believed these outbreaks are ongoing. Influenza H5N1 infection also has been reported among poultry in Turkey, Romania, and Ukraine. Outbreaks of Influenza H5N1 have been reported among wild migratory birds in China, Croatia, Mongolia, and Romania.

There are many migratory birds that travel through Pennsylvania. Waggoner’s Gap, located on the Kittatinny Ridge, near Cumberland and Perry County, is identified as Important Bird Area #51 by the Audubon Society of Pennsylvania. Volunteer counters recorded more than 21,000 migrating raptors during the fall 2005 migration season. The hawk species included: Black Vultures, Turkey Vultures, Bald Eagles, Northern Harriers, Sharp-shinned Hawks, Cooper’s Hawks, Northern Goshawks, Red Shouldered Hawks, Broad-winged Hawks, Red-tailed Hawks, Rough-legged Hawks, Golden Eagles, American Kestrels, Merlins, Peregrine Falcons, and other unidentified raptors.

The Wild Bird Feeding Industry Research Foundation states that while wild birds are capable of carrying the virus, in most cases the virus spreads to new locations through the transportation of infected poultry and poultry products. Further, the Research Foundation states that it’s safe to watch wild birds in North America, as well as to feed them, and attract them to your yard.¹⁵

¹⁵ Wild Bird Feeding Industry (www.wbfi.org)

Human Infection with Avian Influenza Viruses

The risk from Avian Influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of Avian Influenza infection have been reported since 1997. Most cases in humans have resulted from contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretion/excretions from infected birds. The spread of Avian Influenza viruses from one ill person to another has been reported very rarely, and transmission has not been observed beyond one person.

“Human Influenza” virus usually refers to those subtypes that spread widely among humans. There are only three known A subtypes of influenza viruses (H1N1, H1N2, and H3N2) currently circulating among humans. It is likely that some genetic parts of current Human Influenza A viruses came from birds originally. Influenza A viruses are constantly changing and might adapt over time to infect and spread among humans.

During an outbreak of Avian Influenza among poultry, there is a possible risk to people who have contact with infected birds or surfaces that have been contaminated with secretions or excretions from infected birds. The table that follows illustrates the chicken population and egg production for Perry County between 1978-1992.

Symptoms of Avian Influenza in humans have ranged from typical Human Influenza-like symptoms (fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other severe and life-threatening complications. The symptoms of Avian Influenza may depend on which virus caused the infection.

Studies done in laboratories suggest that the prescription medicines approved in the United States for Human Influenza viruses should work in treating Avian Influenza infection in humans. However, influenza viruses can become resistant to these drugs, so these medications may not always work. Additional studies are needed to demonstrate the effectiveness of these medicines.

Human Health Risks During the H5N1 Outbreak

The H5N1 virus does not usually infect people, but more than 140 human cases have been reported by the World Health Organization since January 2004. Human cases of Influenza A (H5N1) infection have been reported in Cambodia, China, Indonesia, Thailand, and Vietnam. For the most current information about Avian Influenza and cumulative case numbers, see the World Health Organization (WHO) website at http://www.who.int/csr/disease/avian_influenza/en/. Most of these cases have occurred as a result of people having direct or close contact with infected poultry or contaminated surfaces; however, a few cases of human-to-human spread of H5N1 have occurred.

Of the few Avian Influenza viruses that have crossed the species barrier to infect humans, H5N1 has caused the largest number of detected cases of severe disease and death in humans. In the current outbreaks in Asia and Europe, more than half of those infected with the virus have died. Most cases have occurred in previously healthy children and young adults. However, it is

possible that the only cases currently being reported are those in the most severely ill people, and that the full range of illness caused by the H5N1 virus has not yet been defined.

So far, the spread of H5N1 virus from person to person has been rare and has not continued beyond one person. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned H5N1 virus eventually could be able to infect humans and spread easily from one person to another. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic (worldwide outbreak of disease) could begin.

No one can predict when a pandemic might occur. However, experts around the world are watching the H5N1 situation in Asia and Europe very closely, and are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

Treatment and Vaccination for H5N1 Virus in Humans

The H5N1 virus that has caused human illness and death in Asia is resistant to Amantadine and Rimantadine, two antiviral medications commonly used for influenza. Two other antiviral medications, Oseltamavir and Zanamavir, would probably work to treat influenza caused by H5N1 virus, but additional studies need to be done to demonstrate their effectiveness.

Currently there is not a commercially available vaccine to protect humans against H5N1 virus seen in Asia and Europe. However, vaccine development efforts are taking place. Research studies to test a vaccine to protect humans against H5N1 virus began in April 2005, and a series of clinical trials is underway.

Eastern Equine Encephalitis (EEE)

During the writing of this plan, a relatively new virus found its way to the public airwaves reach the evening news. The virus is glamorously referred to as triple E. In reality there is nothing glamorous about a sleeping sickness. There is a very high mortality rate with this disease, which causes swelling on the brain. The disease has been found to be spread by mosquito.

Hepatitis

Vulnerability to Hepatitis viruses is basically the same around the country. The keys to avoiding Hepatitis are vaccinations, good hygiene, and common sense. Adequate sanitation and clean personal habits will help reduce the spread of Hepatitis A and Hepatitis B. In areas where sanitation is questionable, water should be boiled, food should be cooked, and fruit should be peeled.

Chronic Wasting Disease

According to the CDC, CWD has not been identified in free-ranging deer herds in Pennsylvania. However, according to the Pennsylvania Game Commission, efforts to detect CWD in the state began in 1998. In September of 2005, the Game Commission, Governor's Policy Office,

Department of Agriculture, Department of Health, Department of Environmental Protection, Pennsylvania Emergency Management Agency and U.S. Department of Agriculture completed a response plan to prevent CWD from entering our borders and, in the event CWD is found in the state, to detect, contain and work to eradicate the disease. Public health officials recommend that human exposure to the CWD agent be avoided, however, no evidence that CWD affects humans has been found.

Swine Flu

Is the name assigned to a type of influenza virus which affects pigs. There was a global outbreak as recently as 2009-2010. African Swine Flu is a recently discovered deadly strain raising great concern in the farming community

Probability

Currently, the probability of a widespread public health emergency occurring in Perry County is relatively low, with a frequency of every 30 years or less; however there exists the potential for the H5N1 virus to increase the probability of a public health emergency to affect Perry County in the future. Instances can vary greatly in the degree of severity. Minor outbreaks of less serious communicable diseases and viruses, such as seasonal influenza, occur more frequently.

Maximum Threat

Public health emergencies typically occur on a regional basis. Sources include infected animals, contaminated food, and improperly prepared food. While all of Perry County is vulnerable to a public health emergency, the likely source of a severe infection may be a farm or restaurant. In the event of a large scale public health emergency, such as with a potential pandemic, the maximum threat to the County lies in dense population concentrations, and in outlying commercial agricultural operations with dense populations of cattle, fowl and swine. The health and safety of persons in the affected area and the sustainability of existing economic and financial conditions are at greatest risk.

Secondary Effects

The secondary effects of a public health emergency can vary from minimal to severe. In the event of a limited or easily contained public health emergency, such as season influenza or hepatitis, the County may experience nominal disruption to government functions and industry commodities and services. Social impacts and environmental impacts could also be nominal. In the event of a widespread public health emergency, such as in the event of pandemic influenza, the secondary effects will be severe. There will be a high level of absenteeism and staffing shortages among the County's workforce at all levels and across all occupations. Critical services, such as public safety, public health, and government functions, will be greatly reduced. Severe disruption of utilities, transportation, and commerce will occur. Travel restrictions and business closures may occur. Agri-business could suffer as the result of widespread culling, quarantines, and bans. The resulting economic and social impacts will be very high.

Handling the disposal of diseased animals is critical to protecting the public's health.

Winter Storm, Blizzard, or Ice Storm

Location and Extent

Severe weather affects the entire Commonwealth and can be expected any time of the year. Severe weather for Perry County is considered to include: blizzards and/or heavy snowfall, heavy fog, hail, heavy precipitation (rain), high winds, ice storms, unseasonable temperature extremes, hurricanes, and severe thunderstorms. (Tornados will be discussed in a separate profile.)

Snowstorms occur approximately five times per year. These storms are more prevalent in the northern and western regions of Pennsylvania and include ice and high wind. They are frequently seen in Perry County.


Hurricanes, tropical storms, and windstorms occur in Perry County in the spring and summer. Most hurricanes that approach Perry County are downgraded to tropical storms or tropical depressions by the time they reach central Pennsylvania. Heavy rain and flooding produced by a hurricane, tropical storm, or tropical depression will have the greatest impact on the County.

Extreme temperatures can be devastating to any area. Extreme heat can cause sunburn, heat cramps, heat exhaustion, and heat/sun stroke. Likewise, extreme cold can cause hypothermia and frost bite.

Range of Magnitude

TABLE 4.58

IMPACTS OF WINTER STORMS

				
Low	Low-Medium	Medium	High	Severe
Freezing Rain	Sleet	Snow	Squall	Blizzard

Past Occurrence

Perry County, as well as the entire Commonwealth, is vulnerable to a wide range of natural disasters. Typically, these disasters are caused by severe weather. A summary of disaster declarations since 1996 from severe weather that affected Perry County can be seen below.

TABLE 4.59

DISASTER DECLARATIONS IMPACTING PERRY COUNTY

Winter Storms	Blizzards	Hurricanes/ Tropical Storms	Floods	Droughts
January, 1966	February, 1978	Agnes, June, 1972	Flood (Eloise), September, 1975	July, 1991
February, 1972	March, 1993	Windstorm, April, 1975	October, 1976	July, 1999
January, 1978	–	Floyd, September, 1999	January, 1996	February, 2002
January, 1994	–	Hurricane Isabel/Henri, September, 2003	September, 1996	–
January, 1996	–	Tropical Depression Ivan, September, 2004	June, 2006	–
February, 2003	–	Hurricane Katrina, September, 2005	–	–

Source: National Climatic Data Center

Winter Storms

Perry County is vulnerable to an array of winter weather. This weather has the ability to close businesses, close schools, and block or damage roadways in the County. Perry County has been included in several statewide emergency declarations because of significant snow and ice accumulation and the resulting floods, which are common secondary effects. The annual snowfall is depicted here. According to the National Weather Service, Perry County sees an average of 40 inches of snow per year.

The following table defines various winter weather conditions:

TABLE 4.60

SEVERE WINTER WEATHER

Heavy Snow Storm	Four inches or more of snow in a six-hour period, or six inches or more in a 12-hour period.
Sleet Storm	Significant accumulation of solid ice pellets causing slippery surfaces.
Ice Storm	Significant accumulation of rain freezing on trees, power lines, causing slippery surfaces and damage.
Blizzard	35 - 44 mph winds, 32-11° Fahrenheit temperatures, blowing snow, and frequent one-quarter-mile visibility over an extended period of time.
Severe Blizzard	44+ mph winds, temperatures of 10° Fahrenheit or lower, a high density of blowing snow with visibility generally measured in feet for an extended period of time.

Source: National Climactic Data Center

The National Centers for Environmental Information (NCEI), former the National Climate Data Center maintains a historical record of severe weather events in its Storm Events Database. According to the Storm Events Database, Perry County has experienced 65 severe winter weather events, which are shown in Table 4.61 below. Due to the assortment of sources for meteorological data, not all sources have been identified or searched. Therefore, Table 4.61 may not represent all events that have occurred in Perry County.

TABLE 4.61**PERRY COUNTY SEVERE WINTER WEATHER**

Date	Type	Date	Type
11/27/1994	Freezing Rain And Sleet	2/16/2003	Heavy Snow
12/14/1994	Freezing Drizzle	12/5/2003	Heavy Snow
1/1/1995	Snow Drought	2/3/2004	Heavy Snow
1/6/1995	Ice Storm	2/6/2004	Ice Storm
2/3/1995	Heavy Snow	3/19/2004	Heavy Snow
2/15/1995	Freezing Rain	2/24/2005	Heavy Snow
2/26/1995	Light Snow	3/1/2005	Heavy Snow
2/26/1995	Freezing Rain Sleet And Light	12/9/2005	Heavy Snow
2/27/1995	Freezing Rain	12/16/2005	Winter Storm
3/8/1995	Snow	2/13/2007	Winter Storm
6/1/1995	Snow Drought	3/16/2007	Heavy Snow
11/14/1995	Winter Storm	2/1/2008	Winter Storm
12/19/1995	Winter Storm	2/12/2008	Ice Storm
1/7/1996	Blizzard	1/27/2009	Winter Storm
1/12/1996	Heavy Snow	12/19/2009	Winter Storm
11/28/1996	Heavy Snow	2/5/2010	Winter Storm
2/13/1997	Winter Storm	2/9/2010	Winter Storm

Date	Type	Date	Type
1/15/1998	Ice Storm	2/1/2011	Winter Storm
1/2/1999	Winter Storm	10/29/2011	Heavy Snow
1/8/1999	Winter Storm	12/14/2013	Winter Storm
1/14/1999	Winter Storm	2/4/2014	Winter Storm
3/14/1999	Heavy Snow	2/13/2014	Heavy Snow
1/25/2000	Heavy Snow	11/25/2014	Heavy Snow
1/30/2000	Heavy Snow	1/22/2016	Winter Storm
2/13/2000	Ice Storm	2/8/2017	Winter Storm
2/18/2000	Winter Storm	3/13/2017	Winter Storm
12/13/2000	Winter Storm	2/17/2018	Winter Storm
3/4/2001	Heavy Snow	3/20/2018	Winter Storm
1/6/2002	Heavy Snow	11/15/2018	Winter Storm
12/5/2002	Heavy Snow	2/11/2019	Winter Storm
12/10/2002	Ice Storm	2/20/2019	Winter Storm
12/25/2002	Heavy Snow	3/3/2019	Winter Storm
2/6/2003	Heavy Snow		

Source: National Centers for Environmental Information (NCEI), 2020

Future Occurrence

In a state with four identifiable seasons, Perry County will always run the chance of seeing severe winter storms every annual cycle. The impacts of climate change may increase the intensity of such winter weather events as it may with other weather related episodes.

Vulnerability Assessment

Winter Storms

Perry County is vulnerable to severe winter weather. The economic impacts from snow removal, road and infrastructure repair, etc. impart a great strain on the budgets and material resources of local municipalities. Along with municipalities, other vulnerable entities in the County include business and utility companies. Drivers experience automobile accidents while homeowners experience property damage. Municipalities are burdened with snow and ice removal, businesses are constantly losing income from closures, and utility companies are tasked with repairing the damage done to critical infrastructure (fallen power lines, water main breaks, etc.).

Probability

There is a high probability of severe weather affecting Perry County. Hurricanes and tropical storms, heavy fog, high winds, unseasonable temperatures, and winter weather all affect Perry County.

Maximum Threat

Severe weather comes in many forms. Most often, instances of severe weather are regional events affecting large areas. The maximum threat to Perry County is damage to property, facilities, and infrastructure as a result of severe weather.

Secondary Effect

Flooding and power outages are major secondary effects of severe weather. Heavy rain and melting snow can lead to large amounts of ground water that cannot be contained by streams and rivers. If the flooding is extreme, it may lead to dam failures. Power outages can be caused by heavy winds, strong storms, and large amounts of snow or ice melt that weigh on power lines, as well as from strains placed on power grids as they surge to meet demand. Transportation accidents are likely to increase as weather conditions deteriorate.

Flooding and traffic accidents increase the likelihood of a hazardous materials spill. Subsidence caused by flooding and extreme temperatures can damage vital lifelines such as gas and water pipelines. Essential services may experience limited disruptions and threaten the health and safety of at-risk populations in the affected area. Prolonged severe weather conditions can also have a major impact on the economic and financial condition of the County, as shortages in supplies and inflation of prices occurs.

Tornado or Wind Storm

Location and Extent

Tornados typically occur in Pennsylvania during the spring and summer months. In the past 125 years, about 250 tornados were reported in 58 of the 67 counties in Pennsylvania. The National Weather Service estimates the Commonwealth will experience 10 tornados annually. Tornados are measured by wind speeds on the Fujita Scale.

Range of Magnitude

TABLE 4.62

ENHANCED FUJITA SCALE

Category	Wind Speed	Description
EF0	40-70 mph	Gale tornado. Light damage: Some damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards, some windows broken; hurricane wind speed begins at 73 mph.
EF1	73-112 mph	Moderate tornado. Moderate damage: Peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off the roads; trees snapped or broken.
EF2	113-157 mph	Significant tornado. Considerable damage: Roofs torn off frame houses; mobile homes demolished; framed houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; tight-object missiles generated.
EF3	158-206 mph	Devastating tornado. Devastating damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
EF4	207-260 mph	Devastating tornado. Incredible damage: Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.
EF5	261-318 mph	Incredible tornado. Incredible damage: Strong frame houses lifted off foundations and carried considerable distances to disintegrate,

		automobile-sized missiles fly through the air in excess of 300 ft (100 m); trees debarked; incredible phenomena will occur.
EF6	319+ mph	The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

Source: National Climatic Data Center

As stated by the National Climatic Data Center, “wind speeds in tornados range from values below that of hurricane speeds to more than 300 miles per hour.” The NCDC continues, “The maximum winds in tornados are often confined to extremely small areas, and vary tremendously over short distances.” This is the reason that one house will be completely demolished by a tornado, yet the house next to it might be untouched. Additionally, the forward motion of tornados can range from speeds between 0 and 50 miles per hour.

Past Occurrence

Perry County has witnessed three tornados since 1967. Of these, the most significant was in 1967, when a Category 2 storm hit the County, resulting in \$250,000 in property damages.

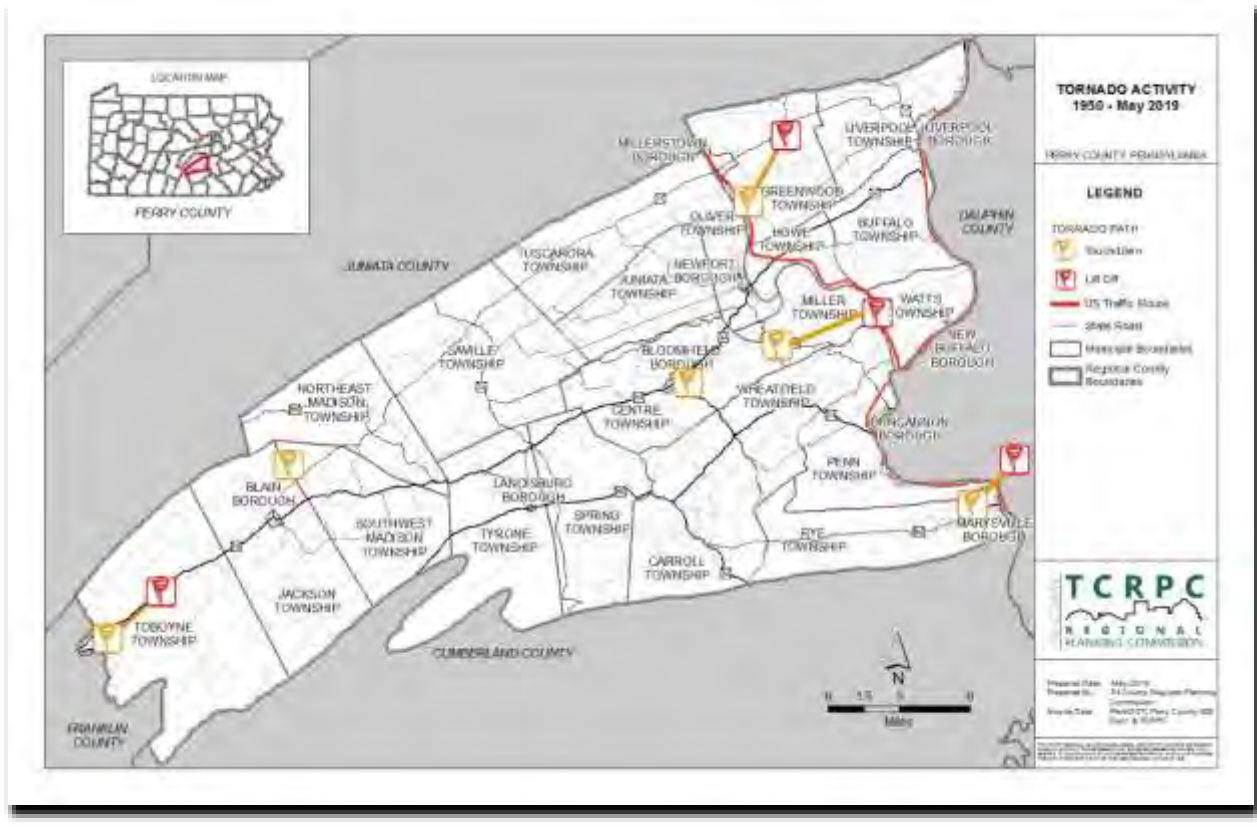
TABLE 4.63

PERRY COUNTY TORNADO HISTORY

Date	Magnitude
May 29, 2019	EF1
June 20, 1989	EF2
June 28, 1976	EF1
September 21, 1967	EF2

Source: National Climatic Data Center

MAP 4.17



Future Occurrence

The impacts of the present-day climate changes will likely increase the intensity of such wind events, as with other weather related incidents.

Vulnerability Assessment

Tornados are most common in the southeastern and southwestern parts of the Commonwealth; however, they have the potential to affect any part of the state if the right mix of weather conditions exists. Recent tornados have affected nearby Lebanon, Cumberland, Luzerne, and Dauphin Counties. Perry County typically experiences a lower incidence of tornados than these areas. The most recent tornado occurred in Halifax, PA, approximately 20 miles from Perry County, on December 1, 2006. It resulted in one loss of life, approximately 70 damaged homes, and a total of \$2M in damage. Tornados can usually be expected June-July. Factors that



F-3 Tornado, Campbelltown, PA, July 14, 2004

impact the amount of damage caused by a tornado are its strength, the time of day, and the area of impact. Usually, these distinct funnel clouds are localized phenomena impacting a small area. However, the high winds of tornadoes make them one of the most destructive of all natural hazards.

Probability

The probability of a tornado striking Perry County is relatively low. According to the National Climatic Data Center, three tornados hit the County between 1967 and 1989. History illustrates that the frequency of occurrence in Perry County is approximately once every 10 years or less.

Maximum Threat

While it is difficult to pinpoint the exact locations at greatest risk from a tornado, low-lying areas and flat fields are susceptible to touchdowns, while most damage will likely occur in densely populated areas. The maximum threat to Perry County is to property, facilities, and infrastructure in the more populated areas of the County.

Secondary Effect

Tornados typically have limited secondary effects. The most common is power failure, as severe wind conditions dismantle power sources. Significant structural damage to property, facilities, or infrastructure could cause small segments of the population to temporarily displace. Hazardous material spills can occur if a tornado damages a holding tank or causes a traffic accident. Limited disruptions of critical emergency services may be experienced by non-affected portions of the County. Economic and financial impact can range from nominal to major, based on the severity of damage.

Wildfire

Location and Extent

The U.S. Fire Administration (USFA) collects data from a variety of sources to provide a statistical analysis of fire incidents nationwide. According to the USFA, the number of fires, fire casualties, and economic losses has continued to decline over the last several years. From 1992-2001, fires per million population declined 204 percent, deaths per million declined 30 percent, and dollar loss per capita declined 6 percent. This data is confirmed by comparing it with the National Fire Protection Administration's (NFPA) data on national fire trends from 1977-2004. The NFPA data shows that in 1977, there were a total of 3,264,000 fires nationwide, resulting in 7,395 civilian deaths and 31,190 civilian injuries. In 2004, this number dropped to a total of 1,550,500 fires, 3,900 civilian deaths, and 17,785 civilian injuries nationwide. A 2001 study by the USFA showed the largest number of fires were classified as "outside/other" and accounted for 41 percent of all fires, while residential fires resulted in the highest percentage of fire deaths (77%), fire injuries (73%), and dollar loss (54%). Non-residential properties, such as industrial and commercial establishments, institutions, and educational facilities, accounted for only 8 percent of all fires, but 28 percent of total dollar loss.

From 1992-2001, Pennsylvania had an average fire death rate above the national average, with an average between 11-17 per million population. This is due primarily to the state's high population density. In 2001, Pennsylvania averaged 3.01 civilian deaths per 1000 fires and \$22,609 in property loss per fire. In 2003, the USFA recorded a fire death rate of 15.9 per million for Pennsylvania. This was above the 2003 national average of 14.4 per million and ranked the Commonwealth as the 15th highest state that year.

All fires can broadly be categorized as either wildfire or urban fire. Both categories have been responsible for some of the nation's largest, deadliest, and most destructive disasters.

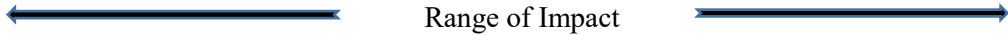
Perry County participates in the PennFIRS reporting program with the Office of the State Fire Commissioner. PennFIRS provides a statewide fire information and reporting system. The Office of the State Fire Commissioner is working with county agencies to encourage them to participate in PennFIRS as first level data collections sites to assure that this statewide data network works as smoothly and efficiently as possible. While there is no requirement that county EMA or 911 agencies get involved in the PennFIRS program, the valuable information available through PennFIRS can be beneficial and become an important resource.

The most frequent causes of devastating wildfires are droughts, arson, and human carelessness. During the drought of 1999, almost 8,500 acres of forest were burned in Pennsylvania. During the spring of 2001, 2,549 acres of forestland were burned in Pennsylvania. Pennsylvania will usually lose around 10,000 acres of forestland per year because of wildfires. Nationally, in 2003, wildfires burned five million acres in the United States, according to the National Interagency Fire Center.

Range of Magnitude

TABLE 4.63

SEVERITY OF WILDFIRE

 Range of Impact				
Low	Medium	High	Severe	Catastrophic
Under one acre of forestland, crop land or pasture impacted	Over one acre of forestland, crop land or pasture to just under 10 acres impacted; May threaten home(s) or business(es)	10 - 99 acres of forestland, crop land or pasture impacted; May burn home(s) or business(es)	Over 100 to 499 acres of forestland and/or pasture destroyed; May burn home(s) or business(es)	Over 500 acres of forestland and/or pasture destroyed; or event transforms into an urban fire

Past Occurrence

According to the National Centers for Environmental Information (NCEI) Storm Events Database, no significant wildfires have been recorded in Perry County from January 1950 to the present.

Perry County is located in the Tuscarora State Forest District. According to the Pennsylvania Department of Conservation and Natural Resources (DCNR), Bureau of Forestry, the Tuscarora District experienced 51 fires from 1999-2006, which destroyed a total of 129 acres of forest. This equates to an average of seven wildfires per year affecting an average of 18.5 acres per year. The Tuscarora District has a very low amount of incidents when compared to other forest districts.

TABLE 4.64

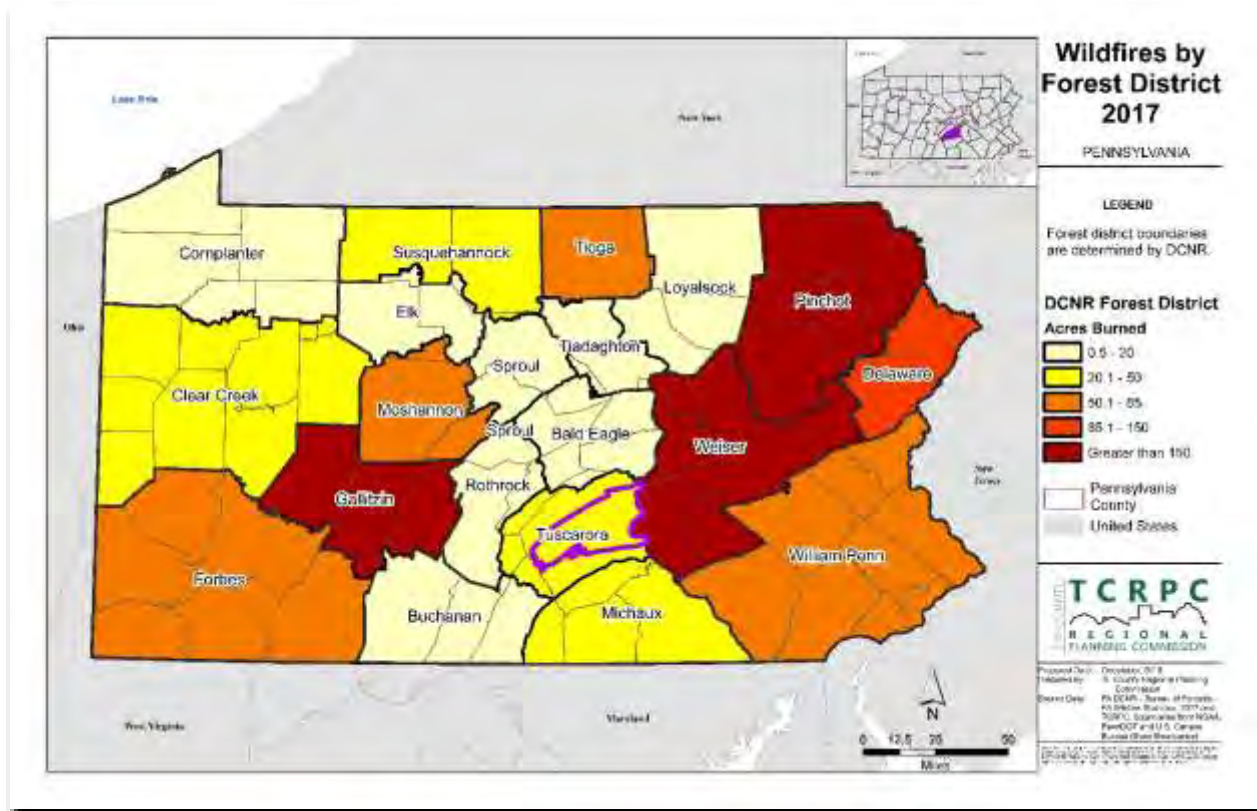
TUSCARORA STATE FOREST DISTRICT WILDFIRES, 2000-2006

Year	Forest District	Fires	% of Statewide	Acres	% of Statewide
2006	Tuscarora (D-3)	17	2	72.30	.9
	State Totals	912		7,919.73	
2005	Tuscarora (D-3)	9	1.1	13.45	.3
	State Totals	806		4,267.59	
2004	Tuscarora (D-3)	1	.4	.10	0
	State Totals	205		2,779.58	
2003	Tuscarora (D-3)	5	1.2	13.74	.6
	State Totals	408		2,026.62	

2002	Tuscarora (D-3)	2	.3	.71	0
	State Totals	639		2,902.99	
2001	Tuscarora (D-3)	9	1	7	.1
		856		7,135	
2000	Tuscarora (D-3)	8	1	22	.46
	State Totals	736		4,799	

Source: DCNR Bureau of Forestry

MAP 4.18



Future Occurrence

Whether initiated by a natural chain of events, or human-made conditions, wildfires will likely continue to occur, especially during dry periods brought on by drought. While instances are infrequent and unpredictable, there is an observable connection linked to mistakes made during periods of outdoor burning during inappropriate times. Municipal officials have the ability to greatly reduce this hazard by passing local ordinances banning outdoor burning.

Vulnerability Assessment

Although no significant wildfires have been recorded by the NCDC for Perry County, the rural nature of the County makes it prone to wildfires. The size and impact of a wildfire depends on

its location, climate conditions, and the response of firefighters. If the right conditions exist, these factors can usually mitigate the effects of wildfires. However, in times of drought, wildfires can be devastating. A summary of drought conditions from 1997-1999 can be seen to the right.

TABLE 4.65
PERRY COUNTY DROUGHT
EVENT HISTORY

Date	Type
10/31/1997	Drought
12/15/1998	Drought
7/1/1999	Drought
8/1/1999	Drought

Source: National Climatic Data Center (NCDC)

While the leading cause of wildfires is human carelessness and negligence, causing 98 percent of wildfires in Pennsylvania. Lightning strikes also have the potential to cause a wildfire. The table below depicts lightning-caused wildfires from 1999-2002.

TABLE 4.66
PENNSYLVANIA WILDFIRES CAUSED BY LIGHTNING

Year	Cause	Fires	Acres Destroyed or Affected	Costs
1999	Lightning	39	145	\$133,645.50
2000	Lightning	13	372	\$125,275.72
2001	Lightning	6	68	\$24,833
2002	Lightning	23	64.1	\$23,562.91

Source: DCNR Bureau of Forestry

Wildfires are most common in the spring (March - May) and fall (October - November) months. During spring months, the lack of leaves on the trees allows the sunlight to heat the existing leaves on the ground from the previous fall. The same theory applies for the fall; however, the dryer conditions are a more crucial factor.

MAP 4.19



Probability

While Perry County does not have a documented wildfire history, there still remains a probability that one could occur. However, this probability is low. Wildfire susceptibility is greater during drought conditions. With Perry County having a high frequency of drought declarations, the potential exists for lightning or human carelessness to start wildfires.

Maximum Threat

The surrounding rural municipalities of Perry County are at greatest risk for wildfires. Densely wooded areas, such as public and privately owned forests and recreation, are at particularly high risk, due to the availability and concentration of fuel. A fire may result from a lightning strike or human carelessness.

Secondary Effects

If a wildfire is not contained, certain secondary hazards may affect Perry County. Power outages may be the most prevalent of these hazards.

Health hazards could also result from a wildfire. The potential for brief periods of airborne ash, smoke, or soot to cause long-term health problems raises concerns among segments of the County's population who have pulmonary problems, heart disease, or breathing problems. The release of hazardous materials caused by a fire could cause a public health emergency.

Wildfires can damage lands and resources reducing vegetation and can causing soil erosion. Soil erosion leads to soil runoff, which can impact the health of the County's watersheds by contaminating these water sources and making them unfit for drinking. Reduced vegetation and soil erosion can result in mudslides when precipitation returns, causing a significant hazard to vital transportation arteries. Existing forage for livestock and wildlife can be destroyed, further straining the ecosystem.

Animal Health Emergency

Location and Extent

A pandemic is a disease that attacks or affects the population of an extensive area. This can be an entire country or continent. Each year, different strains of influenza are labeled as potential pandemic threats, for example. Although recently brought under control, Severe Acute Respiratory Syndrome (SARS) has shown the potential of becoming a pandemic. Neither the World Health Organization nor the Center for Disease Control and Prevention (CDC) has classified SARS. The following diseases have the potential to infect Perry County.

West Nile Virus (WNV)

This virus is usually spread by mosquitoes. A mild case will mimic the flu, while severe cases are life threatening. No drugs or vaccines are available to treat West Nile Virus, however, most people fully recover from it. In more severe cases, intensive supportive therapy is indicated, often involving hospitalization, intravenous fluids, airway management, respiratory support (ventilator), prevention of secondary infections (pneumonia, urinary tract), and good nursing care.

Influenza

On average, 10-20 percent of the United States population will contract the flu by person-to-person contact each year. This is commonly a result of respiratory droplets released during coughing and sneezing. Some of these influenza cases will be fatal. Each year, the flu causes the loss of approximately 36,000 American lives. This disease has the ability to suddenly affect all age groups on a global scale. The elderly, small children, those with weakened immune systems, and those affected by other illnesses are especially susceptible. “Avian Influenza” is a version of the flu that affects birds and is transmitted most commonly to humans by birds or through an intermediate host.

Mad Cow Disease

Bovine Spongiform Encephalopathy (BSE) is commonly called “Mad Cow Disease.” It is a fatal brain disease that occurs in livestock. In human cases, it is referred to as Creutzfeldt-Jakob Disease, or CJD. It can be acquired in humans by consuming the meat of an infected animal.

Hepatitis

Hepatitis is a disease affecting the liver. Hepatitis is usually spread by person-to-person contact. The different types of hepatitis are explained below.

- Hepatitis A (HAV) – a liver disease that can affect anyone
- Hepatitis B (HBV) – caused by a virus that attacks the liver, this virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death
- Hepatitis C (HCV) – a liver disease, which is found in the blood of those infected. HCV is spread by contact with the blood of an infected person.

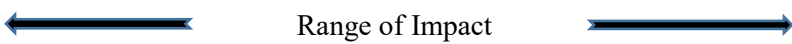
Chronic Wasting Disease

According to the Centers for Disease Control (CDC), Chronic Wasting Disease (CWD) is an endemic in Colorado, Wyoming, and Nebraska. New areas of focus have also developed in deer and elk herds across the United States. CWD is classified as a transmissible spongiform encephalopathy, or prion disease. The only known natural hosts are deer and Rocky Mountain elk.

Range of Magnitude

TABLE 4.67

IMPACTS OF DISEASE SPREADING AMONG THE FARMING COMMUNITY

 Range of Impact			
Low	Medium	High	Severe
Isolated one animal illness; quarantined	Farm-scale impacting multiple farm animals on a single farm; isolated culling and manageable carcass disposal	Farming community disease epidemic; multiple farms impacted; increased culling and regional carcass disposal needed	Agricultural disease Pandemic; mass culling and carcass disposal

Past Occurrence

West Nile Virus

According to the Centers for Disease Control and Prevention (CDC), West Nile Virus infected a reported 237 humans in Pennsylvania, resulting in eight deaths, in 2003. In an attempt to monitor any outbreak of the virus, the Perry County Conservation District administers the County’s West Nile tracking program. The tracking program tests all of Perry County for the West Nile Virus by setting approximately 15 traps weekly which catch both egg-laying mosquitoes and biting mosquitoes. Trapped mosquitoes are sent to a Pennsylvania Department of Environmental Protection (DEP) lab in Harrisburg, PA for testing. There were no positive test results in 2007, and none as of May, 2008. However, guidelines are in place should a positive test result be received.

Influenza

During the 20th Century, the emergence of several new Influenza A virus subtypes caused three pandemics, all of which spread around the world within a year of being detected.

- 1918-1919 “Spanish flu” [A (H1N1)] caused the highest number of known influenza deaths. More than 500,000 people died in the United States, and up to 50 million people may have died worldwide. Many people died within the first few days after infection, and others died of secondary complications. Nearly half of those who died were young, healthy adults. Influenza A (H1N1) viruses still circulate today, after being introduced again into the human population in 1977.
- 1957-1958 “Asian flu” [A (H2N2)] caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.
- 1968-1969 “Hong Kong flu” [A (H3N2)] caused about 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year. Influenza A (H3N2) viruses still circulate today.

Both the 1957-1958 and 1968-1969 pandemics were caused by viruses containing a combination of genes from a human influenza virus and an Avian Influenza virus. The 1918-1919 pandemic virus also appears to have had an avian origin.

Pennsylvania’s \$600 million poultry industry lost \$70 million from 1983-1984 as a result of an avian flu outbreak.

Mad Cow Disease

As stated by the U.S. Department of Agriculture, there has been only one confirmed case of Mad Cow Disease in the United States.

Hepatitis

In 2003, the Pennsylvania Department of Health and the CDC investigated an outbreak of Hepatitis A among patrons of a national chain restaurant in western Pennsylvania. Approximately 555 persons with Hepatitis A were identified, including at least 13 food service workers and 75 residents of six other states who dined at the restaurant. Preliminary analysis of a case-control study implicated green onions as the source of the outbreak. Hepatitis A can be contracted by eating food which was handled by infected workers at some point in the food processing chain, or which was not properly cleaned.

Department of Health

http://www.dsf.health.state.pa.us/health/lib/health/guide/NOTIFIABLE_DISEASES.html

Chronic Wasting Disease

CWD was first identified in wild herds in 1981 in Colorado. Throughout the 1990’s, CWD was diagnosed in deer and elk herds in northeastern Colorado and southeastern Wyoming. By 2000 the disease had also been identified in Nebraska, seemingly spreading throughout the tri-corner area of the three states.

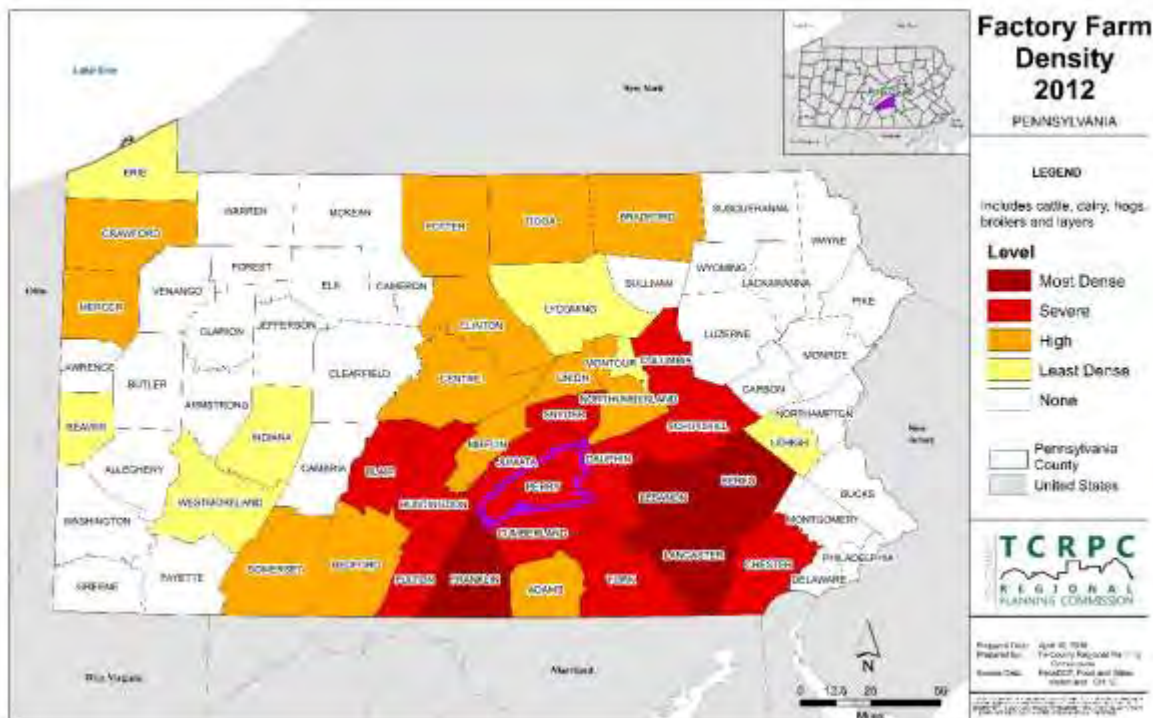
Future Occurrence

As with human infectious diseases, each year it seems as if the world is experiencing some sort of epidemic. If we knew where the next virus would originate, we would be in a better position to slow its progression and impact. Ports of entry have been known to be such gateways, and for Pennsylvania that would be Erie, and Philadelphia.

Vulnerability Assessment

Changes to the agriculture economy have seen the decline in the number of traditional farms. Many of these properties have transitioned over to a factory farm working arrangement. Increased animal density on smaller land area increases the chance for animal diseases to spread quickly through such a facility.

MAP 4.20



Influenza¹⁶

An influenza pandemic is a global outbreak of disease that occurs when a new Influenza A virus appears or “emerges” in the human population, causes serious illness, and spreads easily among people worldwide. Pandemics are different from seasonal outbreaks or “epidemics” of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that already circulate among people, whereas pandemic outbreaks are caused by new subtypes, by subtypes that have never circulated among people, or by subtypes that have not circulated among people for a long time. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

Appearance (Emergence) of Pandemic Influenza Viruses

There are many different subtypes of influenza or “flu” viruses. Pandemic viruses emerge as a result of a process called “antigenic shift,” which causes an abrupt or sudden, major change in Influenza A viruses. The appearance of a new Influenza A virus subtype is the first step toward a pandemic. However, to cause a pandemic, the new virus subtype also must have the capacity to spread easily from person to person. Once a new pandemic influenza virus emerges and spreads, it usually becomes established among people and circulates for many years as seasonal epidemics of influenza. The U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have large surveillance programs to monitor and detect influenza activity around the world, including the emergence of possible pandemic strains of influenza virus.

Vaccines to Protect Against Pandemic Influenza Viruses

A vaccine probably would not be available in the early stages of a pandemic. When a new vaccine against an influenza virus is being developed, scientists around the world work together to select the virus strain that will offer the best protection against that virus. Manufacturers then use the selected strain to develop a vaccine. Once a potential pandemic strain of influenza virus is identified, it takes several months before a vaccine becomes widely available. If a pandemic occurs, the U.S. government will work with many partner groups to make recommendations guiding the early use of available vaccine.

Antiviral Medications to Prevent and Treat Pandemic Influenza

Four different influenza antiviral medications (Amantadine, Rimantadine, Oseltamivir, and Zanamivir) are approved by the U.S. Food and Drug Administration (FDA) for the treatment and/or prevention of influenza. All four usually work against Influenza A viruses. However, the drugs may not always work, because influenza virus strains can become resistant to one or more of these medications. For example, the Influenza A (H5N1) viruses identified in humans in Asia in 2004 and 2005 have been resistant to Amantadine and Rimantadine. Monitoring of avian viruses for resistance to influenza antiviral medications continues.

¹⁶ www.CDC.gov, December 2005.

Preparing for the Next Pandemic

Many scientists believe it is only a matter of time until the next influenza pandemic occurs. The severity of the next pandemic cannot be predicted, but modeling studies suggest the impact of a pandemic on the United States could be substantial. In the absence of any control measures (vaccination or drugs), it has been estimated that in the United States, a “medium-level” pandemic could cause 89,000-207,000 deaths, 314,000-734,000 hospitalizations, 18-42 million outpatient visits, and another 20-47 million sick people. Between 15-35 percent of the U.S. population could be affected by an influenza pandemic, and the economic impact could range between \$71.3 - \$166.5 billion.

Influenza pandemics are different from many of the threats for which public health and health-care systems are currently planning. A pandemic will last much longer than most public health emergencies, and may include “waves” of influenza activity separated by months. In 20th Century pandemics, a second wave of influenza activity occurred 3-12 months after the first wave). The numbers of health care workers and first responders available to work will likely be reduced; they will be at high risk of illness from exposure in the community and in health care settings. Some may have to miss work to care for ill family members. Resources in many locations could be limited, depending on the severity and spread of an influenza pandemic.

Because of these differences and the expected size of an influenza pandemic, it is important to plan preparedness activities that will permit a prompt and effective public health response. The U.S. Department of Health and Human Services (HHS) supports pandemic influenza activities in the areas of surveillance (detection), vaccine development and production, strategic stockpiling of antiviral medications, research, and risk communications. In May 2005, the U.S. Secretary of HHS created a multi-agency National Influenza Pandemic Preparedness and Response Task Group. This unified initiative involves CDC and many other agencies (international, national, state, local, and private) in planning for a potential pandemic. Its responsibility includes revision of a U.S. National Pandemic Influenza Response and Preparedness Plan.

Avian Influenza (Bird Flu)

This is general information about Avian Influenza (bird flu) and information about one type of bird flu, called Avian Influenza A (H5N1) that has caused infections in birds in Asia and Europe, and in humans in Asia.

Avian Influenza is an infection caused by Avian (bird) Influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, Avian Influenza is very contagious among birds and can make some domesticated birds very sick or cause death.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions on surfaces that are contaminated from infected birds. Domesticated birds may become infected with Avian Influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

Infection with Avian Influenza viruses in domestic poultry causes two main forms of disease, distinguished by low and high extremes of virulence. The “low pathogenic” form may go undetected and usually causes only mild symptoms (such as ruffled feathers and a drop in egg production). However, the highly pathogenic form spreads more rapidly through flocks of poultry. This form may cause disease that affects multiple internal organs and has a mortality rate that can reach 90-100 percent, often within 48 hours.

Outbreaks of Avian Influenza H5N1 occurred among poultry in eight countries in Asia (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam) during late 2003 and early 2004. At that time, more than 100 million birds in the affected countries either died from the disease or were killed to control the outbreaks. By March 2004, the outbreak was reported under control. Since late June 2004, however, new outbreaks of Influenza H5N1 among poultry were reported by several countries in Asia (Cambodia, China [Tibet], Indonesia, Kazakhstan, Malaysia, Mongolia, Russia [Siberia], Thailand, and Vietnam). It is believed these outbreaks are ongoing. Influenza H5N1 infection also has been reported among poultry in Turkey, Romania, and Ukraine. Outbreaks of Influenza H5N1 have been reported among wild migratory birds in China, Croatia, Mongolia, and Romania.

There are many migratory birds that travel through Pennsylvania. Waggoner’s Gap, located on the Kittatinny Ridge, near Cumberland and Perry County, is identified as Important Bird Area #51 by the Audubon Society of Pennsylvania. Volunteer counters recorded more than 21,000 migrating raptors during the fall 2005 migration season. The hawk species included: Black Vultures, Turkey Vultures, Bald Eagles, Northern Harriers, Sharp-shinned Hawks, Cooper’s Hawks, Northern Goshawks, Red Shouldered Hawks, Broad-winged Hawks, Red-tailed Hawks, Rough-legged Hawks, Golden Eagles, American Kestrels, Merlins, Peregrine Falcons, and other unidentified raptors.

The Wild Bird Feeding Industry Research Foundation states that while wild birds are capable of carrying the virus, in most cases the virus spreads to new locations through the transportation of infected poultry and poultry products. Further, the Research Foundation states that it’s safe to watch wild birds in North America, as well as to feed them, and attract them to your yard.¹⁷

Human Infection with Avian Influenza Viruses

The risk from Avian Influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of Avian Influenza infection have been reported since 1997. Most cases in humans have resulted from contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretion/excretions from infected birds. The spread of Avian Influenza viruses from one ill person to another has been reported very rarely, and transmission has not been observed beyond one person.

“Human Influenza” virus usually refers to those subtypes that spread widely among humans. There are only three known A subtypes of influenza viruses (H1N1, H1N2, and H3N2) currently circulating among humans. It is likely that some genetic parts of current Human Influenza A

¹⁷ Wild Bird Feeding Industry (www.wbfi.org)

viruses came from birds originally. Influenza A viruses are constantly changing and might adapt over time to infect and spread among humans.

During an outbreak of Avian Influenza among poultry, there is a possible risk to people who have contact with infected birds or surfaces that have been contaminated with secretions or excretions from infected birds. The table that follows illustrates the chicken population and production for Perry County in 2017 from the U.S. Census of Agriculture. Approximately half of the chickens are raised for consumption; 28.8% of chickens are used for laying eggs (layers); and 19.6% of chickens are pullets, or chickens that are young and do not yet lay eggs.

TABLE 4.68

PERRY COUNTY CHICKEN POPULATION

Year	Broilers and other meat-type chickens	Layers	Pullets	Total
2017	740,716	414,785	283,402	1,438,903

Source: 2017 Census of Agriculture, U.S. Summary and State Data

TABLE 4.69

PERRY COUNTY TURKEY POPULATION

Year	Turkeys
2017	435,572

Source: 2017 Census of Agriculture, U.S. Summary and State Data

Symptoms of Avian Influenza in humans have ranged from typical Human Influenza-like symptoms (fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other severe and life-threatening complications. The symptoms of Avian Influenza may depend on which virus caused the infection.

Studies done in laboratories suggest that the prescription medicines approved in the United States for Human Influenza viruses should work in treating Avian Influenza infection in humans. However, influenza viruses can become resistant to these drugs, so these medications may not always work. Additional studies are needed to demonstrate the effectiveness of these medicines.

Human Health Risks During the H5N1 Outbreak

The H5N1 virus does not usually infect people, but more than 140 human cases have been reported by the World Health Organization since January 2004. Human cases of Influenza A (H5N1) infection have been reported in Cambodia, China, Indonesia, Thailand, and Vietnam. For the most current information about Avian Influenza and cumulative case numbers, see the World Health Organization (WHO) website at http://www.who.int/csr/disease/avian_influenza/en/. Most of these cases have occurred as a result of people having direct or close contact with infected poultry or contaminated surfaces; however, a few cases of human-to-human spread of H5N1 have occurred.

Of the few Avian Influenza viruses that have crossed the species barrier to infect humans, H5N1 has caused the largest number of detected cases of severe disease and death in humans. In the current outbreaks in Asia and Europe, more than half of those infected with the virus have died. Most cases have occurred in previously healthy children and young adults. However, it is possible that the only cases currently being reported are those in the most severely ill people, and that the full range of illness caused by the H5N1 virus has not yet been defined.

So far, the spread of H5N1 virus from person to person has been rare and has not continued beyond one person. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned H5N1 virus eventually could be able to infect humans and spread easily from one person to another. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic (worldwide outbreak of disease) could begin.

No one can predict when a pandemic might occur. However, experts around the world are watching the H5N1 situation in Asia and Europe very closely, and are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

Treatment and Vaccination for H5N1 Virus in Humans

The H5N1 virus that has caused human illness and death in Asia is resistant to Amantadine and Rimantadine, two antiviral medications commonly used for influenza. Two other antiviral medications, Oseltamavir and Zanamavir, would probably work to treat influenza caused by H5N1 virus, but additional studies need to be done to demonstrate their effectiveness.

Currently there is not a commercially available vaccine to protect humans against H5N1 virus seen in Asia and Europe. However, vaccine development efforts are taking place. Research studies to test a vaccine to protect humans against H5N1 virus began in April 2005, and a series of clinical trials is underway.

Mad Cow Disease

As previously stated, there has only been one case of Mad Cow Disease in the United States. In 1997, a ban was established by the U.S. Department of Agriculture (USDA) on the importation of live animals or animal products from countries with the disease. According to the U.S. Department of Agriculture, Perry County had 28,400 cattle located throughout the County’s farms in 2007. Of course, when considering this vulnerability, it must be acknowledged that residents could purchase imported beef from areas outside of Perry County.

TABLE 4.70

PERRY COUNTY CATTLE AND CALVES POPULATION

Year	Cattle and Calves
2017	32,642

Source: 2017 Census of Agriculture, U.S. Summary and State Data

Vulnerability to Hepatitis viruses is basically the same around the country. The keys to avoiding Hepatitis are vaccinations, good hygiene, and common sense. Adequate sanitation and clean personal habits will help reduce the spread of Hepatitis A and Hepatitis B. In areas where sanitation is questionable, water should be boiled, food should be cooked, and fruit should be peeled.

Chronic Wasting Disease

According to the CDC, CWD has not been identified in free-ranging deer herds in Pennsylvania. However, according to the Pennsylvania Game Commission, efforts to detect CWD in the state began in 1998. In September of 2005, the Game Commission, Governor’s Policy Office, Department of Agriculture, Department of Health, Department of Environmental Protection, Pennsylvania Emergency Management Agency and U.S. Department of Agriculture completed a response plan to prevent CWD from entering our borders and, in the event CWD is found in the state, to detect, contain and work to eradicate the disease. Public health officials recommend that human exposure to the CWD agent be avoided, however, no evidence that CWD affects humans has been found.

Swine Flu

This is the name assigned to a type of influenza virus which affects pigs. There was a global outbreak as recently as 2009-2010.

TABLE 4.71

PERRY COUNTY HOGS AND PIGS POPULATION

Year	Hogs and Pigs
2017	50,818

Source: 2017 Census of Agriculture, U.S. Summary and State Data

African Swine Flu

Perry County has a strong agricultural presence, as does most of Central Pennsylvania. Perry is amongst the densest area of farmland in the state. According to the 2012 Census of Agriculture there were 889 farms producing over \$140 million of products.

West Nile Virus

According to the PADEP’s West Nile website, the virus has not been detected in humans in Perry County. The disease however is here in the Southcentral PA Region. Last year in 2018, Dauphin County had two cases and Franklin County with eight cases.

Probability

Currently, the probability of a widespread public health emergency occurring in Perry County is relatively low, with a frequency of every 30 years or less; however there exists the potential for the H5N1 virus to increase the probability of a public health emergency to affect Perry County in

the future. Instances can vary greatly in the degree of severity. Minor outbreaks of less serious communicable diseases and viruses, such as seasonal influenza, occur more frequently.

Maximum Threat

Public health emergencies typically occur on a regional basis. Sources include infected animals, contaminated food, and improperly prepared food. While all of Perry County is vulnerable to a public health emergency, the likely source of a severe infection may be a farm or restaurant. In the event of a large scale public health emergency, such as with a potential pandemic, the maximum threat to the County lies in dense population concentrations, and in outlying commercial agricultural operations with dense populations of cattle, fowl and swine. The health and safety of persons in the affected area and the sustainability of existing economic and financial conditions are at greatest risk.

Secondary Effects

The secondary effects of a public health emergency can vary from minimal to severe. In the event of a limited or easily contained public health emergency, such as season influenza or hepatitis, the County may experience nominal disruption to government functions and industry commodities and services. Social impacts and environmental impacts could also be nominal. In the event of a widespread public health emergency, such as in the event of pandemic influenza, the secondary effects will be severe. There will be a high level of absenteeism and staffing shortages among the County's workforce at all levels and across all occupations. Critical services, such as public safety, public health, and government functions, will be greatly reduced. Severe disruption of utilities, transportation, and commerce will occur. Travel restrictions and business closures may occur. Agri-business could suffer as the result of widespread culling, quarantines, and bans. The resulting economic and social impacts will be very high.

During a massive animal health emergency a very important consideration is carcass management. Efficient and proper care with the handling and disposal of diseased animals is critical to protecting the public's health. Culling of animals may be necessary to prevent further spread of a contagious virus/disease. The USDA has a webpage dedicated solely on this subject. <https://www.epa.gov/agriculture/agriculture-and-carcass-disposal>

In addition, to the webpage, a 2015 USDA report on this topic can be accessed as follows: https://www.aphis.usda.gov/stakeholders/downloads/2015/eis_carcass_management.pdf

Obviously the mitigating actions needed to prevent the spread of such contagions within our farming community will come at a cost. Planning, education and preparation are all key to reducing the chance of catastrophic impact to our County's farm economy.

Hazard Vulnerability Summary

Methodology

Five criteria were selected to assure a systematic and comprehensive approach to hazard analysis:

Disaster **frequency** and its effects or severity are important as a basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas manmade or technological events tend to change over time with advancements in technology and methods of operation.

History: A record of past events is particularly helpful to evaluate hazards in Perry County. Both the frequency and severity of past events are useful to predict future events. Past records of the County's hazards also offer valuable information when tempered with the knowledge of preventive efforts, changes in the knowledge of preventive efforts, and advancements in technology that may reduce the frequency or severity of such an event. Other hazards, such as terrorism, must be analyzed based on existing threat elements in and in proximity to Perry County.

Extent of Hazard Risks

Hazard Assessment shall include a description of the type...of all natural hazards that can affect the jurisdiction.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the...location and extent of all natural hazards that affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

In addition to probability, the maximum threat or worst-case disaster should be considered for each hazard. The maximum threat provides an upper boundary for the level of preparedness that may be necessary.

Also worth considering is how each individual hazard poses certain threats to the County and its municipalities. However, there are also secondary effects of many local hazards that can be just as devastating. These secondary effects cause many hazards to become regional hazards affecting many areas, with differing impacts.

Vulnerability is defined as: The susceptibility of a community to property destruction, injury, or death resulting from a hazard event defines the degree of vulnerability. The degree of vulnerability may be related to geographic location (as with floodplains), the type of facility or structure, or the socioeconomics of a given area. Additionally, certain population groups may be more vulnerable to some hazards because of immobility or their inability to take protective action.

Probability is defined as: The probability of an occurrence in the future is another important factor to consider when preparing for an all-hazards response. An event that occurs annually

with relatively minor impact may deserve more emphasis than a major event that occurs once in 50 or 100 years.

The County relied heavily on existing data sources developed by other Perry County departments, including the County's existing Hazard Vulnerability Analysis, draft documents of the County Comprehensive Plan, the County Subdivision and Land Development Ordinance, municipal ordinances, digital tax assessment data obtained through the Assessment Department, and GIS data from the Mapping Department.

Information was gathered from a variety of sources to develop hazard profiles. State agency sources included: the PA Department of Environmental Protection (DEP), PA Department of Conservation of Natural Resources (DCNR), and the PEMA.

Federal agency sources included: the Bureau of Transportation Statistics, Environmental Protection Agency (EPA), National Climatic Data Center (NCDC), and FEMA.

Ranking Results

The Perry County Hazard Risk Assessment Matrix, illustrated in [Graph 4.1](#), provides a systematic method for assigning a risk factor to a hazard event, based on the impact and frequency of the event. Values ranging from 1-5 (1 representing a low impact, 5 representing a catastrophic impact) were first assigned to four different vulnerability areas, based on estimated impact: critical facilities, social, economic, and environmental.

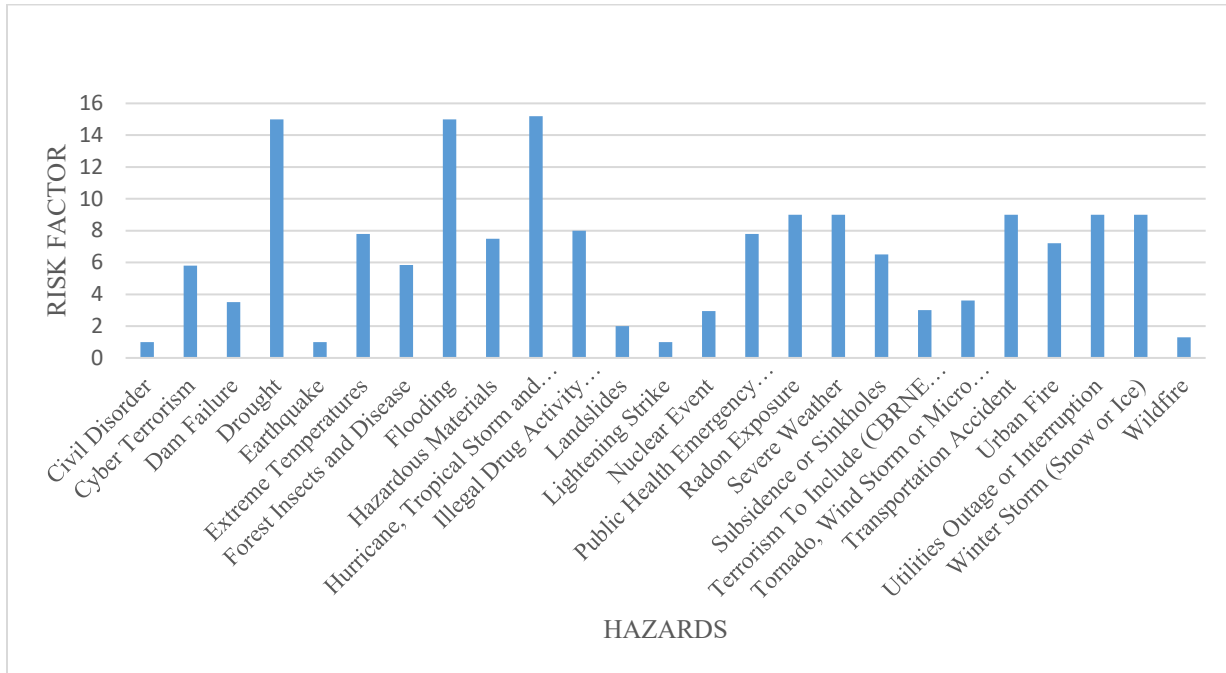
These numbers were then weighted by significance. For instance, a high amount of damage to the population (social vulnerability) is more devastating than a high amount of damage to the economy (economic vulnerability). Therefore social vulnerability is weighted at 40 percent while economic vulnerability is weighted at 25 percent. Based on the frequency of occurrence, each hazard is also assigned a value ranging from 1-5 (1 representing an event that occurs once every 31 years or more; 5 representing an annual event). The range of the risk factor score is 0-25. The example below illustrates how a hazard's risk factor is calculated.

Risk Factor = Frequency x [(0.25 x Critical Facilities) + (0.40 x Social) + (0.25 x Economic) + (0.10 x Environmental)]

An example of this equality in use for a flood can be seen below:

$$5 \times [(0.25 \times 3) + (0.40 \times 3) + (0.25 \times 3) + (0.10 \times 3)] = 15$$

GRAPH 4.1
RISK FACTOR BY HAZARD



As illustrated in Graph 4.1, each hazard has an associated with a risk factor. Risk factors help risk management team members differentiate credible high-hazard threats that may result in loss of life and property from less probable risks.

The top three tallied hazards as identified by the public in Perry County Hazards survey at the onset of this update project are:

- 1. Severe Weather,**
- 2. Flooding, and**
- 3. Illegal Drug Activity (including opioid abuse).**

Further evaluation of risk and HVA has revealed the following risk factor rank:

- 1. Hurricane, Tropical Storm and Nor'easter,**
- 2. Flooding, and**
- 3. Drought.**

While this HVA focuses mainly on the top three hazards, the analysis illustrates how often these hazards find themselves interconnected. The vulnerability of critical facilities, social, economic, and environmental factors are analyzed by the threat each hazard proposes. A detailed description of all hazards is found in Appendix I: Hazard Profiles.

Vulnerability Assessment: Identifying Assets

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

According to the Basic Studies component of the Perry County Comprehensive Plan, Perry County is projected to see population stabilize with a .5% increase between 2010 and 2035. This population increase may result in the need for more critical facilities such as schools, daycare centers, or healthcare centers. This need for more critical facilities will be closely monitored through the five-year update of this HMP.

Severe Weather

Flooding

Perry County is highly vulnerable to floods. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily.

High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. The secondary effects caused by flooding can add to the damages. Power loss can leave citizens without heat for extended periods of time. The transportation infrastructure of the County can be crippled by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

The NFIP establishes minimum floodplain management criteria. Property owners in the floodplain should comply with land use floodplain regulations for their communities. As of February 2020, all municipalities within Perry County are classified as participating in the NFIP. The NFIP's Community Ratings System (CRS) discounts flood insurance premiums in communities that establish floodplain management programs that go beyond NFIP minimum requirements. Under the CRS, communities receive credit for more restrictive regulations; acquisition, relocation, or flood-proofing of flood-prone buildings; preservation of open space; and other measures that reduce flood damages or protect the natural resources and functions of the floodplain. As of October 1, 2019, Newport Borough is the only municipality in Perry County which participates in the Community Rating System. Newport has a Class 8 rating within CRS which gives flood insurance discounts of 10% if the property is located in the Special Flood Hazard Area, and 5% discounts for properties not located in the floodplain.

The Perry County economy is highly impacted by flooding. The potential impacts on the economy presented by this hazard can lead to long-term economic disruption, especially among small businesses. Flooding can destroy the physical structures, merchandise, and equipment essential for business operations. Secondary effects of flooding include power outages and transportation accidents. Power outages can stop a business from operating, while transportation accidents can hinder the supply of essential goods, services, and supplies.

Refer to APPENDIX D - LOCAL MUNICIPALITY FLOOD VULNERABILITY MAPS for more detail.

Social Vulnerability Assessment

The social vulnerability assessment identifies how the top hazards affect the population of Perry County, and identifies areas of special needs populations, which consist of citizens with disabilities, people over the age of 65, and persons living alone, among others. The special needs population must be identified and targeted in successful mitigation efforts. Table 4.72 presents an overview of the special needs population in Perry County according to 1990, 2000 and 2010 U.S. Census data.

According to the U.S. Census, Perry County has a growing elderly population, an increasing number of householders living alone, and an increasing number of citizens who do not speak English well. There has also been a significant increase in the number of County residents living below the poverty line. These individuals are just an example of the special needs population of Perry County. Should a natural or manmade hazard impact these residents, it is important to know their location and their individual needs.

It has been a hazard mitigation planning goal of the County to maintain a special needs registry to assist in locating and evacuating the special needs population in emergency situations.

TABLE 4.72
SPECIAL NEEDS POPULATION

	1990	2000	2010	2000-2010 % Change
Total Population	41,172	43,602	45,969	+ 5.4% increase
Urban Population	2,425	5,956	5,287	+ 11.5% increase
Rural Population	38,747	37,646	40,682	+ 8.1% increase
Elderly (65+)	4,596	5,333	6,294	+ 18.0% increase
Householder Living Alone	2,752	3,614	4,110	+ 13.7 increase
Renter Occupied Dwelling Units	3,060	3,369	3,693	+ 9.6% increase
Non-English Speaking Population	78	153	343	+ 124.2% increase
Population Living in Poverty	2,085	3,286	4,200	+ 27.8% increase
Institutionalized Population	340	465	494	+ 6.2% increase
Disabilities (age 5+)	-	12,090	6,791	- 43.8% decrease
Sensory Disability	-	1,521	2,952	+ 94.1% increase
Physical (Ambulatory) Disability	-	3,355	3,241	- 3.4% decrease
Mental (Cognitive) Disability	-	1,683	2,530	+ 50.3% increase

Self-Care Disability	-	889	1,098	+ 23.5% increase
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Source: U.S. Census Bureau, Survey of Income and Program Participation

Considering Flooding

Perry County is highly vulnerable to floods. Flooding puts the entire population at some level of risk, whether through the flooding of their homes, businesses, or places of employment, or the road, sewer, and water infrastructure that serve them daily.

High floodwaters can devastate homeowners with property damage, property loss, and extensive, time-consuming cleanup. The secondary effects caused by flooding can add to the damages. Power loss can leave citizens without heat for extended periods of time. The transportation infrastructure of the County can be crippled by flooding events, which can endanger citizens attempting to travel or evacuate the area, as well as leave those remaining without goods and services.

Flooding is discussed earlier in this chapter in the Flood Hazard profile.

Economic Vulnerability Assessment

A community’s economic vulnerability is an important factor to consider when assessing the effects of certain hazards. Loss of income or loss of jobs through business interruption or closures can devastate a community. The economic vulnerability of Perry County when facing the top three hazards (flooding, drought, and transportation incidents) is analyzed in this section. Each hazard presents certain risks to the economy of the County.

This analysis determines the hazard vulnerabilities of economic centers. It is essential to identify the potential negative impacts the greatest hazards may have on the County economy. This enables the prioritization of potential hazard mitigation strategies to eliminate or reduce the risks these hazards present.

Considering Flooding

The Perry County economy is highly impacted by flooding. The potential impacts on the economy presented by this hazard can lead to long-term economic disruption, especially among small businesses. Flooding can destroy the physical structures, merchandise, and equipment essential for business operations. Secondary effects of flooding include power outages and transportation accidents. Power outages can stop a business from operating, while transportation accidents can hinder the supply of essential goods, services, and supplies. Additionally, flooding can have a negative impact on the environment. Often times, when flood waters rise quickly, catching the public off guard or unprepared, they can create contamination. For example, flooding can result in contamination (a secondary hazard) when raw sewage, animal carcasses, chemicals, pesticides, or other hazardous materials are transported through sensitive habitats, neighborhoods, water recharge areas, or business settings. Events such as these require major clean-up and remediation efforts. Not only do these effects have a direct negative impact on the environment, but there could be an economic impact to the county should there be a reduction in recreation, or an impact to agricultural or livestock operations.

Environmental Vulnerability Assessment

An environmental vulnerability assessment identifies environmental resources that may be impacted by hazards and their secondary effects, such as toxic releases during hazardous material spills. The County’s

Superfund Amendments and Reauthorization Act (SARA) facilities are highlighted in this plan. According to the EPA, a superfund site is an uncontrolled or abandoned place where hazardous waste is located, possibly affecting local ecosystems or people. Further detail on the County's SARA facilities is available through the County Emergency Management Agency. The location, identification of hazardous material spills, and associated dangers with each of the County's SARA facilities is critical in assessing the potential impacts hazards may have on the environment of Perry County.

The environment of Perry County is highly impacted by flooding. For the most part, flooding is a natural occurrence and, alone, cannot do much harm to the environment.

The flooding of SARA facilities can be a significant threat to the environment. Table E.13 lists the Perry County SARA facilities that are located within the 100-year floodplain. According to data provided by Perry County, and GIS analysis, there are only two SARA facilities within the County that are located within the 100-year floodplain.

Potential Loss Estimates

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Potential Property Loss Due to Flooding

Flooding is one of the top three and most significant hazards in Perry County. An exposure analysis was performed to estimate the potential impact of a 100-year flood to Perry County. The analysis methodology utilized the FEMA Digital Flood Insurance Rate Map boundary of the 100-year floodplain and Perry County parcel boundaries. Parcel boundaries were provided by the Perry County GIS Department.

The results are presented in Table 4.72 below. It is estimated that Perry County's potential losses during a 100-year event could reach approximately \$558 million dollars, which is approximately 20.7% of the total market value for structures in Perry County. Carroll Township, Penn Township, and New Buffalo Borough have the highest exposed value with potential damages reaching approximately \$176 million. Carroll Township had the highest market value exposed with \$71 million, representing 27.6% of the market value for the township. Penn Township had the next highest exposed value with \$56 million, or 22.7% of the township's total market value. Newport Borough had the third highest exposed market value with \$48 million which is approximately 64.8% of the total market value of the borough.

There are assumptions and limitations to this analysis. This data does not include attribute information on first-floor elevations, which is essential to assess the base flood elevation's impact on the structures in the county. Further, this analysis assumes a total loss for any parcel intersected by the floodplain. As a result of these limitations, the results should be considered estimates, and are for planning purposes only.

TABLE 4.72
POTENTIAL LOSS DUE TO FLOODING

Municipality	# Parcels in the 100- Year Floodplain	% Parcels in the 100- Year Floodplain	Building Market Value in the 100-year Floodplain	Total Building Market Value	% Building Market Value in 100-Year Floodplain
Blain Borough	27	19.9%	\$2,441,300	\$17,747,000	13.8%
Bloomfield Borough	25	5.2%	\$10,109,500	\$84,978,700	11.9%
Buffalo Township	195	25.4%	\$13,408,800	\$63,125,900	21.2%
Carroll Township	633	27.0%	\$71,203,500	\$257,690,400	27.6%
Centre Township	133	10.0%	\$13,601,400	\$133,321,800	10.2%
Duncannon Borough	302	50.8%	\$23,643,300	\$50,478,700	46.8%
Greenwood Township	198	27.2%	\$23,169,800	\$80,625,700	28.7%
Howe Township	126	37.2%	\$8,112,500	\$41,947,600	19.3%
Jackson Township	127	25.6%	\$13,793,900	\$47,340,400	29.1%
Juniata Township	130	15.0%	\$13,438,400	\$84,438,000	15.9%
Landisburg Borough	0	0.0%	\$0	\$9,249,300	0.0%
Liverpool Borough	83	19.3%	\$6,755,900	\$46,793,200	14.4%
Liverpool Township	203	27.8%	\$14,258,800	\$70,829,300	20.1%
Marysville Borough	157	13.9%	\$10,150,200	\$125,139,600	8.1%
Miller Township	98	17.8%	\$3,410,600	\$36,868,500	9.3%
Millerstown Borough	23	7.2%	\$1,672,700	\$42,245,900	4.0%

Municipality	# Parcels in the 100-Year Floodplain	% Parcels in the 100-Year Floodplain	Building Market Value in the 100-year Floodplain	Total Building Market Value	% Building Market Value in 100-Year Floodplain
New Buffalo Borough	38	64.4%	\$3,212,200	\$4,834,100	66.4%
Newport Borough	304	51.4%	\$48,718,600	\$75,207,600	64.8%
Northeast Madison Township	200	34.4%	\$28,360,900	\$57,474,100	49.3%
Oliver Township	173	20.0%	\$12,085,200	\$88,977,700	13.6%
Penn Township	280	17.9%	\$56,528,600	\$248,983,400	22.7%
Rye Township	167	15.0%	\$21,455,100	\$139,070,700	15.4%
Saville Township	285	18.1%	\$27,785,700	\$139,731,100	19.9%
Southwest Madison Township	129	21.0%	\$11,821,500	\$57,003,700	20.7%
Spring Township	202	16.2%	\$25,361,200	\$164,530,600	15.4%
Toboyne Township	107	16.3%	\$11,044,600	\$49,094,100	22.5%
Tuscarora Township	158	18.6%	\$18,108,000	\$69,273,800	26.1%
Tyrone Township	259	24.1%	\$39,456,700	\$111,749,100	35.3%
Watts Township	130	20.2%	\$13,527,800	\$65,722,200	20.6%
Wheatfield Township	190	13.2%	\$11,793,200	\$144,698,600	8.2%
Perry County	5,082	20.7%	\$558,429,900	\$2,609,170,800	21.4%

SOURCE: TCRPC, 2020

A HAZUS-MH Flood Risk Assessment for Perry County's was performed as part of the 2018 Pennsylvania State Hazard Mitigation Plan. The scenario analyzed was a 100-year, or 1% annual chance flood. Table 4.73 below illustrates the building exposure by occupancy type. These results which are generated by HAZUS and they illustrate that impacts to residential structures represent approximately

55% of building losses in the Perry County flood scenario. The total economic impact related to building losses in Perry County is estimated to be more than \$109 million. HAZUS estimates there will be \$640,000 in impacts related to business interruptions such as lost income, relocation costs, lost rental income, and wages. Table 4.73 below presents the estimated building related economic losses from HAZUS.

**TABLE 4.73
BUILDING RELATED ECONOMIC LOSS ESTIMATES**

General Occupancy	Building Loss	Content Loss	Inventory Loss	Total Building Loss
Residential	\$41,760,000	\$18,760,000	\$0	\$60,520,000
Commercial	\$5,970,000	\$18,280,000	\$390,000	\$24,640,000
Industrial	\$4,470,000	\$10,000,000	\$1,420,000	\$15,900,000
Others	\$1,620,000	\$7,080,000	\$110,000	\$8,810,000
Total	\$53,830,000	\$54,120,000	\$1,930,000	\$109,870,000

Source: HAZUS-MH, 2018

HAZUS also estimates the amount of debris generated from flood scenarios. This can help local jurisdictions and other stakeholders prepare for debris management after flood occurs. HAZUS estimates 8,871 tons of debris will be generated as a result of a 100-year flood in Perry County. This can lead to significant economic impacts directly to the county and the municipalities by having to clear the debris either through labor expenditures and equipment usage or hire contractors to assist in the debris cleanup. Table 4.74 below illustrates the estimated debris generated through

**TABLE 4.74
DEBRIS GENERATION**

Debris Generated (Tons)	
Finishes	3,814
Structure	2,732
Foundation	2,325
Total	8,871

Source: HAZUS-MH, 2018

Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. A repetitive loss property may or may not be currently insured by NFIP.

The Perry County HMP attempts to reduce loss by identifying potential natural and manmade hazards. As a result of many natural and manmade hazards, repairs and reconstruction are often completed in a way that returns the structure to pre-disaster condition yet does little to prevent a reoccurrence of damage. Replication of the pre-disaster conditions allows for the repetitive cycle of property damage, reconstruction, and re-damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction are analyzed, and sound, less vulnerable conditions are produced. Additionally, other mitigation strategies may be considered, such as voluntary property buy-outs.

Flooding is the most common cause of repetitive loss in Perry County. Table 4.75 illustrates the number of repetitive loss properties, by municipality, for Perry County. According to this data, Perry County has a total of 78 repetitive loss properties spread throughout 14 of its 30 municipalities. Of the 78 recorded repetitive loss properties, 29 do not carry insurance. The combined property value for Perry County's repetitive loss properties is more than \$12.2 million. The potential loss of these properties could greatly impact the County. Due to privacy concerns, detailed information on these properties is retained by the Perry County Emergency Management office.

TABLE 4.75
REPETITIVE LOSS PROPERTIES

Municipality	Number of Repetitive Loss Properties	Insured	Not Insured	Combined Value	Non-Residential	Single Family	Multi-family
Carroll Township	3	-	3	\$470,576	-	3	-
Duncannon Borough	25	18	7	\$5,585,173	10	9	6
Greenwood Township	1	-	1	\$76,560	-	1	-
Howe Township	2	1	1	\$90,402	-	2	-
Liverpool Township	3	1	2	\$58,040	-	1	2
Marysville Borough	10	9	1	\$1,519,045	-	10	-
Miller Township	3	3	-	\$329,341	-	3	-
Millerstown Borough	1	1	-	\$73,440	-	1	-
Newport Borough	7	5	2	\$1,287,593	-	4	3

Penn Township	5	3	2	\$695,460	1	4	-
Spring Township	1	1	-	\$89,955	-	1	-
Tyrone Township	4	1	3	\$766,425	-	3	1
Watts Township	5	3	2	\$388,404	1	4	-
Wheatfield Township	8	3	5	\$834,965	-	8	-
Total	78	49	29	\$12,265,379	12	54	12

SOURCE: Federal Emergency Management Agency

Multi-Jurisdictional Risk Assessment

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction’s risk where they vary from the risks facing the entire planning area.

The top three hazards identified for Perry County in this plan are severe weather, flooding, and illegal drug activity (including opioid abuse). Flooding affects identifiable locations within the floodplain. However, flooding can also, like many other hazards, affect more than one jurisdiction simultaneously.

Flooding occurs along the creeks and river banks in Perry County. Communities along the Juniata River, Susquehanna River, Buffalo Creek, Fishing Creek, Little Juniata Creek, Sherman Creek, and other small tributaries of the Juniata and Susquehanna River face a flooding risk. The Juniata River and the Susquehanna River pose the greatest threat in the County. While most flooding events cannot be prevented, measures can be taken to limit the losses faced by areas prone to flooding. Refer to the Flooding Hazard Profile for more details on this hazard.

Of the other hazards identified, hazardous material spills are often centralized, occurring along major transportation routes. Within Perry County, there are two major transportation routes, both of which are located in the eastern portion of the County (U.S. Route 22/322 and U.S. Route 11/15). According to the U.S. Census Bureau, Perry County has the highest percentage of workers leaving their county of residence for work of any county in Pennsylvania. As residential development occurs and residents commute to surrounding areas, there will be more traffic on the rural roadways of Perry County, which will increase the potential for transportation incidents. Hazardous material spills stemming from transportation accidents endanger other drivers, local residents, and the environment through adverse driving conditions and pollutants. Refer to Appendix C – Transportation Hazard Profile and Hazardous Material Hazard Profile for more details on these hazards.

While certain hazards occur in a localized area, this does not negate the regional threat each of the identified hazards presents, directly or through secondary effects. First responders may be called upon to assist in incidents outside their municipal or county jurisdiction. Further, secondary effects of a localized hazard may have much greater, far-reaching effects, such as pollution of a regional water system or the closing of a major transportation route. Some areas may be more prone to certain hazards than others, yet regional impacts must be considered.

Future Development and Vulnerability

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of the land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Overview

An examination of recent development trends in Perry County can help identify and anticipate future vulnerabilities to hazards. The impact of these hazards may be affected by the County's growth and development.

Perry County is projected to see a population increase of 29.4 percent between 2000 and 2030. Significant growth of greater than 20 percent is projected for many of the townships in Perry County between 2000 and 2030. Carroll Township, in south central Perry County, is projected to see a population increase of more than 40 percent between 2000 and 2030, creating a population total greater than 7,000.

Based on Perry County's population per household, according to the 2000 U.S. Census, approximately 23,160 housing units are projected for the County by 2015. This represents a significant increase of 22.3 percent from 2000. Continued conformity with the State Building Codes and local land use ordinances will help to mitigate the effects hazards have on new development.

Impervious Surface Coverage

Impervious surface coverage data from 1985 and 2000 was analyzed to determine static development trends and developing areas in relation to corresponding hazards. This information was coupled with the 100-year floodplain dataset to show where development within the floodplain is occurring.

A comparison of impervious surface coverage data provides a logical method of detecting change in the Perry County growth and development patterns. Impervious surface data, estimated from Thematic Mapper data using algorithms developed by Dr. Toby Carlson at Penn State University, University Park, Pennsylvania, was originally generated to support hydrologic investigations. This data is also useful for assessing urbanization and development patterns over time. Impervious surfaces primarily reflect the urban and built environment that includes rooftops, sidewalks, roads, and parking lots.

By examining impervious surface data in Perry County, a certain level of vulnerability to certain hazards such as flooding and transportation incidents can be assumed. This may generate recommendations to examine certain areas in more detail to better mitigate specific hazardous threats, such as flooding.

Map 2.3 in Chapter 2 illustrates the change in impervious surface coverage from 1985 to 2000 in Perry County.

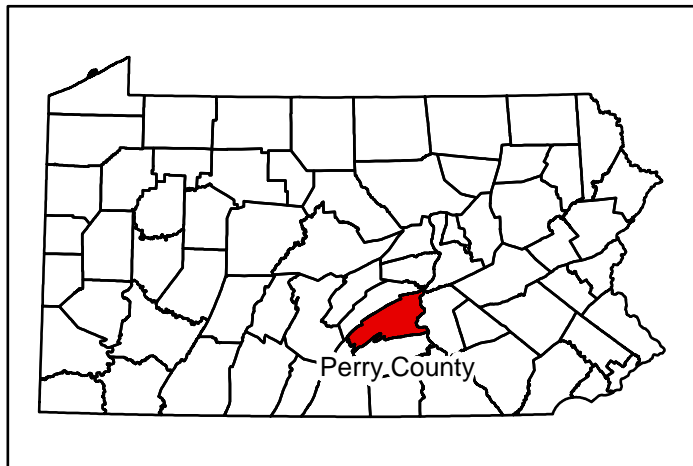
The impervious surface coverage map developed by the TCRPC in 2013, illustrates expanded development in and around our boroughs Bloomfield Borough, Duncannon Borough, and Marysville Borough. Much of the development in Perry County between 1985 and the present has been locational-sporadic despite encouraged guidance.

Development can often change the threat level of an area by placing additional critical facilities, businesses, transportation networks, and populations within vulnerable areas. Development in Newport Borough, Duncannon Borough, Liverpool Borough, New Buffalo Borough, and Marysville Borough has occurred near the floodplain along U.S. Route 11/15. Refer to Appendix C: Flooding Hazard Profile for a more detailed discussion of this hazard.

Another common hazard that is affected by development is transportation incidents. Population growth brings a greater demand for goods and services, which can put a strain on the transportation infrastructure. Growth has occurred near U.S. Route 11/15 and U.S. Route 22/322, the major transportation routes through Perry County. Most often, development occurs near existing transportation infrastructure because of ease of access to surrounding areas for goods, services, and employment. Therefore, with a greater population of drivers using the transportation network, transportation hazards are likely to increase. Refer to Appendix I for a more detailed discussion of these hazards.

While it can be difficult to curb development, it is to the municipalities' advantage to be aware of development trends in order to successfully mitigate future hazards as risks increase. Since local municipalities have enacted floodplain ordinances and building codes, future vulnerability to hazards will be minimized.

Location Map



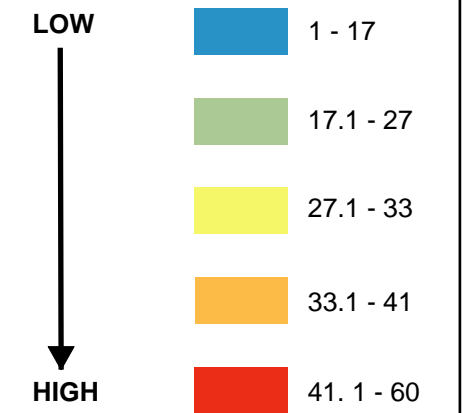
PERRY COUNTY RISK MAP

Perry County, Pennsylvania

LEGEND

The Perry County Hazard Risk map was created by allowing the public to vote on the hazards that they found most pressing. Features were then displayed by risk factor value and stacked. The combined values are as follows:

Risk Factor



Base Values Used:
 Flooding: 15 Transportation: 13.25
 Radon: 9.5 Urban Fire: 4
 Landslides: 2 Wildfire: 1



Prepared Date: February, 2019
 Prepared By: Tri-County Regional Planning Commission
 Source Data: PennDOT, Perry County GIS Dept., FEMA, USGS, EPA, & TCRPC

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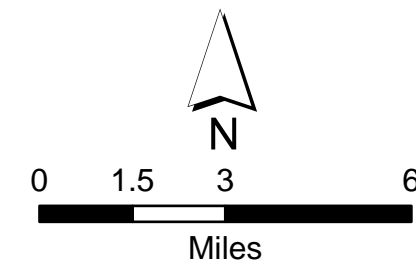
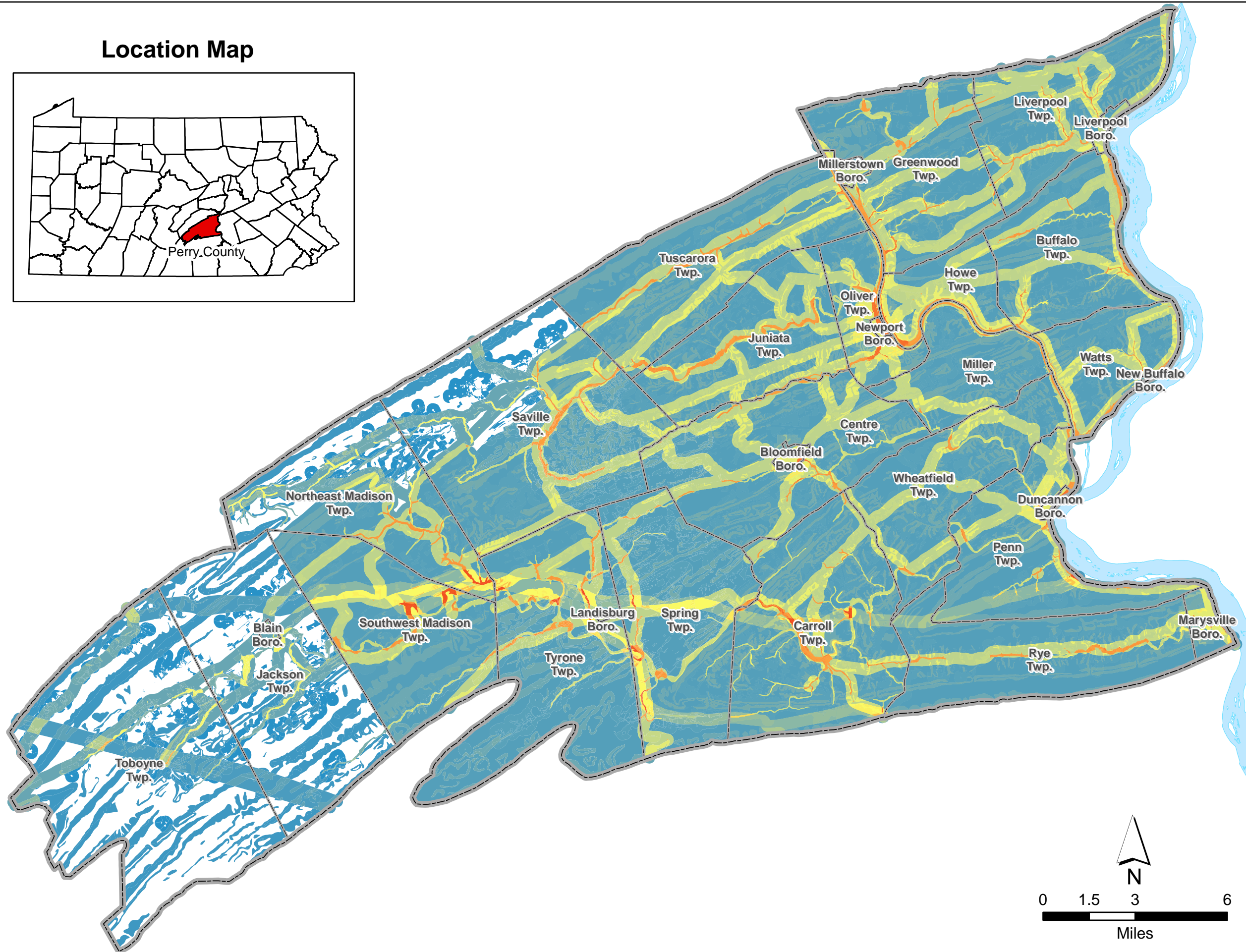


TABLE 4.1

PERRY COUNTY HAZARD RISK ASSESSMENT MATRIX

Hazard	Frequency of Occurrence	Likely location of event	Impact				Vulnerability							
			Critical Facilities (25% Vulnerability Factor)	Social (30% Vulnerability Factor)	Economic (25% Vulnerability Factor)	Environmental (20% Vulnerability Factor)	Risk Factor	(a) Health and Safety of Persons in the Affected Area at the Time of the Incident (Injury and Death)	(b) Health and Safety of Essential Personnel	(c) Continuity of Government	(d) Property, Facilities, and Infrastructure	(e) Delivery of Services	(f) The Environment	(g) Economic and Financial Condition
Civil Disorder/ Demonstrations	1	Civil Disorder or demonstrations happen often in places such as college campuses. However, the impact of these events is normally low. The County Prison in Bloomfield is the most likely location for civil disorder	1	1	1	1	1.00	Nominal impact to the health and safety of people in the affected area.	Nominal impact to first responders. Minor injury from physical confrontations.	Nominal and short-term impact on continuity of government operations.	Impact on property, facilities and infrastructure will likely result from acts of vandalism and will be nominal in scope.	Nominal impact on the delivery of services resulting from work stoppages.	Limited environmental impact unless acts of sabotage are performed.	Economic and financial impact to the community will be nominal.
Cyber Terrorism	2	This form of terrorism can take on many forms. Obviously fraud connected to corporate financial and private investment overshadows this list. Some other sinister pursuits have been with impacting election results.	3	4	3	1	5.80	This form of terrorism could pose concern for immediate impacts to the health and safety of persons affected in the targeted area if it is an attack on electric utilities.	This form of terrorism poses no immediate impact to the health and safety of essential personnel.	The effect of misinformation to those with a right to vote may adversely affect interest in the process and low future turnout in future years.	With theft by control of other equipment processes may be shut down with the intent to cause harm to a particular facility or a community at large.	Potential to divert deliveries.	Limited environmental impact except when the terrorism targets controls associated with the release of harmful materials, liquids or gas.	The vulnerability of a community or individuals economic and financial condition may vary depending upon the extent of the finances accessed during such an unauthorized access of an account(s).
Dam Failure	2	High hazard dams require Emergency Action Plans (EAP). Perry County has one high hazard dam. It does have a completed EAP. This high hazard dam at Little Buffalo Creek has the potential to have the greatest impact.	1	2	2	1	3.10	Generally low impact on health and safety. However, the catastrophic, unannounced breach of a high hazard dam could result in a substantial number of deaths and injuries.	Low impact to first responders. Primary threat comes from debris and possible hazardous materials contamination.	Low impact on continuity of government operations unless located in the inundation curve.	Vital lifelines (roads, gas, and water pipelines) may be damaged as a result of released waters.	Moderate impact on the delivery of services to the affected area.	Limited environmental impact that is contingent upon the nature of the inundation area. Urban environments will have higher potential to release hazardous materials.	Impact is contingent upon the nature of the event.

Drought -	5	According the PA Department of Environmental Protection, Perry County has been included in 45 state drought declarations since 1980. Drought is a county-wide hazard.	3	3	3	3	15.00	Limited impact. Severe drought conditions may require water rationing and distribution to affected communities.	N/A	Low impact to government. Prolonged drought periods may require the suspension of certain essential services.	Low impact to property, facilities, and infrastructure. Water utilities may lose pressure. Hydroelectric power generation could suffer.	Low impact to the delivery of services. Service providers may be required to make use of alternate water supplies.	Low impact. A reduction to ground water supplies creates situations conducive to sinkholes. Non-domestic animals may be impacted.	Long-term water shortages will have a high impact on agribusiness, public utilities and other industries reliant upon water for production (i.e., plastics) or services (i.e., landscaping).
Earthquake -	1	An reportable earthquake was experienced in 2012	1	1	1	1	1.00	Low impact exists for fatalities and injuries. Area of impact generally small.	Moderate impact. Protective actions required to protect responders from fire hazards and environmental concerns.	Low impact, unlikely to cause relocation of government operations	Low impact to the transportation infrastructure and displaced populations.	Low impact to the delivery of services. Services likely to be temporarily interrupted in the area of impact.	Low impact to area of operations, including animal life, due to limited extent of hazards.	Low impact to the economic and financial community. Primary impact will be to the repair or replacement of structures in the area of operations.
Extreme Temperatures	3	Countywide	2	4	2	2	7.80	This could have significant impacts to our county population especially ad the county's elderly population continues to increase in size. A prolonged event would prove harmful.	Blue collar workers having to work in the elements, are vulnerable for aggravating existing health conditions.	Low impact to government.	Property damage could be experienced with prolonged extreme heat.	Overuse of cooling units could cause rolling blackouts to the electric grid. Long cold periods of extremely cold temperatures may cause water and sewer lines to break.	The environment can experience impacts to plants animals and insects with extreme temperatures	Heating and cooling costs may adversely impact a business's bottom line or an individual's disposable income.
Forest Insects and Disease -	3	The invasive Hemlock Woolly Adelgid and Gypsy Moth Catipillar among others are present and monitored in Perry County	1	2	2	3	5.85	Low impact to the health and safety of the persons in the affected area. Long term impacts can be greater with deforestation.	Low impact to first responders.	Low impact to the continuity of operations.	Moderate impact to property, facilities, and infrastructure. Forest property will be greatly affected by an infestation.	Nominal impact to the delivery of services. Infestations can limit the supply of timber.	Moderate impact to the environment as infestations can destroy acres of forest land.	Moderate impact to the economy. The wood industry would be most affected.

Flooding	5	Perry County faces flooding annually. According to the National Climatic Data Center, Perry County has experienced 30 flood events since 1993. Municipalities along the Susquehanna River experience extensive flooding.	3	3	3	3	15.00	High impact. Potential for loss of life and injuries, especially in urbanized areas prone to flash flooding.	Potentially high impact to first responders involved in swift water rescue activities. Protective actions required to protect responders from hazards and environmental concerns.	Low impact, unlikely to cause relocation of government operations.	Moderate impact. Utility outages, transportation infrastructure closures, and isolated populations. Varying levels of damage to structures, particularly mobile homes.	Moderate disruption of basic life support systems, typically of short duration.	Environmental impact should be limited to the release of hazardous substances.	Depending on the scope and magnitude of flooding, longterm economic disruption is possible, especially among small businesses.
Hazardous Materials	5	According to the National Response Center, 24 HAZMAT incidents have occurred in Perry County between 1990 and 2007. HAZMAT incidents are most likely to occur on or near U.S. Route 11/15, and U.S. Route 322.	1	2	1	2	7.50	High impact to the health and safety of people living in the impacted area.	Protective actions required to protect responders from hazardous materials exposure.	Low impact to continuity of operations.	Moderate impact to property, facilities, and infrastructure.	Low impact to the delivery of services.	Moderate impact to the areas of highest concentration.	Low impact to the economic and financial community of the impacted area.
Hurricane, Tropical Storm and Nor'easter	4	Countywide	4	4	4	3	15.20	Protective actions required to protect persons in the affected area.	Protective actions required to protect essential personnel during Tropical Storms and Nor'easters	Depending upon impacts to principal government offices, the event may necessitate activation continuity of operations plan.	Low to severe impacts to property, facilities, and infrastructure.	Severe impacts to the delivery of services.	Severe impacts to the environment	Severe impacts to the economic and financial well-being of the impacted area.
Illegal Drug Activity (Including opioid abuse)	5	No area in the County is removed	1	3	1	1	8.00	Potential for significant impact to the health and safety of persons in the immediate vicinity of such a illegal drug - related incident.	High potential impact for first responders intervening in illegal drug deals and dealing with users of hallucinogens.	Nominal impact.	Nominal impact.	Repeated visits to such areas may unnecessarily stretch emergency service resources.	Such activity has a detrimental effect on the environment of the neighborhood.	Such activity could plague a neighborhood to the point where property values decline.

<p>Landslides</p>	<p>2</p>	<p>The Pennsylvania Department of Transportation estimates that spends \$10 million annually to repair roadways damaged by landslides throughout the Commonwealth. This is a county-wide hazard with the greatest impacts occurring along major transportation routes U.S. Routes 11/15 and 322.</p>	<p>1</p>	<p>1</p>	<p>1</p>	<p>1</p>	<p>2.00</p>	<p>Nominal impact to the health and safety of people in the affected area unless the landslide is both sudden and catastrophic.</p>	<p>Nominal impact to first responders.</p>	<p>Little or no impact on continuity of government operations.</p>	<p>Vital lifelines (roads, gas, and water pipelines) may be cut as a result of landslides.</p>	<p>Limited impact on the delivery of services.</p>	<p>Limited environmental impact unless the landslide shears pipelines or damages hazardous material storage facilities (above or below ground tanks, etc).</p>	<p>Limited economic and financial impact to the community unless road networks are extensively damaged.</p>
<p>Lightning Strike</p>	<p>1</p>	<p>Random - Countywide</p>	<p>1</p>	<p>1</p>	<p>1</p>	<p>1</p>	<p>1.00</p>	<p>Low to moderate impact provided people seek shelter out of the elements.</p>	<p>Adequate training is necessary for blue collar workers to protect themselves as essential personnel from lightening strikes</p>	<p>Low to moderate impact.</p>	<p>Site specific impacts. Low to moderate impact on property and facilities.</p>	<p>Site specific impacts. Low to moderate impact on the delivery of services.</p>	<p>Site specific impacts. Low environmental impact.</p>	<p>Site specific impacts. Low to moderate economic and financial impact.</p>
<p>Nuclear Event</p>	<p>1</p>	<p>Pennsylvania is home to Three Mile Island (TMI), the only nuclear power plant in U.S. history to experience an emergency classification level of General Emergency. Perry County is outside the 10 mile EPZ but within the 50 mile ingestion zone of the TMI facility.</p>	<p>2</p>	<p>3</p>	<p>3</p>	<p>4</p>	<p>2.95</p>	<p>Potential for significant impact to the health and safety of persons residing in the 10 mile emergency planning zone or 50 mile ingestion pathway zone.</p>	<p>Potential for significant impact. Protective actions and special equipment required to protect responders from radiation exposure.</p>	<p>Low impact to continuity of operations, depending upon the location of the incident. A design basis accident at TMI would have a catastrophic impact on state government operations.</p>	<p>Potentially catastrophic impact to property, facilities, and infrastructure resulting from radionuclide contamination.</p>	<p>Potentially high impact on the delivery of services in and to the affected area.</p>	<p>High impact to the areas of highest concentration of radiological particulate.</p>	<p>High impact to the economic and financial community of the impacted area. Potentially catastrophic impact on agribusiness resulting from radionuclide ingestion and product embargoing.</p>

<p>Public Health Emergency (Epidemic)</p>	<p>3</p>	<p>An avian Bird Flu outbreak in 1986 affected Schuylkill, Northumberland, and Snyder Counties, killing approximately 307,000 chickens and turkeys. This cost the Commonwealth an estimated \$650,000. Farms in Perry County are the most likely areas for infection.</p>	<p>1</p>	<p>3</p>	<p>5</p>	<p>1</p>	<p>7.80</p>	<p>Potential for significant impact on the general population.</p>	<p>Potential for significant impact on essential personnel. However, with precaution, low impact is expected.</p>	<p>Low impact on continuity of government</p>	<p>Potential for high impact on property, facilities, and infrastructure, including points of dispensing for Strategic National Stockpile pharmaceuticals.</p>	<p>Low impact on the delivery of services.</p>	<p>Low impact on the environment, unless outbreak of public health emergency would reach animal population and require culling.</p>	<p>A large outbreak could have high impact on the economy of the County.</p>
<p>Radon Exposure</p>	<p>5</p>	<p>No home is considered safe from radon until tested. In the first two years of Radon testing in Pennsylvania, approximately 59 percent of all homes tested were found to be contaminated by Radon and Radon products. This is a county-wide hazard.</p>	<p>1</p>	<p>3</p>	<p>1</p>	<p>2</p>	<p>9.00</p>	<p>Over time, impact can be severe. Excessive exposure to Radon is a known cause of lung cancer.</p>	<p>Low impact to first responders. Primary threat comes with exposure over an extended period of time.</p>	<p>Low impact on continuity of government.</p>	<p>Low physical impact on property and facilities. However, untreated high Radon levels can greatly lessen property value.</p>	<p>Low impact on delivery of services.</p>	<p>Radon can have a high impact on the environment if untreated.</p>	<p>Low impact unless high levels of Radon are detected and go untreated, which can severely decrease property value.</p>
<p>Severe Weather</p>	<p>5</p>	<p>Perry County is vulnerable to many types of severe weather. Severe weather's impact is county-wide.</p>	<p>2</p>	<p>2</p>	<p>2</p>	<p>1</p>	<p>9.00</p>	<p>Minimal local impact. Minimal potential for loss of life and injuries.</p>	<p>Protective actions require to protect responders from hazards, particularly downed power lines.</p>	<p>Limited impact, unlikely to cause relocation of government operations.</p>	<p>Moderate impact. Utility outages, transportation infrastructure closures, and isolated populations. Varying levels of damage to structures, particularly mobile homes.</p>	<p>Low impact. Local disruption of basic life support systems, typically of short duration.</p>	<p>Low impact on ecosystems.</p>	<p>Limited impact on financial and commercial systems.</p>
<p>Subsidence or Sinkholes</p>	<p>5</p>	<p>Subsidence related events occur several times a year with minimal impact. These events are a characteristic of karst topography that results from dissolution and collapse of carbonate rock, such as limestone and dolomite. Areas of Perry County with with carbonate rock are the most vulnerable.</p>	<p>1</p>	<p>2</p>	<p>1</p>	<p>1</p>	<p>6.50</p>	<p>Nominal impact to the health and safety of people in the affected area, as most events are not catastrophic in nature.</p>	<p>Nominal impact to first responders.</p>	<p>Little or no impact on continuity of government operations.</p>	<p>Vital lifelines (roads, gas and water pipelines) may be damaged as a result of subsidence.</p>	<p>Limited impact on the delivery of services.</p>	<p>Limited environmental impact unless the subsidence shears pipelines or damages hazardous material storage facilities (above or below ground tanks, etc).</p>	<p>Limited economic and financial impact to the community unless road networks are extensively damaged.</p>

<p>Terrorism, to include CBRNE (Chemical, Biological, Radiological, Nuclear, and Explosive)</p>	1	<p>No terroristic events have been recorded in Perry County. While terrorism attacks are not frequent, Pennsylvania has many targets of interest including political, industrial, historical, agricultural, and military. Farms and major transportation routes are the most likely targets in Perry County.</p>	3	3	3	3	3.00	<p>Moderate impact to the health and safety of people in the affected area.</p>	<p>Protective actions required to protect responders from chemical, nuclear, and biological hazard exposure.</p>	<p>Impact on continuity of operations can range from nominal to catastrophic and will be contingent upon the type and location of the terrorism event.</p>	<p>Impact on property, facilities, and infrastructure can range from nominal to catastrophic and will be contingent upon the type and location of the terrorism event.</p>	<p>Impact on the delivery of services can range from nominal to catastrophic and will be contingent upon the type and location of the terrorism event.</p>	<p>Environmental impact can range from nominal to catastrophic and will be contingent upon the type and location of the terrorism event.</p>	<p>Economic and financial impact to the community can range from nominal to catastrophic and will be contingent upon the type and location of the terrorism event.</p>
<p>Tornado, Wind Storm or Micro Burst</p>	2	<p>According to the National Climatic Data Center, Perry County has witnessed 3 tornados since 1967. Generally, flat, lowlying areas are most vulnerable to tornados.</p>	1	3	1	2	3.60	<p>Extensive impact in the affected area. Potential for mass fatalities and large number of injured.</p>	<p>Moderate impact. Personal protective equipment is required for emergency worker safety from downed utility lines, hazardous materials, and debris.</p>	<p>Locally affected government agencies may be forced to relocate some mission-critical operations.</p>	<p>Extensive local impact. Massive failures in electrical, communications, and other critical Infrastructure.</p>	<p>Extensive impact in the area of impact. Wide-spread, shortterm disruptions in basic life support services in affected areas. 911 systems temporarily overwhelmed.</p>	<p>Low impact on ecosystems</p>	<p>Limited impact on financial and commercial systems.</p>
<p>Transportation Accident</p>	5	<p>With U.S. Route 11/15 and U.S. Route 322 traveling through Perry County, transportation incidents occur annually, most often with minimal impacts. Airline, railway, and pipleline incidents are less frequent. Most transportation incidents occur along the major transportation routes.</p>	2	2	2	1	9.00	<p>Fatal accidents occur annually.</p>	<p>Nominal risk to first responders.</p>	<p>Low impact on continuity of government operations.</p>	<p>Moderate impact on property or infrastructure.</p>	<p>Nominal impact on the delivery of services</p>	<p>Environmental impact should be limited to the release of hazardous substances.</p>	<p>Nominal impact.</p>
<p>Urban Fire</p>	4	<p>Urban fires that involve one or more structures occur annually with varying impacts. More popluated areas of Perry County are most vulnerable to these events.</p>	2	2	2	1	7.20	<p>Urban structure fire-related deaths occur annually.</p>	<p>Moderate risk to emergency responders as a result of training and personal protective equipment.</p>	<p>Low impact on continuity of government operations.</p>	<p>Moderate impact on property or infrastructure, structures burned, and displaced populations.</p>	<p>Nominal impact on the delivery of services.</p>	<p>Environmental impact should be limited to the release of hazardous substances.</p>	<p>Nominal impact.</p>

Utilities Outage or Interruption	5	Power failures occur annually throughout Perry County with a minimal impact. Widespread power failures are associated with unusual weather events. This is a county-wide hazard.	2	2	2	1	9.00	Generally low impact on health and safety. However, long-term outages during extremely hot or cold weather can have secondary health consequences.	Nominal impact to first responders.	Low impact on continuity of government operations if emergency backup power sources are available.	Limited impact on property or infrastructure.	Prolonged outages may result in disruption of water/sewage treatment operations.	Environmental impact should be limited to the release of hazardous substances.	Protracted outages could result in substantial disruption of commerce and financial activities, as well as loss of revenue.
Winter Storm (Snow or Ice)	5	Perry County is vulnerable to severe winter weather. Severe winter weather can close businesses and schools and disrupt travel. Severe winter weather's impact is countywide.	2	2	2	1	9.00	Severe winter weather and freezing temperatures can result in hypothermia and other cold-related injuries, especially among the elderly. Snow removal activities can lead to an increase in mortality caused by coronary failure.	Low impact to emergency workers primarily from prolonged exposure to cold temperatures. Secondary danger from vehicular accidents.	Low impact to government. Prolonged severe cold weather periods may require the suspension of services such as public schools.	Low impact. The primary consequence of prolonged severe cold weather is loss of power related to excessive demand, and downed power lines resulting from ice storms.	Limited Impact. The impact to the service delivery would be to medical facilities, nursing homes, and assisted living facilities. Some government offices may be required to shut down.	Moderate impact. There would be limited overall impact to the electric grid.	Prolonged periods of extreme cold weather could have a major impact on business related heating costs and could lead to short-term fuel shortages and inflation of heating oil and natural gas prices.
Wildfire	1	According to the National Climatic Data Center, no significant wildfires have been recorded in Perry County. The size and impact of the incident depends on location, climate conditions, and the response. Rural areas of the County are most vulnerable to wildfire.	1	2	1	1	1.30	Low potential exists for fatalities and injuries.	Moderate impact. Protective actions required to protect responders from fire hazards.	Low impact, unlikely to cause relocation of government operations.	Low impact to the infrastructure.	Low impact to the delivery of services. Services likely to be temporarily interrupted in the area of impact.	Low impact to area of operations, including animal life, due to limited extent of fires.	Low impact to the economic and financial community. Primary impact will be to the replacement of structures in the area of operations.

Risk factor Algorithm

Risk Factor = Frequency x (.25 x (Critical Facilities) + .30 x (Social) + .25 x (Economic) + .20 x (Environmental))

RISK FACTOR INDEX

Impact	Risk Factor Range	Perception Regarding the Frequency of Occurrence and Likelihood of Event Based upon the Location
Catastrophic	18.00 - 25.00	Unacceptable
Extensive	12.00 – 17.99	Undesirable
High	6.10 – 11.99	Acceptable with review
Moderate	0.25 – 5.99	Acceptable without review
Low	0.00 - 0.24	Acceptable

CHAPTER 5

CAPABILITY ASSESSMENT

Update Process Summary

A critical facilities assessment survey was distributed to all thirty Perry County municipalities to reassess local capabilities as a contribution to hazard risk assessment. This capabilities evaluation the survey will be used to evaluate the abilities of the county and municipal government structure as it relates to legal/regulatory, administrative/technical, and fiscal, together with municipal facilities and services.

This revisit to the former capability assessment affords municipal officials the opportunity to revisit responses found in the 2014 Multi-Hazard Mitigation Plan (MHMP) and offer corrections worth noting. The capability evaluation is comprised of two key components. The first is an inventory of the county’s and municipalities’ together with their facilities, services, and policies. The second is an analysis of their capacity to execute them.

In this process county and municipal officials were requested to verify and update if necessary what was being undertaken to reduce losses, and identify the framework that is in place or should remain in place for the implementation of new mitigation actions. The information contained herein helps the county and municipalities evaluate alternative mitigation actions. By the same token, analyzing what the county and municipalities have the capacity to do provides a baseline of information similar to the basic studies component of the Perry County Comprehensive Plan. The resulting information reveals areas where the county and its municipalities can adjust or enhance their abilities to facilitate loss reduction.

The capabilities evaluation reveals the underlying ability of the county’s municipalities with respect to key areas of hazard mitigation. The resulting analysis from the response to this survey update which reveals what changes in Perry County and its municipalities have taken place since the last plan. This will be representative of how all involved have been able to grow capacity, and an understanding of where change or improvements are needed to facilitate loss reduction.

Each municipality was asked to review and return a copy of the capability assessment to the office signed with edits or acknowledging the tables were acceptable. Only 12 of our municipalities responded to this request. There responses are summarized as follows

Capability Assessment Findings

Planning and Regulatory Capability

The following table (TABLE 5.1) was Table 6 in the Capabilities Assessment survey set.

**TABLE 5.1
PLANNING AND REGULATORY CAPABILITY**

Municipality	Planning Commission	Zoning Ordinance	Comprehensive Plan	S&LD Approving Body	Act 537 Plan	**UCC Regulation
Blain Borough	No	No	Yes (2015)	County	No	Perry COG/ BIU
Bloomfield Borough	Yes	Yes (1980)	Yes (1975)	Municipality	Yes	Perry COG/ BIU
Buffalo Township	Yes	No	Yes (1995)	Municipality	No	Perry COG/ BIU

Carroll Township	Yes	Yes (2003)	Yes (1987)	Municipality	Yes	Perry COG/ BIU
Centre Township	Yes	No	No	Municipality	Yes	Perry COG/ BIU
Duncannon Borough	Yes	Yes (1996)	Yes (1984)	Municipality	Yes	Perry COG/ BIU
Greenwood Township	Yes	Yes (1997)	Yes (2008)	Municipality	No	Perry COG/ BIU
Howe Township	Yes	Yes (2016)	Yes (1988)	Municipality	Yes	Perry COG/ BIU
Jackson Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Juniata Township	Yes	Yes (1993)	Yes (1993)	Municipality	Yes	Perry COG/ BIU
Landisburg Borough	No	No	No	County	No	Perry COG/ BIU
Liverpool Borough	Yes	Yes (1991)	Yes (1973)	Municipality	Yes	Perry COG/ BIU
Liverpool Township	Yes	Yes (2002)	Yes (2002)	Municipality	Yes	Perry COG/ BIU
Marysville Borough	Yes	Yes (1995)	Yes (2003)	Municipality	Yes	Perry COG/ BIU
Miller Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Millerstown Borough	No	Yes (1997)	Yes (2008)	County	No	Perry COG/ BIU
New Buffalo Borough	No	No	Yes (1996)	County	Yes	Perry COG/ BIU
Newport Borough	Yes	Yes (2000)	Yes (1995)	Municipality	No	Perry COG/ BIU
Northeast Madison Township	No	No	Yes (2003)	County	No	Perry COG/ BIU
Oliver Township	Yes	No	Yes (2015)	Municipality	Yes	Perry COG/ BIU
Penn Township	Yes	Yes (2003)	Yes (2006)	Municipality	Yes	Perry COG/ BIU
Rye Township	Yes	Yes (2011)	Yes (1999)	Municipality	Yes	Perry COG/ BIU
Saville Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Southwest Madison Township	No	No	Yes (2003)	County	No	Perry COG/BIU
Spring Township	Yes	No	Yes (1991)	Municipality	No	Perry COG/ BIU
Toboyne Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Tuscarora Township	Yes	Yes (1992)	Yes (2008)	Municipality	Yes	Perry COG/ BIU
Tyrone Township	Yes	Yes (1996)	Yes (1995)	Municipality	Yes	Perry COG/BIU
Watts Township	Yes	Yes (2001)	Yes (1997)	Municipality	Yes	Perry COG/ BIU
Wheatfield Township	Yes	Yes (1993)	Yes (2013)	Municipality	No	Perry COG/ BIU

Administrative and Technical Capability

The following table (TABLE 5.2) was Table 3 in the Capabilities Assessment survey set.

Each municipality was asked to verify whether the following table correctly represents your municipality’s administrative and technical capabilities from the information contained in the 2014 MHMP. If you see any edits please make the corrections and advise our office of the same.

TABLE 5.2

ADMINISTRATIVE AND TECHNICAL CAPABILITY

Municipality	Planning Commission	Municipal Engineer	Personnel Skilled in GIS and/or HAZUS	Emergency Management Coordinator	Intergovernmental Cooperation
Perry County	Yes	Yes	Yes	Yes	Yes

Blain Borough	-	-	No	Yes	-
Bloomfield Borough	Yes	Yes	Yes (County)	Yes	-
Buffalo Township	Yes	Yes	No	Yes	Yes
Carroll Township	Yes	Yes	No	Yes	-
Centre Township	Yes	Yes	No	Yes	-
Duncannon Borough	Yes	Yes	Yes (County)	Yes	-
Greenwood Township	Yes	Yes	No	Yes	Yes
Howe Township	Yes	Yes	No	Yes	Yes
Jackson Township	-	-	No	Yes	-
Juniata Township	Yes	Yes	No	Yes	-
Landisburg Borough	-	-	Yes	Yes	County
Liverpool Borough	Yes	Yes	No	Yes	-
Liverpool Township	Yes	Yes	No	Yes	-
Marysville Borough	Yes	Yes	Yes (County)	Yes	Yes
Miller Township	Yes	Yes	No	Yes	-
Millerstown Borough	-	Yes	No	Yes	Yes
New Buffalo Borough	-	-	No	Yes	-
Newport Borough	Yes	Yes	Yes (County)	Yes	-
Northeast Madison Township	-	-	No	Yes	Yes
Oliver Township	Yes	Yes	No	Yes	-
Penn Township	Yes	Yes	No	Yes	-
Rye Township	Yes	Yes	No	Yes	-
Saville Township	Yes	Yes	No	Yes	-
Southwest Madison Township	-	-	Yes (County)	Yes	Yes
Spring Township	Yes	Yes	No	Yes	-
Toboyne Township	-	Yes	No	Yes	-
Tuscarora Township	Yes	Yes	No	Yes	Yes
Tyrone Township	Yes	Yes	No	Yes	-
Watts Township	Yes	Yes	No	Yes	Yes
Wheatfield Township	Yes	Yes	Yes (County)	Yes	County

Financial Capability

The following table (TABLE 5.3) was actually Table 4 in the Capabilities Assessment survey set.

Confirm whether the information provided below for your municipality in 2014 MHMP is correct and the municipality has access to, or is eligible for, the following financial resources to assist with hazard mitigation. Please edit where necessary and return this sheet.

TABLE 5.3

FINANCIAL CAPABILITY

Municipality	Federal and State Funding	Capital Improvements Financing	Authority to Levy Taxes for Specific Purposes	Incur Debt to General Obligation Bonds	Municipal Authorities	Member of Perry Council of Governments	Engineer Circuit Rider Program
Perry County	Yes	Yes	Yes	Yes	Yes	No	No
Blain Borough	-	-	-	-	Yes	Yes	-
Bloomfield Borough	Yes	Yes	Yes	Yes	Yes	Yes	-
Buffalo Township	-	-	-	-	No	Yes	-
Carroll Township	-	-	-	-	No	Yes	-
Centre Township	-	-	-	-	No	Yes	-
Duncannon Borough	-	Yes	Yes	Yes	Yes	No	No
Greenwood Township	-	-	-	-	No	Yes	-
Howe Township	-	-	-	-	Yes	Yes	-
Jackson Township	-	-	-	-	No	Yes	-
Juniata Township	-	-	-	-	No	Yes	-
Landisburg Borough	No	No	Yes	No	Yes	Yes	No
Liverpool Borough	-	-	-	-	Yes	Yes	-
Liverpool Township	-	-	-	-	No	Yes	-
Marysville Borough	Yes	-	Yes	Yes	No	Yes	No
Miller Township	-	-	-	-	Yes	Yes	-
Millerstown Borough	-	-	-	-	Yes	Yes	-
New Buffalo Borough	Yes	-	-	-	Yes	Yes	-
Newport Borough	Yes	-	-	-	Yes	Yes	-
Northeast Madison Township	-	-	-	-	No	Yes	-
Oliver Township	-	-	-	-	Yes	Yes	-
Penn Township	Eligible	Eligible	Eligible	Eligible	Yes	No	-
Rye Township	Eligible	Eligible	Eligible	Eligible	No	Yes	-
Saville Township	Yes	-	Yes	Yes	Yes	Yes	-
Southwest Madison Township	Eligible	No	Eligible	Eligible	No	Yes	No
Spring Township	Yes	No	Yes	-	No	Yes	-
Toboyne Township	Yes	Yes	Yes	No	No	Yes	-
Tuscarora Township	Eligible	Eligible	Yes	Eligible	Eligible	Eligible	Eligible
Tyrone Township	-	-	-	-	Yes	Yes	-
Watts Township	-	-	-	-	No	Yes	-
Wheatfield Township	Eligible	Yes	Yes	No	No	Yes	No

Education and Outreach

Each year, on the last Saturday in February, the Association of Township Officials holds its annual convention. This year marked the 106th year for the event. During this annual event guest speakers are requested to come in to present in educational training sessions.

The Tri-County Regional Planning Commission (TCRPC) offers up monthly Lunch and Learn Training webinars.

The TCRPC also conducts outreach on various planning subject matter for the county and municipalities. In 2019 this was their organization’s outreach schedule for Perry County.

Event 1

Date: January 2, 2019

Event: Greenwood Township Planning Commission

Location: Greenwood Township Municipal Building, 17 Pines Drive, Millerstown, PA 17062

Regional Planning Area (RPA): Northeastern Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 2

Date: January 8, 2019

Event: Multi-Hazard Mitigation Plan Steering Committee

Location: Perry County Commissioner’s Conference Room

Regional Planning Area (RPA): All

Presentation: Hazard Mitigation Plan Update Project; guidance from Steering Committee

Event 3

Date: January 9, 2019

Event: Miller Township Planning Commission

Location: Miller Township Municipal Building, 554 Old Limekiln Lane, Newport, PA 17074

Regional Planning Area (RPA): Northeastern Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 4

Date: January 10, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Latest Plans Received, County Impacting Transportation Projects, Regional Program Progress Report, and Comprehensive Plan implementation

Event 5

Date: January 14, 2019

Event: New Buffalo Borough Council

Location: Locust Street, New Buffalo, PA 17069

Regional Planning Area (RPA): Southeastern Perry RPA

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 6

Date: January 15, 2019 (Rescheduled date due to Multi-Hazard Mitigation Plan Steering Committee Meeting Conflict)

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 7

Date: January 23, 2019 – Tentative

Event: Amish Outreach (Cumberland County, South of I-81)

Regional Planning Area (RPA): Not Applicable – Cumberland County

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 8

Date: January 23, 2019

Event: Amish Outreach (Cumberland County, North of I-81)

Regional Planning Area (RPA): Not Applicable – Cumberland County

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 9

Date: January 30, 2019 - Tentative

Event: Amish Outreach (Dauphin County)

Regional Planning Area (RPA): Upper Dauphin

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 10

Date: February 4, 2019

Event: Buffalo Township Board of Supervisors

Location: 22 Cherry Road, Liverpool, PA 17045

Regional Planning Area (RPA): Northeastern Perry

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 11

Date: February 5, 2019

Event: Centre Township Board of Supervisors

Location: 2971 Cold Storage Road, New Bloomfield, PA 17068

Regional Planning Area (RPA): Western Perry

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 12

Date: February 6, 2019 - Tentative

Event: Amish Outreach (Perry County)

Regional Planning Area (RPA): Western Perry and Northeastern Perry

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 13

Date: February 7, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 14

Date: February 11, 2019

Event: Liverpool Borough Council

Location: Pine Street and Locust Street, Liverpool, PA 17045

Regional Planning Area (RPA): Northeastern Perry

Topics: Outreach to include Multi-Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 15

Date: February 12, 2019

Event: Tuscarora Township Planning Commission

Location: Tuscarora Township Municipal Building, 72 Cemetery Road, Millerstown, PA 17062

Regional Planning Area (RPA): Northeastern Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 16

Date: February 14, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Latest Plans Received, County Impacting Transportation Projects, Regional Program Progress Report, and Comprehensive Plan implementation

Event 17

Date: February 14, 2019

Event: Perry County COG and Boroughs Association

Location: Bloomfield Borough Municipal Building, New Bloomfield, PA

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 18

Date: February 23, 2019

Event: Perry County Township Supervisors Annual Convention

Location: Greenwood Area Elementary School, Millerstown, PA

Regional Planning Area (RPA): All

Presentation: Hazard Mitigation Plan Update Project

Event 19

Date: February 28, 2019

Event: Jackson Township Board of Supervisors

Location: Jackson Township Municipal Building, 890 Fowler Hollow Road, Blain, PA 17006

Regional Planning Area (RPA): Western Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 20

Date: March 5, 2019

Event: Hazard Mitigation Plan Steering Committee Meeting

Location: Perry County Commissioners Conference Room, 25 West Main Street, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Multi-Hazard Mitigation Plan

Event 21

Date: March 12, 2019

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 22

Date: March 12, 2019

Event: Duncannon Borough Planning Commission

Location: Duncannon Borough Council Chambers, 428 North High Street, Duncannon, PA 17020

Regional Planning Area (RPA): Southeastern Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 23

Date: March 14, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Latest Plans Received, County Impacting Transportation Projects, Regional Program Progress Report, and Comprehensive Plan implementation

Event 24

Date: March 19, 2019

Event: Tyrone Township Planning Commission

Location: Tyrone Township Municipal Building, 3129 Shermans Valley Road, Loysville, PA 17047

Regional Planning Area (RPA): Western Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 25

Date: March 28, 2019

Event: Howe Township Planning Commission

Location: Howe Township Municipal Building, 80 Red Hill Road, Newport, PA 17074

Regional Planning Area (RPA): Northeastern Perry RPA

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 26

Date: April 4, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 27

Date: April 4, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Latest Plans Received, County Impacting Transportation Projects, Regional Program Progress Report, and Comprehensive Plan implementation

Event 28

Date: May 9, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 29

Date: May 9, 2019

Event: Perry County COG and Boroughs Association

Location: Bloomfield Borough Municipal Building, New Bloomfield, PA

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 30

Date: May 14, 2019

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 31

Date: June 6, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 32

Date: June 13, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach to include Hazard Mitigation Plan Update Project, Perry County Comprehensive Plan Implementation, Highlights of the Perry Planning Work Program and Regional Program Progress Report

Event 33

Date: July 9, 2019

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 34

Date: July 11, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 35

Date: August 1, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 36

Date: August 8, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 37

Date: September 10, 2019

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 38

Date: September 12, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA

17068

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 39

Date: September 12, 2019

Event: Perry County COG and Boroughs Association

Location: Bloomfield Borough Municipal Building, New Bloomfield, PA

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 40

Date: October 3, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 41

Date: October 10, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 42

Date: November 12, 2019

Event: Natural Resources and Recreation Workgroup

Location: Perry County Conservation District Conference Room, 8 S. Carlisle Street, 2nd Floor, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 43

Date: November 14, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 44

Date: November 14, 2019

Event: Perry County COG and Boroughs Association

Location: Bloomfield Borough Municipal Building, New Bloomfield, PA

Regional Planning Area (RPA): All

Topics: Outreach on latest plans received, County impacting transportation projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Event 45

Date: October 5, 2019

Event: Economic Issues Workgroup

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Perry County Comprehensive Plan Implementation

Event 46

Date: December 12, 2019

Event: Perry County Economic Development Authority

Location: Perry County Business and Tourism Center, New Bloomfield Square, New Bloomfield, PA 17068

Regional Planning Area (RPA): All

Topics: Latest Plans Received, County Impacting Transportation Projects, MHMP, Regional Program Progress Report, and Comprehensive Plan implementation

Plan Integration

The pursuit is to integrate the HMP into other existing planning related processes. This can simply be accomplished by reference within the text other plans which share common direction through goals, objectives and/or strategies.

Requirement §201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.¹

Implementation with Consideration Afforded to Existing Programs

This plan update recognizes there are many other efforts that are actively attending to the prevention of hazards in and around Perry County. This includes the current hazard mitigation plans of each surrounding county. The same can be said for all county and municipal comprehensive plans especially through land use planning. From the natural hazard perspective, this plan heightens the importance of assuring the county comprehensive plan always guides county and municipal efforts in a way to redirect development away from high risk natural hazard areas.

Presently the Tri-County Regional Planning Commission's newsletter goes out to 1,832 subscribers. Case studies of successful efforts to protect hazard prone areas far too often go unheralded.

The TCRPC has also adopted two model ordinances for municipal use and assistance in developing provisions to protect sites from natural and manmade hazards. Aside from identifying these efforts integration needs to be constantly monitored.

This plan accepts the guidance of all previously established documents to the extent they are legally compliant in their efforts. It also leaves room for additional thoughts and advice from all emergency service professionals through their emergency service plans and initiatives.

On these same lines, it is as important for the county's municipalities continue to advance themselves by integrating hazard mitigation into the comprehensive plan development process or capital improvements programming. Moreover, actions like updating local regulations can assist with hazard avoidance or prevention. With adjustments to such regulations, comes a need for training considerations for ordinance administrators.

In the case of comprehensive planning, municipalities can adopt the county comprehensive plan for their use. To further encourage such consideration the county could look to develop its plan in a way to sub-regionally package the plan for its municipalities.

Surrounding County Hazard Mitigation Plans

Method

Each of the surrounding county hazard mitigation plans has been prepared to meet the base standards for document delivery as set by FEMA. This covers text content with an emphasis placed on public participation. In Perry County the process involves the investment of a significant amount of staff time, committed volunteers, agency cooperation, and the availability of external funding.

¹ Ibid

Maintenance Schedule

The 5-year update cycle is difficult for Perry County and other adjoining counties to stay current with updates. For counties with larger planning budgets and staffing these updates have been comparably easy to accomplish. Exiting year three of the plan, PDM grant applications should be submitted to FEMA.

The Perry County Comprehensive Plan*Method*

The Perry County Planning Commission (PCPC) is responsible for maintaining and updating the County Comprehensive Plan and the County Subdivision and Land Development Ordinance. On a monthly basis the Commission meets to discuss, and comment on planning related issues and review subdivision and land development plans. It uses this information to identify necessary revisions and to amend both the Comprehensive Plan and the Subdivision and Land Development Ordinance. The PCPC's meetings are open to the public and are advertised annually in accordance with the Pennsylvania Sunshine Act (65 PA C.S.A.). Of the 30 municipalities in Perry County, 21 have local comprehensive plans (See Chapter 17: Capabilities Assessment).

Technical assistance on community planning matters is provided to the PCPC and the County Board of Commissioners through the Perry County Planning Commission. The Planning Department administers the County Comprehensive Plan, along with the County Subdivision and Land Development Ordinance. The Planning Commission also performs technical reviews of municipal subdivision and land development plans, municipal floodplain ordinances, municipal stormwater management plans and ordinances, and other community planning and development matters.

Maintenance Schedule

From Article III of the Pennsylvania Municipalities Planning Code (Act 247 of 1968, as reenacted and amended) Perry County is required to adopt a comprehensive plan and update it at least every 10 years. The Disaster Mitigation Act of 2000 (DMA) requires a five-year update cycle for HMPs. By merging these requirements when possible, it will allow the County to improve integration of these planning processes and strengthen public participation in both efforts.

The current Perry County Comprehensive Plan was adopted on May 18, 2015. As written the plan provides general direction and conceptual design for the future of Perry County and all of its municipalities. As required by the Municipalities Planning Code, the Comprehensive Plan will need to be updated before May 18, 2025. At that time, recommendations from the MHMP can be incorporated into the document. In following, municipal plans should also integrate relevant changes from the MHMP.

Future plan update efforts will attempt to seek partnerships with municipalities to work with the county to develop a plan and future updates that will ultimately fill all local needs in this regard.

Tri-County Regional Planning Commission's (TCRPC) newsletter

The educational value it provides local citizens on planning related subject matter is unequalled in the PA Capital Region. Presently the distribution numbers reveal persons. What better way to continually inform the public and public servants of hazard prevention and mitigation efforts.

Method

As a continued effort to keep municipal officials and the public informed of planning activities in the region the TCRPC has continued to maintain a newsletter since 1970.

Maintenance Schedule

The TCRPC's newsletter is a tri-annual document usually distributed in April, August, and December. Contributors are not always staff members, and can occasionally be outside entities.

TCRPC Model Ordinances*Method*

At the center of many of the TCRPC's effort is the one to develop maintain advanced model zoning, subdivision and land development and other prescriptive ordinances. The pursuit to develop well-structured and uniform ordinance language for use at all levels of government is important for the public to gain an understanding of how the protections work to their benefit by protecting them. From the public service side, uniform ordinance wording can lead to uniform translation and understanding of the requirements.

Maintenance Schedule

As needed, updates should consider advancements in the planning field, legal standing. This method may also account for newly identified hazards the way the ordinance models have been structured to account for natural hazards.

Perry County Emergency Operations Plan*Method*

The Pennsylvania Emergency Management Services Code, 35 PA C.S. Sections 7701-7707, as amended, requires emergency operations plans (EOPs) to be prepared for each county and municipality. The Code further prescribes these plans be maintained and kept current. The Perry County Emergency Management Agency (EMA) is responsible for preparing and maintaining the County's EOP. The EOP covers both the County and municipal emergency management operations and procedures.

At a minimum the EOP is required to be reviewed biennially. A review of the plan is performed whenever portions of the plan are implemented or an emergency event or training exercise; changes are made where necessary. The resulting changes are in turn distributed to the County's local emergency management coordinators for their use and reference.

Maintenance Schedule

An annual review of the MHMP will be undertaken by the Steering Committee to keep an annual record of accomplishments during the year. Table 7.1 below identifies the four annual meetings that were held.

The Perry County Emergency Management Agency should reconsider the County's MHMP during its biennial review of the County EOP. Recommended changes to the MHMP could then be coordinated with the Hazard Mitigation Planning Steering Committee.

Plan Integration

The pursuit is to integrate the HMP into other existing planning related processes.

Requirement §201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.¹

Implementation with Consideration Afforded to Existing Programs

This plan update recognizes there are many other efforts that are actively attending to the prevention of hazards in and around Perry County. This includes the current hazard mitigation plans of each surrounding county. The same can be said for all county and municipal comprehensive plans especially through land use planning. From the natural hazard perspective, this plan heightens the importance of assuring the county comprehensive plan always guides county and municipal efforts in a way to redirect development away from high risk natural hazard areas.

Presently the Tri-County Regional Planning Commission's newsletter goes out to 1,832 subscribers. Case studies of successful efforts to protect hazard prone areas far too often go unheralded.

The TCRPC has also adopted two model ordinances for municipal use and assistance in developing provisions to protect sites from natural and manmade hazards. Aside from identifying these efforts integration needs to be constantly monitored.

This plan accepts the guidance of all previously established documents to the extent they are legally compliant in their efforts. It also leaves room for additional thoughts and advice from all emergency service professionals through their emergency service plans and initiatives.

On these same lines, it is as important for the county's municipalities continue to advance themselves by integrating hazard mitigation into the comprehensive plan development process or capital improvements programming. Moreover, actions like updating local regulations can assist with hazard avoidance or prevention. With adjustments to such regulations, comes a need for training considerations for ordinance administrators.

In the case of comprehensive planning, municipalities can adopt the county comprehensive plan for their use. To further encourage such consideration the county could look to develop its plan in a way to sub-regionally package the plan for its municipalities.

Surrounding County Hazard Mitigation Plans

Method

Each of the surrounding county hazard mitigation plans has been prepared to meet the base standards for document delivery as set by FEMA. This covers text content with an emphasis placed on public participation. In Perry County the process involves the investment of a significant amount of staff time, committed volunteers, agency cooperation, and the availability of external funding.

Maintenance Schedule

¹ Ibid

The 5-year update cycle is difficult for Perry County and other adjoining counties to stay current with updates. For counties with larger planning budgets and staffing these updates have been comparably easy to accomplish. Exiting year three of the plan, PDM grant applications should be submitted to FEMA.

The Perry County Comprehensive Plan

Method

The Perry County Planning Commission (PCPC) is responsible for maintaining and updating the County Comprehensive Plan and the County Subdivision and Land Development Ordinance. On a monthly basis the Commission meets to discuss, and comment on planning related issues and review subdivision and land development plans. It uses this information to identify necessary revisions and to amend both the Comprehensive Plan and the Subdivision and Land Development Ordinance. The PCPC's meetings are open to the public and are advertised annually in accordance with the Pennsylvania Sunshine Act (65 PA C.S.A.). Of the 30 municipalities in Perry County, 21 have local comprehensive plans (See Chapter 17: Capabilities Assessment).

Technical assistance on community planning matters is provided to the PCPC and the County Board of Commissioners through the Perry County Planning Commission. The Planning Department administers the County Comprehensive Plan, along with the County Subdivision and Land Development Ordinance. The Planning Commission also performs technical reviews of municipal subdivision and land development plans, municipal floodplain ordinances, municipal stormwater management plans and ordinances, and other community planning and development matters.

Maintenance Schedule

From Article III of the Pennsylvania Municipalities Planning Code (Act 247 of 1968, as reenacted and amended) Perry County is required to adopt a comprehensive plan and update it at least every 10 years. The Disaster Mitigation Act of 2000 (DMA) requires a five-year update cycle for HMPs. By merging these requirements when possible, it will allow the County to improve integration of these planning processes and strengthen public participation in both efforts.

The current Perry County Comprehensive Plan was adopted on February 26, 2007. As written the plan provides general direction and conceptual design for the future of Perry County and all of its municipalities. As required by the Municipalities Planning Code, the Comprehensive Plan will need to be updated in 2017. At that time, recommendations from the MHMP can be incorporated into the document. In following, municipal plans should also integrate relevant changes from the MHMP.

Future plan update efforts will attempt to seek partnerships with municipalities to work with the county to develop a plan and future updates that will ultimately fill all local needs in this regard.

Tri-County Regional Planning Commission's (TCRPC) newsletter

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Perry County Emergency Operations Plan

Method

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Maintenance Schedule

An annual review of the MHMP will be undertaken by the Steering Committee to keep an annual record of accomplishments during the year. Table 7.1 below identifies the four annual meetings that were held.

The Perry County Emergency Management Agency should reconsider the County’s MHMP during its biennial review of the County EOP. Recommended changes to the MHMP could then be coordinated with the Hazard Mitigation Planning Steering Committee.

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input checked="" type="checkbox"/>	Table 1	Floodplain ordinance, 141 adopted 2/8/78 Amended & FEMA/PEMA approved 275 adopted 6/2/09
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input checked="" type="checkbox"/>	Table 5	In process - expected completion 12/2019
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Karl L. Cless

Printed Name of Survey Respondent: Karl L. Cless

Telephone Number: 717-582-8888 Email Address: bloomfieldboro@nmax.net

Municipality Represented: Bloomfield Borough

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input checked="" type="checkbox"/>	Table 2	Local Emergency Operations Plan
<input checked="" type="checkbox"/>	Table 3	There is an Intergovernmental Cooperation Agreement
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Nancy Cangoli

Printed Name of Survey Respondent: Nancy Cangoli

Telephone Number: 717-444-3295 Email Address: buffalotwp@pa.net

Municipality Represented: Buffalo

Other Legal and Regulatory Capabilities to Deal with All Hazards - Table 2

The following table identifies the legal and regulatory authority found in Perry County to deal with all hazards from the information contained in the 2014 MHMP. Please determine whether the following information is correct and edit as where necessary.

Municipality	Capital Improvements Plan	Emergency Operations Plan	Post Disaster Recovery Plan	Post Disaster Recovery Ordinance
Perry County	No	Yes (County)	-	-
Blain Borough	-	Yes (County)	-	-
Bloomfield Borough	-	Yes (County)	-	-
Buffalo Township	-	Yes (County) <i>Local</i>	-	-
Carroll Township	-	Yes (County)	-	-
Centre Township	-	Yes (County)	-	-
Duncannon Borough	Yes (Local)	Yes (County)	-	-
Greenwood Township	-	Yes (County)	-	-
Howe Township	-	Yes (County)	-	-
Jackson Township	-	Yes (County)	-	-
Juniata Township	-	Yes (County)	-	-
Landisburg Borough	-	Yes (County)	-	-
Liverpool Borough	-	Yes (County)	-	-
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (County)	-	-
Miller Township	-	Yes (County)	-	-
Millerstown Borough	-	Yes (County)	-	-
New Buffalo Borough	-	Yes (County)	-	-
Newport Borough	-	Yes (County)	-	-
Northeast Madison Township	-	Yes (County)	-	-
Oliver Township	-	Yes (County)	-	-
Penn Township	-	Yes (County)	-	-
Rye Township	-	Yes (County)	-	-
Saville Township	-	Yes (County)	-	-
Southwest Madison Township	-	Yes (County)	-	-
Spring Township	-	Yes (County)	-	-
Toboyne Township	-	Yes (County)	-	-
Tuscarora Township	-	Yes (County)	-	-
Tyrone Township	-	Yes (County)	-	-
Watts Township	-	Yes (County)	-	-
Wheatfield Township	Yes (State)	Yes (County)	-	-

Administrative and Technical Capabilities – Table 3

Verify whether the following table correctly represents your municipality's administrative and technical capabilities from the information contained in the 2014 MHMP. If you see any edits please make the corrections and advise our office of the same.

Municipality	Planning Commission	Municipal Engineer	Personnel Skilled in GIS and/or HAZUS	Emergency Management Coordinator	Intergovernmental Cooperation
Perry County	Yes	Yes	Yes	Yes	Yes
Blain Borough	-	-	No	Yes	-
Bloomfield Borough	Yes	Yes	Yes (County)	Yes	-
Buffalo Township	Yes	Yes	No	Yes	- YES
Carroll Township	Yes	Yes	No	Yes	-
Centre Township	Yes	Yes	No	Yes	-
Duncannon Borough	Yes	Yes	Yes (County)	Yes	-
Greenwood Township	Yes	Yes	No	Yes	Yes
Howe Township	Yes	Yes	No	Yes	-
Jackson Township	-	-	No	Yes	-
Juniata Township	Yes	Yes	No	Yes	-
Landisburg Borough	-	-	Yes	Yes	County
Liverpool Borough	Yes	Yes	No	Yes	-
Liverpool Township	Yes	Yes	No	Yes	-
Marysville Borough	Yes	Yes	Yes (County)	Yes	Yes
Miller Township	Yes	Yes	No	Yes	-
Millerstown Borough	-	Yes	No	Yes	Yes
New Buffalo Borough	-	-	No	Yes	-
Newport Borough	Yes	Yes	Yes (County)	Yes	-
Northeast Madison Township	-	-	No	Yes	Yes
Oliver Township	Yes	Yes	No	Yes	-
Penn Township	Yes	Yes	No	Yes	-
Rye Township	Yes	Yes	No	Yes	-
Saville Township	Yes	Yes	No	Yes	-
Southwest Madison Township	-	-	Yes (County)	Yes	Yes
Spring Township	Yes	Yes	No	Yes	-
Toboyne Township	-	Yes	No	Yes	-
Tuscarora Township	Yes	Yes	No	Yes	Yes
Tyrone Township	Yes	Yes	No	Yes	-
Watts Township	Yes	Yes	No	Yes	-
Wheatfield Township	Yes	Yes	Yes (County)	Yes	County

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

 YES X NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Katy Black

Printed Name of Survey Respondent: Katy Black

Telephone Number: 717-589-7204 Email Address: kblack@pa.net

Municipality Represented: Greenwood Township

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input checked="" type="checkbox"/>	Table 1	Howe Twp does have a Floodplain Ordinance
<input type="checkbox"/>	Table 2	
<input checked="" type="checkbox"/>	Table 3	We do have Intergovernmental Cooperation Agreement
<input checked="" type="checkbox"/>	Table 4	There is a Municipal Authority - Howe Township Municipal Authority
<input type="checkbox"/>	Table 5	
<input checked="" type="checkbox"/>	Table 6	Zoning Ord - 2016 Comprehensive Plan - County

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Nancy Cangoli

Printed Name of Survey Respondent: Nancy Cangoli

Telephone Number: 717-444-3045 Email Address: howetwp@pa.net

Municipality Represented: Howe

Legal and Regulatory Capabilities Mitigating Flood Hazards - Table 1

The following table identifies the legal and regulatory authority found in Perry County to deal with its principle hazard, flooding and is from the information contained in the 2014 MHMP.

Municipality	Floodplain Ordinance	National Flood Insurance Members	Stormwater Management Plan (Act 167)	Stormwater Management Ordinance
Perry County	-	Yes (Local)	No	No
Blain Borough	-	Yes (Local)	-	-
Bloomfield Borough	-	Yes (Local)	-	-
Buffalo Township	Yes (Local)	Yes (Local)	-	-
Carroll Township	-	Yes (Local)	-	-
Centre Township	-	Yes (Local)	-	-
Duncannon Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Greenwood Township	Yes (Local)	Yes (Local)	-	-
Howe Township	YES - LOCAL	Yes (Local)	-	-
Jackson Township	-	Yes (Local)	-	-
Juniata Township	-	Yes (Local)	-	-
Landisburg Borough	Yes (State)	Yes (State)	-	Yes (State)
Liverpool Borough	Yes	Yes (Local)	-	Yes
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Miller Township	-	Yes (Local)	-	-
Millerstown Borough	-	Yes (Local)	-	-
New Buffalo Borough	-	Yes (Local)	-	-
Newport Borough	-	Yes (Local)	-	-
Northeast Madison Township	-	Yes (Local)	-	-
Oliver Township	-	Yes (Local)	-	-
Penn Township	Yes (Local)	Yes (Local)	-	Yes (Local)
Rye Township	Yes	Yes (Local)	-	Yes
Saville Township	-	Yes (Local)	-	-
Southwest Madison Township	-	Yes (Local)	-	-
Spring Township	-	Yes (Local)	-	-
Toboyne Township	-	Yes (Local)	-	-
Tuscarora Township	-	Yes (Local)	-	-
Tyrone Township	-	Yes (Local)	-	-
Watts Township	-	Yes (Local)	-	-
Wheatfield Township	Yes (Local)	Yes (State)	-	Yes (Local)

Administrative and Technical Capabilities – Table 3

Verify whether the following table correctly represents your municipality’s administrative and technical capabilities from the information contained in the 2014 MHMP. If you see any edits please make the corrections and advise our office of the same.

Municipality	Planning Commission	Municipal Engineer	Personnel Skilled in GIS and/or HAZUS	Emergency Management Coordinator	Intergovernmental Cooperation
Perry County	Yes	Yes	Yes	Yes	Yes
Blain Borough	-	-	No	Yes	-
Bloomfield Borough	Yes	Yes	Yes (County)	Yes	-
Buffalo Township	Yes	Yes	No	Yes	-
Carroll Township	Yes	Yes	No	Yes	-
Centre Township	Yes	Yes	No	Yes	-
Duncannon Borough	Yes	Yes	Yes (County)	Yes	-
Greenwood Township	Yes	Yes	No	Yes	Yes
Howe Township	Yes	Yes	No	Yes	YES
Jackson Township	-	-	No	Yes	-
Juniata Township	Yes	Yes	No	Yes	-
Landisburg Borough	-	-	Yes	Yes	County
Liverpool Borough	Yes	Yes	No	Yes	-
Liverpool Township	Yes	Yes	No	Yes	-
Marysville Borough	Yes	Yes	Yes (County)	Yes	Yes
Miller Township	Yes	Yes	No	Yes	-
Millerstown Borough	-	Yes	No	Yes	Yes
New Buffalo Borough	-	-	No	Yes	-
Newport Borough	Yes	Yes	Yes (County)	Yes	-
Northeast Madison Township	-	-	No	Yes	Yes
Oliver Township	Yes	Yes	No	Yes	-
Penn Township	Yes	Yes	No	Yes	-
Rye Township	Yes	Yes	No	Yes	-
Saville Township	Yes	Yes	No	Yes	-
Southwest Madison Township	-	-	Yes (County)	Yes	Yes
Spring Township	Yes	Yes	No	Yes	-
Toboyne Township	-	Yes	No	Yes	-
Tuscarora Township	Yes	Yes	No	Yes	Yes
Tyrone Township	Yes	Yes	No	Yes	-
Watts Township	Yes	Yes	No	Yes	-
Wheatfield Township	Yes	Yes	Yes (County)	Yes	County

Fiscal Capabilities - Table 4

Confirm whether the information provided below for your municipality in 2014 MHMP is correct and the municipality has access to, or is eligible for, the following financial resources to assist with hazard mitigation. Please edit where necessary and return this sheet.

Municipality	Federal and State Funding	Capital Improvements Financing	Authority to Levy Taxes for Specific Purposes	Incur Debt to General Obligation Bonds	Municipal Authorities	Member of Perry Council of Governments	Engineer Circuit Rider Program
Perry County	Yes	Yes	Yes	Yes	Yes	No	No
Blain Borough	-	-	-	-	Yes	Yes	-
Bloomfield Borough	Yes	Yes	Yes	Yes	Yes	Yes	-
Buffalo Township	-	-	-	-	No	Yes	-
Carroll Township	-	-	-	-	No	Yes	-
Centre Township	-	-	-	-	No	Yes	-
Duncannon Borough	-	Yes	Yes	Yes	Yes	No	No
Greenwood Township	-	-	-	-	No	Yes	-
Howe Township	-	-	-	-	No YES	Yes	-
Jackson Township	-	-	-	-	No	Yes	-
Juniata Township	-	-	-	-	No	Yes	-
Landisburg Borough	No	No	Yes	No	Yes	Yes	No
Liverpool Borough	-	-	-	-	Yes	Yes	-
Liverpool Township	-	-	-	-	No	Yes	-
Marysville Borough	Yes	-	Yes	Yes	No	Yes	No
Miller Township	-	-	-	-	Yes	Yes	-
Millerstown Borough	-	-	-	-	Yes	Yes	-
New Buffalo Borough	Yes	-	-	-	Yes	Yes	-
Newport Borough	Yes	-	-	-	Yes	Yes	-
Northeast Madison Township	-	-	-	-	No	Yes	-
Oliver Township	-	-	-	-	Yes	Yes	-
Penn Township	Eligible	Eligible	Eligible	Eligible	Yes	No	-
Rye Township	Eligible	Eligible	Eligible	Eligible	No	Yes	-
Saville Township	Yes	-	Yes	Yes	Yes	Yes	-
Southwest Madison Township	Eligible	No	Eligible	Eligible	No	Yes	No
Spring Township	Yes	No	Yes	-	No	Yes	-
Toboyne Township	Yes	Yes	Yes	No	No	Yes	-
Tuscarora Township	Eligible	Eligible	Yes	Eligible	Eligible	Eligible	Eligible
Tyrone Township	-	-	-	-	Yes	Yes	-
Watts Township	-	-	-	-	No	Yes	-
Wheatfield Township	Eligible	Yes	Yes	No	No	Yes	No

Planning Capabilities - Table 6

Confirm whether the following information from the 2017 Perry County Planning Commission’s Annual Report is correct for your municipality, as the table will be included with this plan update. If you see any edits to this table, please advise us of the corrections.

Municipality	Planning Commission	Zoning Ordinance	Comprehensive Plan	S&LD Approving Body	Act 537 Plan	**UCC Regulation
Blain Borough	No	No	Yes (2015)	County	No	Perry COG/ BIU
Bloomfield Borough	Yes	Yes (1980)	Yes (1975)	Municipality	Yes	Perry COG/ BIU
Buffalo Township	Yes	No	Yes (1995)	Municipality	No	Perry COG/ BIU
Carroll Township	Yes	Yes (2003)	Yes (1987)	Municipality	Yes	Perry COG/ BIU
Centre Township	Yes	No	No	Municipality	Yes	Perry COG/ BIU
Duncannon Borough	Yes	Yes (1996)	Yes (1984)	Municipality	Yes	Glance Assoc., Inc.
Greenwood Township	Yes	Yes (1997)	Yes (2008)	Municipality	No	Perry COG/ BIU
Howe Township	Yes	Yes (1998) 2016	Yes (1988)	Municipality	No YES	Perry COG/ BIU
Jackson Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Juniata Township	Yes	Yes (1993)	Yes (1993)	Municipality	Yes	Perry COG/ BIU
Landisburg Borough	No	No	No	County	No	Perry COG/ BIU
Liverpool Borough	Yes	Yes (1991)	Yes (1973)	Municipality	Yes	Perry COG/ BIU
Liverpool Township	Yes	Yes (2002)	Yes (2002)	Municipality	Yes	Perry COG/ BIU
Marysville Borough	Yes	Yes (1995)	Yes (2003)	Municipality	Yes	Perry COG/ BIU
Miller Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Millerstown Borough	No	Yes (1997)	Yes (2008)	County	No	Perry COG/ BIU
New Buffalo Borough	No	No	Yes (1996)	County	Yes	Perry COG/ BIU
Newport Borough	Yes	Yes (2000)	Yes (1995)	Municipality	No	Perry COG/ BIU
Northeast Madison Township	No	No	Yes (2003)	County	No	Perry COG/ BIU
Oliver Township	Yes	No	Yes (2015)	Municipality	Yes	Perry COG/ BIU
Penn Township	Yes	Yes (2003)	Yes (2006)	Municipality	Yes	Glance Assoc., Inc.
Rye Township	Yes	Yes (2011)	Yes (1999)	Municipality	Yes	Perry COG/ BIU
Saville Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Southwest Madison Township	No	No	Yes (2003)	County	No	Perry COG/ BIU
Spring Township	Yes	No	Yes (1991)	Municipality	No	Perry COG/ BIU
Toboyne Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Tuscarora Township	Yes	Yes (1992)	Yes (2008)	Municipality	Yes	Perry COG/ BIU
Tyrone Township	Yes	Yes (1996)	Yes (1995)	Municipality	Yes	Perry COG/ BIU
Watts Township	Yes	Yes (2001)	Yes (1997)	Municipality	No	Perry COG/ BIU
Wheatfield Township	Yes	Yes (1993)	Yes (1974)	Municipality	No	“Opted Out”***

Source: Perry County Planning Commission/ TCRPC Staff

* County acts on all subdivisions but borough zoning regulations apply and override county lot sizes, areas and setbacks

** UCC—Uniform Construction Code

*** “Opted Out” - “If a municipality opts out, its... responsibilities under the UCC are to notify applicants for building permits that they must contract with certified third party agencies for residential permits and inspections or, if commercial construction is involved, secure permits and inspections from the Pennsylvania Department of Labor and Industry.”

(Year) – Year of latest ordinance or plan

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

_____ YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Jacob Baughman

Printed Name of Survey Respondent: Jacob Baughman

Telephone Number: 717-877-5107 Email Address: jakebaughman@hotmail.com

Municipality Represented: Landisburg Borough

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

_____ YES X NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Tanya Matter

Printed Name of Survey Respondent: Tanya Matter

Telephone Number: 717-444-3994 Email Address: lborough@pa.net

Municipality Represented: Liverpool Borough

Perry County MHMP

Capabilities Evaluation Survey

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

_____ YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Scott Weaver

Printed Name of Survey Respondent: Scott Weaver

Telephone Number: 717-957-3110 Email Address: Sweaver17053@comcast.net

Municipality Represented: Borough of Marysville

Perry County MHMP

Capabilities Evaluation Survey

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

___ YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Joyce D. Stultz

Printed Name of Survey Respondent: JOYCE L. STULTZ

Telephone Number: 717-567-9730 Email Address: MILLERTWP@EMBARQMAIL.COM

Municipality Represented: MILLER

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
 (Please select either YES or NO)

X YES ___ NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input checked="" type="checkbox"/>	Table 1	
<input checked="" type="checkbox"/>	Table 2	
<input checked="" type="checkbox"/>	Table 3	
<input checked="" type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Karen Knellinger, Sec./Treas.

Printed Name of Survey Respondent: Karen Knellinger

Telephone Number: 717-589-3738 Email Address: mboro1@embargo@mail.com

Municipality Represented: Millerstown Borough

Legal and Regulatory Capabilities Mitigating Flood Hazards - Table 1

The following table identifies the legal and regulatory authority found in Perry County to deal with its principle hazard, flooding and is from the information contained in the 2014 MHMP.

Municipality	Floodplain Ordinance	National Flood Insurance Members	Stormwater Management Plan (Act 167)	Stormwater Management Ordinance
Perry County	-	Yes (Local)	No	No
Blain Borough	-	Yes (Local)	-	-
Bloomfield Borough	-	Yes (Local)	-	-
Buffalo Township	Yes (Local)	Yes (Local)	-	-
Carroll Township	-	Yes (Local)	-	-
Centre Township	-	Yes (Local)	-	-
Duncannon Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Greenwood Township	Yes (Local)	Yes (Local)	-	-
Howe Township	-	Yes (Local)	-	-
Jackson Township	-	Yes (Local)	-	-
Juniata Township	-	Yes (Local)	-	-
Landisburg Borough	Yes (State)	Yes (State)	-	Yes (State)
Liverpool Borough	Yes	Yes (Local)	-	Yes
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Miller Township	-	Yes (Local)	-	-
Millerstown Borough	Yes	Yes (Local)	NO	NO
New Buffalo Borough	-	Yes (Local)	-	-
Newport Borough	-	Yes (Local)	-	-
Northeast Madison Township	-	Yes (Local)	-	-
Oliver Township	-	Yes (Local)	-	-
Penn Township	Yes (Local)	Yes (Local)	-	Yes (Local)
Rye Township	Yes	Yes (Local)	-	Yes
Saville Township	-	Yes (Local)	-	-
Southwest Madison Township	-	Yes (Local)	-	-
Spring Township	-	Yes (Local)	-	-
Toboyne Township	-	Yes (Local)	-	-
Tuscarora Township	-	Yes (Local)	-	-
Tyrone Township	-	Yes (Local)	-	-
Watts Township	-	Yes (Local)	-	-
Wheatfield Township	Yes (Local)	Yes (State)	-	Yes (Local)

Other Legal and Regulatory Capabilities to Deal with All Hazards - Table 2

The following table identifies the legal and regulatory authority found in Perry County to deal with all hazards from the information contained in the 2014 MHMP. Please determine whether the following information is correct and edit as where necessary.

Municipality	Capital Improvements Plan	Emergency Operations Plan	Post Disaster Recovery Plan	Post Disaster Recovery Ordinance
Perry County	No	Yes (County)	-	-
Blain Borough	-	Yes (County)	-	-
Bloomfield Borough	-	Yes (County)	-	-
Buffalo Township	-	Yes (County)	-	-
Carroll Township	-	Yes (County)	-	-
Centre Township	-	Yes (County)	-	-
Duncannon Borough	Yes (Local)	Yes (County)	-	-
Greenwood Township	-	Yes (County)	-	-
Howe Township	-	Yes (County)	-	-
Jackson Township	-	Yes (County)	-	-
Juniata Township	-	Yes (County)	-	-
Landisburg Borough	-	Yes (County)	-	-
Liverpool Borough	-	Yes (County)	-	-
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (County)	-	-
Miller Township	-	Yes (County)	-	-
Millerstown Borough	<i>Sewer Plant</i>	Yes (County)	-	-
New Buffalo Borough	-	Yes (County)	-	-
Newport Borough	-	Yes (County)	-	-
Northeast Madison Township	-	Yes (County)	-	-
Oliver Township	-	Yes (County)	-	-
Penn Township	-	Yes (County)	-	-
Rye Township	-	Yes (County)	-	-
Saville Township	-	Yes (County)	-	-
Southwest Madison Township	-	Yes (County)	-	-
Spring Township	-	Yes (County)	-	-
Toboyne Township	-	Yes (County)	-	-
Tuscarora Township	-	Yes (County)	-	-
Tyrone Township	-	Yes (County)	-	-
Watts Township	-	Yes (County)	-	-
Wheatfield Township	Yes (State)	Yes (County)	-	-

Administrative and Technical Capabilities – Table 3

Verify whether the following table correctly represents your municipality’s administrative and technical capabilities from the information contained in the 2014 MHMP. If you see any edits please make the corrections and advise our office of the same.

Municipality	Planning Commission	Municipal Engineer	Personnel Skilled in GIS and/or HAZUS	Emergency Management Coordinator	Intergovernmental Cooperation
Perry County	Yes	Yes	Yes	Yes	Yes
Blain Borough	-	-	No	Yes	-
Bloomfield Borough	Yes	Yes	Yes (County)	Yes	-
Buffalo Township	Yes	Yes	No	Yes	-
Carroll Township	Yes	Yes	No	Yes	-
Centre Township	Yes	Yes	No	Yes	-
Duncannon Borough	Yes	Yes	Yes (County)	Yes	-
Greenwood Township	Yes	Yes	No	Yes	Yes
Howe Township	Yes	Yes	No	Yes	-
Jackson Township	-	-	No	Yes	-
Juniata Township	Yes	Yes	No	Yes	-
Landisburg Borough	-	-	Yes	Yes	County
Liverpool Borough	Yes	Yes	No	Yes	-
Liverpool Township	Yes	Yes	No	Yes	-
Marysville Borough	Yes	Yes	Yes (County)	Yes	Yes
Miller Township	Yes	Yes	No	Yes	-
Millerstown Borough	No Yes	Yes	Yes	Yes	Yes
New Buffalo Borough	-	-	No	Yes	-
Newport Borough	Yes	Yes	Yes (County)	Yes	-
Northeast Madison Township	-	-	No	Yes	Yes
Oliver Township	Yes	Yes	No	Yes	-
Penn Township	Yes	Yes	No	Yes	-
Rye Township	Yes	Yes	No	Yes	-
Saville Township	Yes	Yes	No	Yes	-
Southwest Madison Township	-	-	Yes (County)	Yes	Yes
Spring Township	Yes	Yes	No	Yes	-
Toboyne Township	-	Yes	No	Yes	-
Tuscarora Township	Yes	Yes	No	Yes	Yes
Tyrone Township	Yes	Yes	No	Yes	-
Watts Township	Yes	Yes	No	Yes	-
Wheatfield Township	Yes	Yes	Yes (County)	Yes	County

Fiscal Capabilities - Table 4

Confirm whether the information provided below for your municipality in 2014 MHMP is correct and the municipality has access to, or is eligible for, the following financial resources to assist with hazard mitigation. Please edit where necessary and return this sheet.

Municipality	Federal and State Funding	Capital Improvements Financing	Authority to Levy Taxes for Specific Purposes	Incur Debt to General Obligation Bonds	Municipal Authorities	Member of Perry Council of Governments	Engineer Circuit Rider Program
Perry County	Yes	Yes	Yes	Yes	Yes	No	No
Blain Borough	-	-	-	-	Yes	Yes	-
Bloomfield Borough	Yes	Yes	Yes	Yes	Yes	Yes	-
Buffalo Township	-	-	-	-	No	Yes	-
Carroll Township	-	-	-	-	No	Yes	-
Centre Township	-	-	-	-	No	Yes	-
Duncannon Borough	-	Yes	Yes	Yes	Yes	No	No
Greenwood Township	-	-	-	-	No	Yes	-
Howe Township	-	-	-	-	No	Yes	-
Jackson Township	-	-	-	-	No	Yes	-
Juniata Township	-	-	-	-	No	Yes	-
Landisburg Borough	No	No	Yes	No	Yes	Yes	No
Liverpool Borough	-	-	-	-	Yes	Yes	-
Liverpool Township	-	-	-	-	No	Yes	-
Marysville Borough	Yes	-	Yes	Yes	No	Yes	No
Miller Township	-	-	-	-	Yes	Yes	-
Millerstown Borough	Yes	Yes	Yes	Yes	Yes	Yes	No
New Buffalo Borough	Yes	-	-	-	Yes	Yes	-
Newport Borough	Yes	-	-	-	Yes	Yes	-
Northeast Madison Township	-	-	-	-	No	Yes	-
Oliver Township	-	-	-	-	Yes	Yes	-
Penn Township	Eligible	Eligible	Eligible	Eligible	Yes	No	-
Rye Township	Eligible	Eligible	Eligible	Eligible	No	Yes	-
Saville Township	Yes	-	Yes	Yes	Yes	Yes	-
Southwest Madison Township	Eligible	No	Eligible	Eligible	No	Yes	No
Spring Township	Yes	No	Yes	-	No	Yes	-
Toboyne Township	Yes	Yes	Yes	No	No	Yes	-
Tuscarora Township	Eligible	Eligible	Yes	Eligible	Eligible	Eligible	Eligible
Tyrone Township	-	-	-	-	Yes	Yes	-
Watts Township	-	-	-	-	No	Yes	-
Wheatfield Township	Eligible	Yes	Yes	No	No	Yes	No

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

_____ YES NO

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MAR 11 2019
BY: JRF

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input type="checkbox"/>	Table 2	
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input type="checkbox"/>	Table 6	

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Michael C. Shaffer

Printed Name of Survey Respondent: MICHAEL C. SHAFFER

Telephone Number: 717-789-4377 Email Address: MICHAEL.SHAFFER73@YAHOO.COM

Municipality Represented: TYRONE TWP.

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input checked="" type="checkbox"/>	Table 1	Floodplain Ordinance - yes
<input checked="" type="checkbox"/>	Table 2	Emergency Operations Plan - YES
<input checked="" type="checkbox"/>	Table 3	Intergovernmental Cooperation - YES
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input checked="" type="checkbox"/>	Table 6	Act 537 Plan - yes

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Nancy Cangoli

Printed Name of Survey Respondent: Nancy Cangoli

Telephone Number: 717-834-4009 Email Address: wattstup@gmail.com

Municipality Represented: Watts

Legal and Regulatory Capabilities Mitigating Flood Hazards - Table 1

The following table identifies the legal and regulatory authority found in Perry County to deal with its principle hazard, flooding and is from the information contained in the 2014 MHMP.

Municipality	Floodplain Ordinance	National Flood Insurance Members	Stormwater Management Plan (Act 167)	Stormwater Management Ordinance
Perry County	-	Yes (Local)	No	No
Blain Borough	-	Yes (Local)	-	-
Bloomfield Borough	-	Yes (Local)	-	-
Buffalo Township	Yes (Local)	Yes (Local)	-	-
Carroll Township	-	Yes (Local)	-	-
Centre Township	-	Yes (Local)	-	-
Duncannon Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Greenwood Township	Yes (Local)	Yes (Local)	-	-
Howe Township	-	Yes (Local)	-	-
Jackson Township	-	Yes (Local)	-	-
Juniata Township	-	Yes (Local)	-	-
Landisburg Borough	Yes (State)	Yes (State)	-	Yes (State)
Liverpool Borough	Yes	Yes (Local)	-	Yes
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (Local)	-	Yes (Local)
Miller Township	-	Yes (Local)	-	-
Millerstown Borough	-	Yes (Local)	-	-
New Buffalo Borough	-	Yes (Local)	-	-
Newport Borough	-	Yes (Local)	-	-
Northeast Madison Township	-	Yes (Local)	-	-
Oliver Township	-	Yes (Local)	-	-
Penn Township	Yes (Local)	Yes (Local)	-	Yes (Local)
Rye Township	Yes	Yes (Local)	-	Yes
Saville Township	-	Yes (Local)	-	-
Southwest Madison Township	-	Yes (Local)	-	-
Spring Township	-	Yes (Local)	-	-
Toboyne Township	-	Yes (Local)	-	-
Tuscarora Township	-	Yes (Local)	-	-
Tyrone Township	-	Yes (Local)	-	-
Watts Township	YES-Local	Yes (Local)	-	-
Wheatfield Township	Yes (Local)	Yes (State)	-	Yes (Local)

Other Legal and Regulatory Capabilities to Deal with All Hazards - Table 2

The following table identifies the legal and regulatory authority found in Perry County to deal with all hazards from the information contained in the 2014 MHMP. Please determine whether the following information is correct and edit as where necessary.

Municipality	Capital Improvements Plan	Emergency Operations Plan	Post Disaster Recovery Plan	Post Disaster Recovery Ordinance
Perry County	No	Yes (County)	-	-
Blain Borough	-	Yes (County)	-	-
Bloomfield Borough	-	Yes (County)	-	-
Buffalo Township	-	Yes (County)	-	-
Carroll Township	-	Yes (County)	-	-
Centre Township	-	Yes (County)	-	-
Duncannon Borough	Yes (Local)	Yes (County)	-	-
Greenwood Township	-	Yes (County)	-	-
Howe Township	-	Yes (County)	-	-
Jackson Township	-	Yes (County)	-	-
Juniata Township	-	Yes (County)	-	-
Landisburg Borough	-	Yes (County)	-	-
Liverpool Borough	-	Yes (County)	-	-
Liverpool Township	-	Yes (Local)	-	-
Marysville Borough	Yes (Local)	Yes (County)	-	-
Miller Township	-	Yes (County)	-	-
Millerstown Borough	-	Yes (County)	-	-
New Buffalo Borough	-	Yes (County)	-	-
Newport Borough	-	Yes (County)	-	-
Northeast Madison Township	-	Yes (County)	-	-
Oliver Township	-	Yes (County)	-	-
Penn Township	-	Yes (County)	-	-
Rye Township	-	Yes (County)	-	-
Saville Township	-	Yes (County)	-	-
Southwest Madison Township	-	Yes (County)	-	-
Spring Township	-	Yes (County)	-	-
Toboyne Township	-	Yes (County)	-	-
Tuscarora Township	-	Yes (County)	-	-
Tyrone Township	-	Yes (County)	-	-
Watts Township	-	Yes (County) Local	-	-
Wheatfield Township	Yes (State)	Yes (County)	-	-

Administrative and Technical Capabilities – Table 3

Verify whether the following table correctly represents your municipality's administrative and technical capabilities from the information contained in the 2014 MHMP. If you see any edits please make the corrections and advise our office of the same.

Municipality	Planning Commission	Municipal Engineer	Personnel Skilled in GIS and/or HAZUS	Emergency Management Coordinator	Intergovernmental Cooperation
Perry County	Yes	Yes	Yes	Yes	Yes
Blain Borough	-	-	No	Yes	-
Bloomfield Borough	Yes	Yes	Yes (County)	Yes	-
Buffalo Township	Yes	Yes	No	Yes	-
Carroll Township	Yes	Yes	No	Yes	-
Centre Township	Yes	Yes	No	Yes	-
Duncannon Borough	Yes	Yes	Yes (County)	Yes	-
Greenwood Township	Yes	Yes	No	Yes	Yes
Howe Township	Yes	Yes	No	Yes	-
Jackson Township	-	-	No	Yes	-
Juniata Township	Yes	Yes	No	Yes	-
Landisburg Borough	-	-	Yes	Yes	County
Liverpool Borough	Yes	Yes	No	Yes	-
Liverpool Township	Yes	Yes	No	Yes	-
Marysville Borough	Yes	Yes	Yes (County)	Yes	Yes
Miller Township	Yes	Yes	No	Yes	-
Millerstown Borough	-	Yes	No	Yes	Yes
New Buffalo Borough	-	-	No	Yes	-
Newport Borough	Yes	Yes	Yes (County)	Yes	-
Northeast Madison Township	-	-	No	Yes	Yes
Oliver Township	Yes	Yes	No	Yes	-
Penn Township	Yes	Yes	No	Yes	-
Rye Township	Yes	Yes	No	Yes	-
Saville Township	Yes	Yes	No	Yes	-
Southwest Madison Township	-	-	Yes (County)	Yes	Yes
Spring Township	Yes	Yes	No	Yes	-
Toboyne Township	-	Yes	No	Yes	-
Tuscarora Township	Yes	Yes	No	Yes	Yes
Tyrone Township	Yes	Yes	No	Yes	-
Watts Township	Yes	Yes	No	Yes	YES
Wheatfield Township	Yes	Yes	Yes (County)	Yes	County

Planning Capabilities - Table 6

Confirm whether the following information from the 2017 Perry County Planning Commission's Annual Report is correct for your municipality, as the table will be included with this plan update. If you see any edits to this table, please advise us of the corrections.

Municipality	Planning Commission	Zoning Ordinance	Comprehensive Plan	S&LD Approving Body	Act 537 Plan	**UCC Regulation
Blain Borough	No	No	Yes (2015)	County	No	Perry COG/ BIU
Bloomfield Borough	Yes	Yes (1980)	Yes (1975)	Municipality	Yes	Perry COG/ BIU
Buffalo Township	Yes	No	Yes (1995)	Municipality	No	Perry COG/ BIU
Carroll Township	Yes	Yes (2003)	Yes (1987)	Municipality	Yes	Perry COG/ BIU
Centre Township	Yes	No	No	Municipality	Yes	Perry COG/ BIU
Duncannon Borough	Yes	Yes (1996)	Yes (1984)	Municipality	Yes	Glace Assoc., Inc.
Greenwood Township	Yes	Yes (1997)	Yes (2008)	Municipality	No	Perry COG/ BIU
Howe Township	Yes	Yes (1998)	Yes (1988)	Municipality	No	Perry COG/ BIU
Jackson Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Juniata Township	Yes	Yes (1993)	Yes (1993)	Municipality	Yes	Perry COG/ BIU
Landisburg Borough	No	No	No	County	No	Perry COG/ BIU
Liverpool Borough	Yes	Yes (1991)	Yes (1973)	Municipality	Yes	Perry COG/ BIU
Liverpool Township	Yes	Yes (2002)	Yes (2002)	Municipality	Yes	Perry COG/ BIU
Marysville Borough	Yes	Yes (1995)	Yes (2003)	Municipality	Yes	Perry COG/ BIU
Miller Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Millerstown Borough	No	Yes (1997)	Yes (2008)	County	No	Perry COG/ BIU
New Buffalo Borough	No	No	Yes (1996)	County	Yes	Perry COG/ BIU
Newport Borough	Yes	Yes (2000)	Yes (1995)	Municipality	No	Perry COG/ BIU
Northeast Madison Township	No	No	Yes (2003)	County	No	Perry COG/ BIU
Oliver Township	Yes	No	Yes (2015)	Municipality	Yes	Perry COG/ BIU
Penn Township	Yes	Yes (2003)	Yes (2006)	Municipality	Yes	Glace Assoc., Inc.
Rye Township	Yes	Yes (2011)	Yes (1999)	Municipality	Yes	Perry COG/ BIU
Saville Township	Yes	No	No	Municipality	No	Perry COG/ BIU
Southwest Madison Township	No	No	Yes (2003)	County	No	Perry COG/BIU
Spring Township	Yes	No	Yes (1991)	Municipality	No	Perry COG/ BIU
Toboyne Township	No	No	Yes (2015)	County	No	Perry COG/ BIU
Tuscarora Township	Yes	Yes (1992)	Yes (2008)	Municipality	Yes	Perry COG/ BIU
Tyrone Township	Yes	Yes (1996)	Yes (1995)	Municipality	Yes	Perry COG/BIU
Watts Township	Yes	Yes (2001)	Yes (1997)	Municipality	No YES	Perry COG/ BIU
Wheatfield Township	Yes	Yes (1993)	Yes (1974)	Municipality	No	"Opted Out"***

Source: Perry County Planning Commission/ TCRPC Staff

* County acts on all subdivisions but borough zoning regulations apply and override county lot sizes, areas and setbacks

** UCC—Uniform Construction Code

*** "Opted Out" - "If a municipality opts out, its... responsibilities under the UCC are to notify applicants for building permits that they must contract with certified third party agencies for residential permits and inspections or, if commercial construction is involved, secure permits and inspections from the Pennsylvania Department of Labor and Industry."

(Year) – Year of latest ordinance or plan

Perry County MHMP

Capabilities Evaluation Survey

1. Do you have any corrections to any of the accompanying capabilities evaluation tables?
(Please select either YES or NO)

YES NO

- If you answered YES, which tables do you wish to have edited?

Check the Box of the Table Needing to Be Edited	Table and Number	Brief Description of Issue with the Table
<input type="checkbox"/>	Table 1	
<input checked="" type="checkbox"/>	Table 2	Leave CAPITAL Improvement PLAN Blank.
<input type="checkbox"/>	Table 3	
<input type="checkbox"/>	Table 4	
<input type="checkbox"/>	Table 5	
<input checked="" type="checkbox"/>	Table 6	Comp PLAN-year-2013

***Please be sure to include all tables with your edits when you respond to this survey.

- If you selected NO, simply fill out the contact information below and return this page to our office.

Please provide your contact information below. Thank you for your time and participation.

Applicant Signature: Barry L Schrage

Printed Name of Survey Respondent: Barry Schrage

Telephone Number: 717-834-5467 Email Address: wheatfld@ptd.net

Municipality Represented: Wheatfield Township

CHAPTER 6

MITIGATION STRATEGY

Update Process Summary

This plan was prepared by focusing efforts toward soliciting projects and restructuring the plan to meet PEMA’s skeleton guidelines for HMP format.

Project solicitation is a process which truthfully never ends. Municipal officials are all aware they may submit the new structural and non-structural projects for inclusion at any point in the year. This chapter reveals the collection of this information.

A HAZUS-MH loss estimate analysis and a flood exposure analysis on the parcels within Perry County were performed as part of this hazard mitigation plan update to inform the planning stakeholders and county residents regarding the potential economic impacts that a 100-year flood may have on Perry County. The results of these analyses are discussed in Chapter 4: Risk Assessment under the Economic Vulnerability Assessment as well as Appendix D: Local Municipality Flood Vulnerability Maps.

Mitigation Goals and Objectives

Requirement §201.6(c)(3)(i): The hazard mitigation plan is required to include, “a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.”¹

In 2008 with the initial HMP, the goals were developed following the Hazard Vulnerability Analysis and Risk Assessment together with the input received from the County and its 30 municipalities. The extensive public involvement process has continued with this plan update and has helped to reevaluate and refine the goals. The following goal declarations identify long-term objectives intended to reduce or avoid vulnerabilities to flooding and the other natural, human-made hazards described in this plan.

The Goals and Objectives are as follow:

- **Goal 1:** Strengthen County and municipal capabilities

Objective: To reduce potential impacts of flooding on existing and future public/ private assets, including structures, critical facilities, and infrastructure.

- **Goal 2:** Increase intergovernmental cooperation and build public/ private partnerships

Objective: To implement activities that will reduce the impact of natural, manmade, and technological hazards.

- **Goal 3:** Enhance planning and emergency response efforts among state, county, and local emergency management personnel

Objective: To protect public health and safety.

- **Goal 4:** Continue to build Perry County’s spatial information resources

Objective: To strengthen public and private hazard mitigation planning and decision-support capabilities.

- **Goal 5:** Increase public awareness on both the potential impacts of natural hazards and activities

Objective: To reduce the impacts from such hazards.

- **Goal 6:** Align with the Commonwealth’s framework for hazard mitigation planning.

Objective: To maintain relative uniformity between plans.

- **Goal 7** Protect the health, safety and general welfare of individuals within the County, their property (including repetitive loss and severely repetitive loss properties), their environment with the quality of life it provides and the abundance of natural resources.

Objective: Maintain the County Multi-Hazard Mitigation Plan

Hazard Mitigation Strategies and Implementation

Requirement §201.6(c)(3): “The plan shall include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.”¹

To address this requirement, the comprehensive mitigation strategy for Perry County its 30 municipalities include mitigation actions that fit into the following six categories: emergency service, natural resource protection, preparedness, property protection, public information, and structural projects.

1. *Emergency service* measures targeting preparedness opportunities for the Perry County Emergency Management Agency, EOC Staff, County Geographic Information System (GIS) staff, Local Emergency Planning Committee (LEPC), the Planning Commission staff, and local emergency management coordinators. Such measures include:
 - Communications and warning
 - Emergency operations planning
 - Continuity of government planning (using guidelines established in NFPA 1600)
 - Evacuation route planning
 - Critical facilities protection
 - Public health and safety monitoring
 - Standardized street addressing
 - Hazardous materials planning
 - Damage assessment and reporting
 - Hazards U.S. (HAZUS) training
 - Special needs population identification

2. *Natural resource protection* measures which help preserve the County’s floodways (regulatory and fringes) and protect public and private property through:
 - Floodplain and riparian areas protection
 - Stormwater management
 - Erosion and sediment control
 - Wetlands protection
3. *Preparedness* measures strengthen county- and municipal-level planning and administration activities for all-hazard events through
 - Post-disaster recovery and reconstruction; Trainings and drills; and Intergovernmental cooperation
4. *Property protection* measures identify and protect both public and privately owned property assets and critical infrastructure. These measures include repetitive-loss properties and identifying opportunities to permanently remove people, property, and businesses from the County’s flood-prone areas. Property protection mitigation measures include:
 - Identifying repetitive loss structures
 - Flood insurance
 - Business continuity planning
 - Floodplain regulations
 - Critical infrastructure protection
 - Acquisition
 - Elevation for residential structures and
 - Wet and dry flood-proofing for non-residential structures
5. *Public information* measures are intended to advise officials and the public of hazards and ways to protect people and property from them. Methods for disseminating public information include:
 - Flood maps and data
 - Print media
 - Websites
 - Public advisory and outreach programs
 - Flood warning and responses
 - Technical and financial assistance
6. *Structural projects* are capital improvement opportunities to mitigate the effects of flood risks and power outages from severe storms on local critical infrastructure. Some examples include:
 - Bridge improvements
 - Channel modifications
 - Critical facility relocation
 - Stormwater detention or retention projects,
 - Evacuation route improvements
 - Enhancing communications
 - Evaluating existing power supply

Identification and Analysis of Mitigation Techniques

Requirement §201.6(c)(3)(ii): “The mitigation strategy shall include “a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.”¹

The Hazard Vulnerability Analysis housed in Chapter 4 of the Perry County MHMP evaluated the County’s risks and vulnerability to the plan-identified human introduced and technological hazards. The analysis determined that Perry County and the 30 municipalities still remain most vulnerable to natural hazards, particularly flooding, severe weather (particularly winter storms), and even radon. From the technological side transportation hazards remains a popular choice with utilities failure drawing additional attention.

TABLE 6.1

GOALS, OBJECTIVES AND ACTION PLAN STRATEGIES SUMMARY

Goal 1: Strengthen County and municipal capabilities.		
1.1	Objective: To reduce potential impacts of flooding on existing and future public/ private assets, including structures, critical facilities, and infrastructure.	
	Strategy 1: Evaluate and refine the County's repetitive loss structures list by ranking properties based on the number of losses and the value of the claims paid and target the priority properties for buyout opportunities	Non-structural project
	Strategy 2: Continue to encourage the County's National Flood Program communities to participate in the NFIP Community Rating System (CRS) to attain discount opportunities on flood insurance premiums	Non-structural project
	Strategy 3: Obtain first floor flood elevation data for the county's inventoried critical infrastructure and intersect this information with the base flood elevations to identify high risk facilities and formulate mitigation strategies	Non-structural project
	Strategy 4: Incorporate the County's Flood Warning and Response System (FWRS) Procedures into Emergency Support Function 2 (Communications and Warning) of the County's Regional EOP	Non-structural project
	Strategy 5: Encourage municipal officials to prepare and enact stormwater management ordinances consistent with Act 167 Stormwater Management Plans	Non-structural project
	Strategy 6: Conduct outreach to municipalities to	Non-structural project

	ensure continued compliance with NFIP	
	Strategy 7: Collect and analyze data on the specific locations and damages caused by flooding in each of the municipalities in Perry County to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 8: Maintain a list of repetitive loss structures from the Governor's Center for Local Government Service's NFIP Coordinator and incorporate the data into the County's Hazard Mitigation Planning project	Non-structural project
	Strategy 9: Continue to ensure County and municipal subdivision and land development ordinances are consistent with Chapter 102 Erosion & Sedimentation Control requirements	Non-structural project
	Strategy 10: Continue to maintain the countywide greenway plan as an integrated part of the County Comprehensive Plan to manage development and its encroachment on floodplains, and impact on riparian buffers and stream corridors	Non-structural project
Goal 2: Increase intergovernmental cooperation and build public/ private partnerships.		
2.1	Objective: To implement activities that will reduce the impact of natural, manmade, and technological hazards.	
	Strategy 1: Consider implementing a circuit-rider program to staff and fund a full-time county engineer that would be shared by both the county and participating municipalities to provide technical reviews of municipal subdivision and land development plans, conduct bridge inspections, and perform routine and emergent municipal engineering inspections/reviews	Non-structural project
	Strategy 2: Continue to work with municipalities to identify and incorporate hazard mitigation project opportunity forms to include in the 5 year update of the HMP.	Non-structural project
	Strategy 3: Continue to solicit input from municipalities and public and private stakeholders, including local schools and colleges, the Chamber of Commerce, and other groups, for the Hazard Mitigation Plan update	Non-structural project
	Strategy 4. Expand the utilization of the PennFIRS fire reporting system and include this data into the 5 year update of the HMP.	Non-structural project
	Strategy 5: Conduct analysis on the future demand for expanded infrastructure and critical facilities in Perry County	Non-structural project
Goal 3: Enhance planning and emergency response efforts among state, county, and local		

emergency management personnel.		
3.1	Objective: To protect public health and safety.	
	Strategy 1: Continue to maintain the County's Standardized Street Addressing to support accurate and timely emergency response	Non-structural project
	Strategy 2: Update the Perry County EOP to be consistent with the National Response Plan	Non-structural project
	Strategy 3: Continue to work with the Pennsylvania Department of Health and the Pennsylvania Emergency Management Agency to implement a Strategic National Stockpile Plan for Perry County and the South Central Task Force (SCTF)	Non-structural project
	Strategy 4: Prepare a countywide Emergency Communications Procedures Manual (ECPM) to establish a consolidated and uniform set of communications policies and procedures for Perry County's fire, EMS, and police services	Non-structural project
	Strategy 5: Ensure the Continuity of Government Plans for all Perry County Government offices are maintained and kept current.	Non-structural project
	Strategy 6: Create and maintain a web-based inventory of the County's special needs population to strengthen emergency response and evacuation operations	Non-structural project
	Strategy 7: Consider adopting a county-wide post-disaster recovery and reconstruction ordinance using the model ordinance included in the APA/FEMA PAS Report No. 483/484	Non-structural project
	Strategy 8: Continue to work with the County's agricultural community to develop and implement the County Animal Response Team (CART) to strengthen the County's comprehensive emergency management program	Non-structural project
	Strategy 9: Develop a disaster debris management plan	Non-structural project
Goal 4: Continue to build Perry County's spatial information resources.		
4.1	Objective: To strengthen public and private hazard mitigation planning and decision-support capabilities.	
	Strategy 1: Implement a countywide electronic damage assessment management tool to increase the efficiency of county and municipal damage survey and reporting	Non-structural project
	Strategy 2: Maintain a thorough critical facilities vulnerability assessment and impact analysis using the HMP's GIS-based critical infrastructure inventory	Non-structural project

	Strategy 3: Maintain a GIS dataset of the locations of the SARA facilities in Perry County to analyze their vulnerability to potential hazards	Non-structural project
	Strategy 4: Maintain a GIS dataset of the locations of the critical facilities in Perry County to analyze their vulnerability to potential hazards	Non-structural project
	Strategy 5: Maintain a GIS dataset of all municipal Traffic Control Points (TCP) and Access Control Points (ACP) for evacuation route planning	Non-structural project
	Strategy 6: Ensure all County GIS staff receive regular HAZUS training from EMI	Non-structural project
Goal 5: Increase public awareness on both the potential impacts of natural hazards and activities.		
5.1	Objective: To reduce those impacts.	
	Strategy 1: Continue to integrate the 5-year maintenance cycle of the Hazard Mitigation Plan with both the 10-year and biennial review and maintenance cycles of the County Comprehensive Plan and County Regional Emergency Operations Plan, respectively (see Plan Maintenance Process Section of the HMP)	Non-structural project
	Strategy 2: Maintain a countywide capital improvements plan to program, schedule, prioritize, and budget both county and municipal capital improvements	Non-structural project
	Strategy 3: Work with the Chambers of Commerce to encourage all business owners to prepare and implement a Business Continuity Plan to provide safeguards against business activity interruptions	Non-structural project
	Strategy 4: Strengthen the County's domestic animal health surveillance by familiarizing the Perry County agricultural community with the list of reportable diseases and conditions related to animal health per the Office of International Epizootics (OIE) and the Pennsylvania Domestic Animal Act (Act 100 of 1996)	Non-structural project
	Strategy 5: Collect and analyze data on the specific impacts severe winter weather has on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 6: Collect and analyze data on the specific impacts droughts have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 7: Collect and analyze data on the specific impacts transportation accidents have on Perry	Non-structural project

	County and its municipalities and identify areas in need of safety improvements to include in the 5-year update of the Hazard Mitigation Plan	
	Strategy 8: Collaborate with the DEP Bureau of Radiation Protection to ensure the State's Radon Awareness Campaign and public service announcements are disseminated throughout Perry County	Non-structural project
	Strategy 9: Collect and analyze data on the specific impacts severe temperatures have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 10: Collect and analyze data on the specific impacts dam failures have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 11: Collect and analyze data on the utility providers in Perry County and the specific impacts power failures have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 12: Collect and analyze data on public health emergencies and what specific impacts an outbreak or pandemic would have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 13: Collect and analyze data on the specific impacts an infestation of forest insects and disease would have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 14: Support efforts to maintain the TCRPC's Goods Movement Study to ensure the County planning department, first responders, and local officials understand the types, frequencies, and amounts of hazardous materials being transported through its borders	Non-structural project
	Strategy 15: Collect and analyze data on the specific impacts earthquakes have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 16: Collect and analyze data on the specific impacts hurricanes and tropical storms have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 17: Collect and analyze data on the specific	Non-structural project

	impacts tornados have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	
	Strategy 18: Collect and analyze data on the specific impacts wildfires have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 19: Collect and analyze data on the specific impacts sinkholes have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 20: Collect and analyze data on the specific impacts landslides have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 21: Collect and analyze data on the specific impacts urban fires and wildfires have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 22: Identify potential terrorism targets, collect and analyze data on the specific impacts potential terrorism tasks, and include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 23: Collect and analyze data on the specific impacts a nuclear power plant disaster would have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 24: Collect and analyze data on the specific impacts subsidence events would have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 25: Identify areas where civil disorder may occur and collect and analyze data on the specific impacts acts of civil disorder may have on Perry County and its municipalities to include in the 5-year update of the Hazard Mitigation Plan	Non-structural project
	Strategy 26: Maintain and disseminate a list of DEP-certified radon testers, mitigates and laboratories (current lists are available through DEP at http://www.dep.state.pa.us/dep/deputate/airwaste/rp/Radon_Division/Radon_Homepage.htm)	Non-structural project
Goal 6: Align with the Commonwealth’s framework for hazard mitigation planning.		
6.1	Objective: When possible, mirror the format for the State Hazard Mitigation Plan	
	Strategy 27: Continue to prepare MHMP updates in lock-step with the Commonwealth’s HMP time sequence (1 yr. behind) so more in known about the	Non-structural project

	resulting state plan.	
Goal 7: Protect the health, safety and general welfare of individuals within the County, their property (including repetitive loss and severely repetitive loss properties), their environment with the quality of life it provides and the abundance of natural resources.		
7.1	Objective: Maintain the County Multi-Hazard Mitigation Plan	
	Strategy 28: Reduce reliance on the availability of Federal or state funding to prepare the MHMP by increasing funding to the Perry County Planning Program for the preparation of future MHMPs.	Non-structural project

In Chapter 6, TABLES 6.1 and 6.2 identify a comprehensive range of specific mitigation actions including structural projects to reduce the impacts of flooding and other natural, manmade, and technological hazards. Appendix F contains copies of all MHMP Project Opportunity Forms submitted to the County during this update cycle. Many of these projects were structural in scope, and are identified in both previously referenced tables.

TABLE 6.1 in Chapter 6 presents a series of non-structural mitigation measures as well as potential timeframes for their implementation, potential funding source(s), responsible entities, and estimated costs when available.

TABLE 6.2 in Chapter 6 presents a series of structural projects collected from Perry County and its 30 municipalities.

Mitigation Action Plan

Requirement §201.6(c)(3)(iii): The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.¹

The non-structural projects located in Appendix E, Table E.1 are grouped according to the aforementioned categories and by applicable hazard vulnerability. The measures were also given a priority score based on their potential impact and benefit. This method of prioritizing projects examined each project’s impact and benefit relative to cost (when available), segment of the population affected (countywide vs. local), and long-term benefit to the population served. Carryover projects retained their prior calculated values from the 2008 HMP.

The structural projects located in Chapter 6 Table 6.2 have been thoroughly evaluated and prioritized, and will be implemented and administered according to the specified implementation strategy. The scoring of the structural projects is available in the table under the Community Rank heading. As with non-structural carry over projects, structural carry over projects retained their calculated values from the previous plan.

¹ Ibid.

Steering Committee members prioritized the structural projects by evaluating each new project against the seven criteria. First each project was scored based on the following three questions. (Yes responses were awarded one point)

Will the project mitigate one of the County’s top three hazards?

Will the project provide a multi-municipal benefit?

Will the project address a recurring problem?

During the next sequential step, each project was evaluated on how well it protects the population, critical facilities, the economy, and the environment. Values ranging from 1-3 (1 representing a low score, 2 representing a medium score, and 3 representing a high score) were first assigned to four different areas, based on the protection of the population, critical facilities, the economy, and the environment. These numbers were then weighted by significance. For instance, population protection was scored as being more significant than protection of the environment. Therefore population protection is weighted at 40 percent while environmental protection is weighted at 10 percent.

The example below illustrates how a projects ranking could be calculated.

$$\text{Project Score} = (\text{Top Three Hazard?}) + (\text{Multi-Municipal Benefit?}) + (\text{Recurring Problem?}) + [(.40 \times \text{Population}) + (.25 \times \text{Critical Facilities}) + (.25 \times \text{Economy}) + (.10 \times \text{Environment})]$$

An example of how a project could be scored can be seen below:

$$(1) + (1) + (1) + [(.40 \times 3) + (.25 \times 3) + (.25 \times 3) + (.10 \times 1)] = 5.80$$

A thorough cost/benefit analysis will be conducted prior to seeking hazard mitigation funding for projects to be completed. Such funding for HMP projects continues to be competitive. Moreover, assistance goes to projects found to be technically feasible in the pursuit of such actions.

TABLE 6.2
FINAL RANKING OF STRUCTURAL PROJECTS

Project ID	Applicant	Project Name	Mitigation Measures		Benefit and Prioritization		
			Project Description	Mitigation Objective	Impact (Figure represents the average of all responses received; range 1-5)	Benefit (Figure represents the average of all responses received; range 1-5)	Impact x Benefit Score
19-01-SMM* (Former 13-01)	Newport Borough	Newport Storm Sewer Separation	At present, the Newport Borough storm water system consists of three components: (1) open channel sewers, (2) underground storm mains with street level inlet systems, (3) combined storm/sanitary underground sewer system. All three systems are in dire need of rehabilitation. Open channels need reformed and widened, inlet boxes and grating need replaced, and underground sewer needs rehabilitated.	Localized flooding during high rainfall events. Many locations through the Borough experience localized flooding resulting from collapsed piping, plugged inlets and broken pipes. Property damage and costly repairs to street infrastructure results.	4	5	20
19-02-SMM	Newport Borough	Newport Floodplain Buyout Program	Acquire and demo repetitive loss floodplain properties	Eliminating long-term flooding of properties in the floodplain	5	4	20
19-03-SMM	Perry County EMA	Duncannon Subway	Duncannon Subway	Eliminate flooding of the Duncannon Subway and closure of SR 0849	4	4.67	18.67
19-04-SMM	Newport Borough	Newport Backup Generator Acquisitions	Obtain generators for critical municipal facilities	Maintain essential operation of services within the Borough	3.67	4.67	17.33
19-05-SMM	Wheatfield Township	Linton Hill Rock Slides	Linton Hill Rock Slides	Prevent additional rock from falling onto Linton Hill Road	4	4.33	17.33
19-06-SMM	Rye Township	Lambs Gap Road Mudslides	Lambs Gap Road Mudslides	Prevent additional mud from spreading onto Lambs Gap Road	3.67	4	15
19-07-SMM	Marysville Borough	Marysville Sewer Plant Protection	Sewer plant essential operations equipment flood protection	Flood proof exposed equipment around the sewer plant	6.33	4	14.67
19-08-SMM	Jackson Township	Lawler (941 Back Hollow Road) Floodplain Buyout	Property buyout, dwelling removal and outbuilding relocation	Purchase property, remove the dwelling and allow the property owners to contribute to the relocation of the outbuildings	3.67	3.67	14.33
19-09-SMM	Newport Borough	Newport Railroad Protections	Construct barrier along railroad tracts to mitigate damage from railway accident and abate sound	Protection from derailment and the potential for hazardous materials release	3.33	4	13.67
19-10-SMM	Wheatfield Township	Wheatfield Portable Radio Communications Improvements	Emergency services radio/portable radio coverage	Improve communications for emergency responders	3.67	3.67	13.67
19-11-SMM* (Former 13-03)	Blain Borough Council	Blain Stream Clearance	Stream Clearance	Eliminate repetitive flooding	3	3.67	12.33
19-12-SMM	Newport Borough	Newport Mitigated Construction	Construct and mitigate structures in the floodplain	Attending to structural compliance with respect to the floodplain levels	3	4	12
19-13-SMM	Newport Borough	Buffalo Creek Flood Control	Erect Buffalo Creek flood control structure	Reduce flooding potential along Buffalo Creek	3.33	3.33	12
19-14-SMM	Newport Borough	Newport Subway Closure	Permanently close subway	Eliminate river water from backing up into the Borough	2.67	3.33	9.33

19-15-SMM	Newport Borough	NBWA Waterline Relocation	Relocate Newport Borough Water Authority waterline running along the Juniata River bridge (bury under river)	Eliminates the potential for debris damage to this community infrastructure during a flooding event	3	3.33	9.67
19-16-SMM	Newport Borough	Newport CRS Survey	Conduct Community Rating System (CRS) survey	Improve the rating as part of the CRS program	2.67	3	8
19-17-SMM**	Marysville Borough	Little Meadow Estates Flood Protection	Erect unnamed tributary to Fishing Creek flood control structure	Reduce flooding potential along unnamed tributary to Fishing Creek	Not Applicable	Not Applicable	Not Applicable

* From the last HMP

** Late Project Opportunity Submission

CHAPTER 7
PLAN MAINTENANCE

Update Process Summary

MHMP Integration into existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.¹

Implementation with Consideration Afforded to Existing Programs

This plan update recognizes there are many other efforts that are actively attending to the prevention of hazards in and around Perry County. This includes the current hazard mitigation plans of each surrounding county. The same can be said for all county and municipal comprehensive plans especially through land use planning. From the natural hazard perspective, this plan heightens the importance of assuring the county comprehensive plan always guides county and municipal efforts in a way to redirect development away from high risk natural hazard areas.

Presently the Tri-County Regional Planning Commission's newsletter goes out to 1,832 subscribers. Case studies of successful efforts to protect hazard prone areas far too often go unheralded.

The TCRPC has also adopted two model ordinances for municipal use and assistance in developing provisions to protect sites from natural and manmade hazards. Aside from identifying these efforts integration needs to be constantly monitored.

This plan accepts the guidance of all previously established documents to the extent they are legally compliant in their efforts. It also leaves room for additional thoughts and advice from all emergency service professionals through their emergency service plans and initiatives.

On these same lines, it is as important for the county's municipalities continue to advance themselves by integrating hazard mitigation into the comprehensive plan development process or capital improvements programming. Moreover, actions like updating local regulations can assist with hazard avoidance or prevention. With adjustments to such regulations, comes a need for training considerations for ordinance administrators.

In the case of comprehensive planning, municipalities can adopt the county comprehensive plan for their use. To further encourage such consideration the county could look to develop its plan in a way to sub-regionally package the plan for its municipalities.

Surrounding County Hazard Mitigation Plans

Method

Each of the surrounding county hazard mitigation plans has been prepared to meet the base standards for document delivery as set by FEMA. This covers text content with an emphasis placed on public participation. In Perry County the process involves the investment of a significant amount of staff time, committed volunteers, agency cooperation, and the availability of external funding.

Maintenance Schedule

¹ Ibid

The 5-year update cycle is difficult for Perry County and other adjoining counties to stay current with updates. For counties with larger planning budgets and staffing these updates have been comparably easy to accomplish. Exiting year three of the plan, PDM grant applications should be submitted to FEMA.

The Perry County Comprehensive Plan

Method

The Perry County Planning Commission (PCPC) is responsible for maintaining and updating the County Comprehensive Plan and the County Subdivision and Land Development Ordinance. On a monthly basis the Commission meets to discuss, and comment on planning related issues and review subdivision and land development plans. It uses this information to identify necessary revisions and to amend both the Comprehensive Plan and the Subdivision and Land Development Ordinance. The PCPC's meetings are open to the public and are advertised annually in accordance with the Pennsylvania Sunshine Act (65 PA C.S.A.). Of the 30 municipalities in Perry County, 21 have local comprehensive plans (See Chapter 17: Capabilities Assessment).

Technical assistance on community planning matters is provided to the PCPC and the County Board of Commissioners through the Perry County Planning Commission. The Planning Department administers the County Comprehensive Plan, along with the County Subdivision and Land Development Ordinance. The Planning Commission also performs technical reviews of municipal subdivision and land development plans, municipal floodplain ordinances, municipal stormwater management plans and ordinances, and other community planning and development matters.

Maintenance Schedule

From Article III of the Pennsylvania Municipalities Planning Code (Act 247 of 1968, as reenacted and amended) Perry County is required to adopt a comprehensive plan and update it at least every 10 years. The Disaster Mitigation Act of 2000 (DMA) requires a five-year update cycle for HMPs. By merging these requirements when possible, it will allow the County to improve integration of these planning processes and strengthen public participation in both efforts.

The current Perry County Comprehensive Plan was adopted on February 26, 2007. As written the plan provides general direction and conceptual design for the future of Perry County and all of its municipalities. As required by the Municipalities Planning Code, the Comprehensive Plan will need to be updated in 2017. At that time, recommendations from the MHMP can be incorporated into the document. In following, municipal plans should also integrate relevant changes from the MHMP.

Future plan update efforts will attempt to seek partnerships with municipalities to work with the county to develop a plan and future updates that will ultimately fill all local needs in this regard.

Tri-County Regional Planning Commission's (TCRPC) newsletter

The educational value it provides local citizens on planning related subject matter is unequalled in the PA Capital Region. Presently the distribution numbers reveal persons. What better way to continually inform the public and public servants of hazard prevention and mitigation efforts.

Method

As a continued effort to keep municipal officials and the public informed of planning activities in the region the TCRPC has continued to maintain a newsletter since 1970.

Maintenance Schedule

The TCRPC’s newsletter is a tri-annual document usually distributed in April, August, and December. Contributors are not always staff members, and can occasionally be outside entities.

TCRPC Model Ordinances

Method

At the center of many of the TCRPC’s effort is the one to develop maintain advanced model zoning, subdivision and land development and other prescriptive ordinances. The pursuit to develop well-structured and uniform ordinance language for use at all levels of government is important for the public to gain an understanding of how the protections work to their benefit by protecting them. From the public service side, uniform ordinance wording can lead to uniform translation and understanding of the requirements.

Maintenance Schedule

As needed, updates should consider advancements in the planning field, legal standing. This method may also account for newly identified hazards the way the ordinance models have been structured to account for natural hazards.

Perry County Emergency Operations Plan

Method

The Pennsylvania Emergency Management Services Code, 35 PA C.S. Sections 7701-7707, as amended, requires emergency operations plans (EOPs) to be prepared for each county and municipality. The Code further prescribes these plans be maintained and kept current. The Perry County Emergency Management Agency (EMA) is responsible for preparing and maintaining the County’s EOP. The EOP covers both the County and municipal emergency management operations and procedures.

At a minimum the EOP is required to be reviewed biennially. A review of the plan is performed whenever portions of the plan are implemented or an emergency event or training exercise; changes are made where necessary. The resulting changes are in turn distributed to the County’s local emergency management coordinators for their use and reference.

Maintenance Schedule

An annual review of the MHMP will be undertaken by the Steering Committee to keep an annual record of accomplishments during the year. Table 7.1 below identifies the four annual meetings that were held.

The Perry County Emergency Management Agency should reconsider the County’s MHMP during its biennial review of the County EOP. Recommended changes to the MHMP could then be coordinated with the Hazard Mitigation Planning Steering Committee.

Monitoring, Evaluating and Updating the Plan

Every year the Steering Committee reunites to evaluate the plan, projects completed and any new projects received.

**TABLE 7.1
ANNUAL HMP REVIEW HISTORY**

Interim Review Period	Meeting Location	Date	Documentation
Year 1 (2015)	Perry County Commissioners Conference Room, Veterans Memorial Building, New Bloomfield, PA	June 17, 2015	Included in Appendix G
Year 2 (2016)	Perry County Commissioners Conference Room, Veterans Memorial Building, New Bloomfield, PA	June 15, 2016	Included in Appendix G
Year 3 (2017)	Perry County Commissioners Conference Room, Veterans Memorial Building, New Bloomfield, PA	June 21, 2017	Included in Appendix G
Year 4 (2018)	Perry County Commissioners Conference Room, Veterans Memorial Building, New Bloomfield, PA	June 20, 2018	Included in Appendix G

Time permitting, as part of the annual review process the following progress report form must be prepared to document an evaluation of each structural project.

Worksheet #1: Hazard Mitigation Progress Report - (For completed sheets see Appendix H)

**Hazard Mitigation Project Progress Report
(For Structural Projects)**

Progress Report Period: _____ to _____

Project Title: _____ Project Identification Number: _____

Responsible Municipality: _____

Address: _____

Municipal Contact Person: _____

Telephone Number: _____

Total Estimated Project Cost: \$ _____

Anticipated Cost Over budget \$ _____ Under budget: \$ _____

Date of Project Approval: _____ Project Start Date: _____

Project Description (Include in phases if applicable)

Milestones	Completion %	Anticipated Completion Date

Plan Goals(s)/ Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of success (e.g., losses avoided as a result of the acquisition program): In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.)

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 – to complete a project evaluation):

Project Status

Project Cost Status

- (1) Project on schedule
- (2) Project completed

- (1) Cost unchanged
- (2) Cost Over Budget*
*Please explain: _____

- (3) Project delayed*
*Please explain: _____

- (3) Cost under budget*
*Please explain: _____

- (4) Project canceled

Summary of progress on the project for this report

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next steps: What is/ are the next step(s) to be accomplished over the next reporting period?

Other comments:

Worksheet #2: Evaluating the Planning Team

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

- 1. Have there been any local staffing changes that would warrant inviting different members to the planning team?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

- 2. Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

- 3. Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

- 4. Are there procedures (e.g., signing of MOAs, commenting on submitted progress report forms, distributing meeting minutes, etc.) that can be done efficiently?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

- 5. Are there ways to gain more diverse and widespread cooperation?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

Are there procedures that can be done efficiently? (e.g., signing of MOAs, commenting on submitted progress report forms, distributing meeting minutes, etc.)

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

- 6. Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?

__ YES	<u>X</u> NO
--------	-------------

Comments/ proposed action: _____

If the planning team determines the answer to any of these questions is "YES," some changes may be necessary.

Worksheet #3: Evaluation of Project Results - (For completed sheets see Appendix H)

Project Name: _____ Project Number: _____

Project Budget: _____

Project Description:

Associated Goal and Objective(s):

Indicator of success (e.g., losses avoided):

Was the action implemented?

If "YES," what were the results of the implemented action?

If "NO," why not?

	Was there political support?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were there enough funds available?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were workloads equitable or realistically distributed?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was new information discovered about the risks or community that made implementation difficult or no longer sensible?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was the estimated time of implementation reasonable?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were sufficient resources (for example staff and technical assistance)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

1. Were the outcomes expected?

2. If "NO," please explain: _____

3. Did the results achieve the goal and objective (s)? YES NO

4. Was the action cost effective? YES NO

Explain how or why not: _____

5. What losses were avoided after completion of the project? _____

If it was a structural project, how did it change the hazard profile? _____

Prepared by: _____ Date: _____

Worksheet #4: Revisiting the Risk Assessment

Risk Assessment Steps	Questions	Not	YES	NO	Comments
Identify hazards	Are there new hazards that can affect your community?		X		Illegal Drug Activity
Profile hazard events	Are there new historical records available?		X		Emergency Declarations – Flooding
	Are additional maps or new hazard studies available			X	Many including a Composite Hazard Map and Multi-Hazard Risk Map
	Have chances of future events (along with their magnitude, extent, etc.) changed?			X	
	Has recent and future development in the community been checked for their effect on hazard areas?		X		Minimal development during 5-Yr. planning cycle
Inventory assets (Critical facilities)	Have inventories of existing structures in hazard areas been updated?	X			No additions noted
	Are future developments foreseen and are they accounted for in the inventories?	X			No additions noted
	Are there any new special high-risk populations?			X	
Estimate losses	Have loss estimates been updated to account for recent changes?		X		Incorporated the state’s model estimates

Worksheet #5: Revise the Plan

When preparing to update the Plan

- | | |
|--|-----------------------------------|
| <p>1. Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>2. Reconvene the planning team, making changes to the team composition as necessary (see results from Worksheet #2)</p> | <p><input type="checkbox"/> X</p> |
| <p>3. Comments: <u>None</u></p> | |
| <p>4. Consider the results of the evaluation and new strategies for the future. When examining the community should consider:</p> | |
| <p>a. The results of the planning and outreach efforts.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>b. The results of mitigation efforts.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>c. Areas affected by recent disasters.
 Comments: <u>Duncannon Borough, Liverpool Borough, Marysville Borough, and Carroll Township</u></p> | <p><input type="checkbox"/> X</p> |
| <p>d. The recent magnitude, location and type of the most recent hazard or disaster.
 Comments: <u>Hurricane Irene and Tropical Storm Lee</u></p> | <p><input type="checkbox"/> X</p> |
| <p>e. New studies or technologies.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>f. Changes in local, state or federal laws, policies, plans, priorities, or funding.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>g. Changes in the socioeconomic fabric of the community.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |
| <p>h. Other changing conditions.
 Comments: <u>None</u></p> | <p><input type="checkbox"/> X</p> |

Incorporate your findings into the plan

When examining the plan:

1. Revisit the risk assessment. X
 Comments: **The Risk Assessment provided on pages 27-33 is still valid with the addition of illegal drug activity.**

2. Update your goals and strategies. X
 Comments: **The plan reflects the steering committee’s decision to slightly revise the goals, objectives and strategies.**

3. Recalculate benefit-cost analyses of projects to prioritize action items. X
 Comments: **The plan’s benefit-cost analyses will need to be conducted on the one floodplain mitigation project in Jackson Township.**

Use the following criteria to evaluate the plan:

Criteria	YES	NO	Solution
Are the goals still applicable?	X		The plan as structured reflects goals offered up from the Commonwealth’s HMP
Have any changes in the state or community made the goals obsolete or irrelevant?		X	
Do existing actions need to be reprioritized for implementation?	X		Completed projects were removed. New projects were evaluated by the Steering Committee and their resulting averages enable each project to be inserted for their official ranking.
Do the plan’s priorities correspond to the state priorities?	X		
Can actions be implemented with available resources?		X	Those submitting projects will need to apply funding to offset these anticipated expenses

Continued Public Involvement

Requirement §201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.²

The Perry County Emergency Management office will ensure that the MHMP is posted and maintained on the Perry County website. The page will continue to encourage public review and comment on the plan. Hyperlinks will also be provided from the Perry County Planning Commission and the Perry County EMA webpages. All municipalities with websites will be encouraged to also provide hyperlinks to the webpage housing the plan.

Perry County citizens are always encouraged to submit their comments to elected officials and/or members of the MHMP Steering Committee. To promote additional public participation, Perry County welcomed comments on the MHMP for a 45-day period considering the requirements of the PA MPC. This open public comment period was offered to afford the public the opportunity to supply their comments on the MHMP. All comments received during the process were considered by the steering Committee for the purpose of updating the MHMP.

Perry County officials will continue to maintain an open policy between plan updates by accepting project opportunities when presented with the completed form. On an annual basis as a reminder of this policy, the municipal governing body will be notified of the opportunity to submit projects for inclusion into future plan updates. Furthermore the County will continue to reach out to municipalities regarding mitigation projects, especially those municipalities that did not submit projects for inclusion in this MHMP. Any additional MHMP project opportunity forms received during the life-cycle of this 5-year MHMP will be incorporated into the plan as an interim update and included in the next 5-year update of the plan.

The Multi-Hazard Mitigation Plan is available online for review at: <https://www.tcrpc-pa.org/perr>



² ibid

CHAPTER 8
PLAN ADOPTION

TABLE 8.1
RESOLUTION ADOPTION HISTORY

Municipality	2008 HMP Resolution Adoption Date	2014 HMP Resolution Adoption Date	2020 HMP Resolution Adoption Date
Perry County	8/11/2008	6/2/2014	8/24/2020
Blain Borough	10/2/2008	6/5/2014	9/10/2020
Bloomfield Borough	10/7/2008	7/1/2014	9/1/2020
Buffalo Township	-	-	9/8/2020
Carroll Township	11/4/2008	-	-
Centre Township	10/7/2008	-	9/1/2020
Duncannon Borough	11/18/2008	-	9/15/2020
Greenwood Township	9/17/2008	-	8/19/2020
Howe Township	9/11/2008	-	8/20/2020
Jackson Township	8/28/2008	6/26/2014	8/27/2020
Juniata Township	11/12/2008	-	9/9/2020
Landisburg Borough	9/8/2008	-	9/14/2020
Liverpool Borough	-	-	8/19/2020
Liverpool Township	9/2/2008	7/7/2014	9/1/2020
Marysville Borough	9/8/2008	-	9/14/2020
Miller Township	8/26/2008	6/24/2014	8/25/2020
Millerstown Borough	10/6/2008	6/2/2014	9/14/2020
New Buffalo Borough	12/1/2008	-	-
Newport Borough	9/9/2008	-	9/1/2020
Northeast Madison Township	9/2/2008	-	9/1/2020
Oliver Township	10/13/2008	6/9/2014	9/14/2020
Penn Township	8/27/2008	6/25/2014	8/26/2020
Rye Township	8/25/2008	6/23/2014	8/24/2020
Saville Township	10/6/2008	7/7/2014	9/8/2020
Southwest Madison Township	9/29/2008	-	9/28/2020
Spring Township	10/6/2008	-	9/8/2020
Toboyne Township	9/2/2008	-	9/14/2020
Tuscarora Township	10/17/2008	1/3/2017	8/20/20
Tyrone Township	4/7/2009	-	9/1/2020
Watts Township	10/1/2008	-	9/2/2020
Wheatfield Township	10/6/2008	8/4/2014	9/8/2020

PERRY COUNTY RESOLUTION

Perry County Resolution No. 2020-13

Perry County Multi-Jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County ("the County"), is vulnerable to natural hazards such as flooding, and drought and manmade hazards such as transportation, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 County, applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a copy of said plan is attached hereto and incorporated herein by reference thereto.


WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face County.

NOW THEREFORE BE IT RESOLVED by the County of Perry that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the County.


ADOPTED, this the 24th day of August, 2020

ATTEST:




Shannon Hines, Chief Clerk

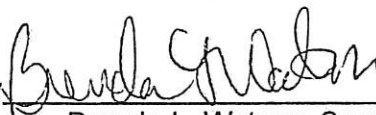
PERRY COUNTY COMMISSIONERS

By 

Brian S. Allen, Chairman

By 

Gary R. Eby, Vice Chairman

By 

Brenda L. Watson, Secretary



MUNICIPAL RESOLUTIONS

Blain Borough Resolution No. 2020-2

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Blain Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and


WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the County.

NOW THEREFORE BE IT RESOLVED by the governing body for Blain Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

ADOPTED, this the 10th day of September, 2020

ATTEST:

Blain Borough Council


Kimberly E Rose --Secretary

By: David Cauffman President

By: Donald Smith Mayor

Council Members at Large:

Nathan Book

Jake Saltzburg

Michael Worthington

Greg Wileman

Melody Turman

Bloomfield Borough Resolution No. 2020-04

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Bloomfield Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and man-made hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.

NOW THEREFORE BE IT RESOLVED by the governing body for Bloomfield Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

ADOPTED, this the 1st day of September, 2020

ATTEST:

Danielle L. Shope

Secretary

Bloomfield Borough Council

By [Signature]

By Eric J. Rupp - VICE PRESIDENT

By Arlis J. Krammes - Mayor

Buffalo Township Resolution No. 20-03

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Buffalo Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Buffalo Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 17th day of August, 2020

ATTEST:

A circular seal with the text "BUFFALO TOWNSHIP" around the perimeter and "1817" at the bottom. In the center, the name "Nancy Canquoli" is written in cursive and underlined.

Nancy Canquoli

Buffalo Township Board of Supervisors

By Art Lindsay

By Gary L. Wilton

By [Signature]

Centre Township Resolution No. 2020-6

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Centre Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Centre Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 1st day of September, 2020


ATTEST:

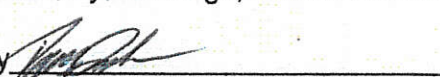


Diana McPherson, Secretary

Centre Township Board of Supervisors

By 
Colin Reynolds, Chairman

By 
Jeremy Lockridge, Vice Chairman

By 
Rick Burkholder, Supervisor

Duncannon Borough Resolution No. 2020-1

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Duncannon Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

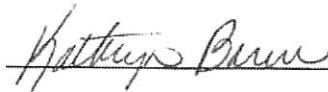
WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the County.

NOW THEREFORE BE IT RESOLVED by the governing body for Duncannon Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

ADOPTED, this the 15th day of September, 2020

ATTEST:

Duncannon Borough Council



By 

Jeffrey Kirkhoff – President

Adopted by a unanimous 6-0 vote of
Duncannon Borough Council

Greenwood Township Resolution No. 2020-1

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Greenwood Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

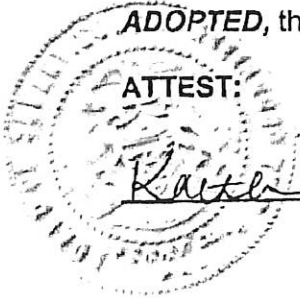
WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Greenwood Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 19th day of August, 2020

ATTEST:

Greenwood Township Board of Supervisors



Kathleen M. Black

By *[Signature]*

By *Lewis A. Moore*

By *[Signature]*

Howe Township Resolution No. 20-08

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Howe Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

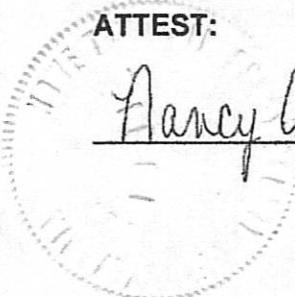
WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Howe Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 20th day of August, 2020

ATTEST:


Nancy Langioti

Howe Township Board of Supervisors

By Dale W. Beaver

By Charles W. Burt

By Karen Dancy

Jackson Township Resolution No. 01-2020

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Jackson Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Jackson Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 27th day of August, 2020

ATTEST:

Darlene R. Smith (Sec)

Jackson Township Board of Supervisors

By William A. Smith

By Brad A. Smith

By Jeff Trone

Juniata Township Resolution No. 2020-1

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Juniata Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Juniata Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 9th day of September, 2020

ATTEST:

Juniata Township Board of Supervisors

Sara Hinkle

By [Signature]

By [Signature]

By [Signature]



Landisburg Borough Resolution No. 2020-02

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Landisburg Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and


WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.

NOW THEREFORE BE IT RESOLVED by the governing body for Landisburg Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

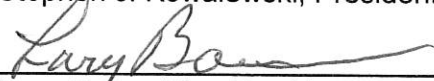
ADOPTED, this the 14 day of September, 2020

ATTEST:

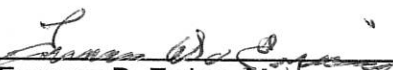
Landisburg Borough Council



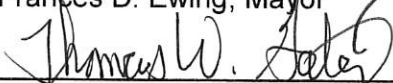
Stephen J. Kowalewski, President



Larry Baum, Vice-President



Frances D. Ewing, Mayor



Thomas W. Gates, Secretary / Treasurer

Resolution No. 01-2020

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Liverpool Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.

NOW THEREFORE BE IT RESOLVED by the governing body for Liverpool Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

ADOPTED, this the 19 day of August, 2020

ATTEST:

Janine Matte
Secretary/Treasurer

Liverpool Borough Council

By [Signature] President

By [Signature] Mayor

By _____

By _____

By _____

Liverpool Township Resolution No. 3

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Liverpool Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

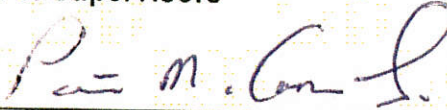
NOW THEREFORE BE IT RESOLVED by the governing body for Liverpool Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

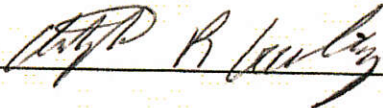
ADOPTED, this the 1st day of September , 2020

ATTEST:



Liverpool Township
Board of Supervisors

By 

By 



Resolution No. 331

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Marysville Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.


NOW THEREFORE BE IT RESOLVED by the governing body for Marysville Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

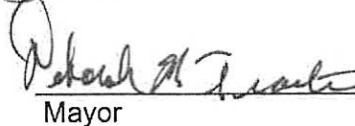
ADOPTED, this the 14th day of September, 2020

ATTEST:


Secretary

Marysville Borough Council


Council President


Mayor

Miller Township Resolution No. 2020-1

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Miller Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Miller Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 25 day of August, 2020

ATTEST:

Joyce A. Stultz

Miller Township Board of Supervisors

By

By

By

Resolution No. 2020-02

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Millerstown Borough are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.

NOW THEREFORE BE IT RESOLVED by the governing body for Millerstown Borough that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough.

ADOPTED, this the 14th day of September, 2020

ATTEST:

Heron Kullberg, Sec

Millerstown Borough Council

By *Kim B. H.*

By *Christina A. H.*

By *Rachel D.*

By *D. - Slous*

By *Pat S.*

Resolution # 9-20

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and the Borough of Newport are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 counties of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Borough.

NOW THEREFORE BE IT RESOLVED by the governing body for the Borough of Newport, that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Borough of Newport.

ADOPTED, this the 1ST day of September, 2020

Newport Borough Council

Tami J. Halstead By Tami J. Halstead President
Print Signature

BARBARA J. LEACH By Barbara J. Leach Vice President
Print Signature

Mary Bucher By Mary Bucher Councilor
Print Signature

Penny Frowder By Penny Frowder Councilor
Print Signature

Jacob Zentichko
Print

By *Jacob Zentichko* Councilor
Signature

Greg Shope
Print

By *Greg Shope* Councilor
Signature

Carl R Roush
Print

By *Carl R Roush* Councilor
Signature

Resolved this September 1st, 2020

ATTEST:

NEWPORT BOROUGH COUNCIL

Tina Burkholder
Secretary

Jamie J. Helsted
President of Council

(Seal)

Northeast Madison Township Resolution No. R-03-20

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Northeast Madison Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

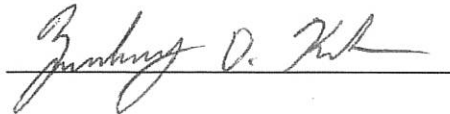
WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

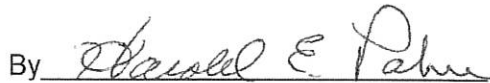
NOW THEREFORE BE IT RESOLVED by the governing body for Northeast Madison Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

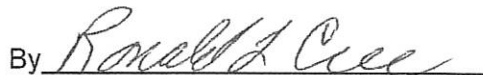
ADOPTED, this the 1st day of September, 2020

ATTEST:

**Northeast Madison Township
Board of Supervisors**



By 

By 

By 

Oliver Township Resolution No. 2020-012

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Oliver Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

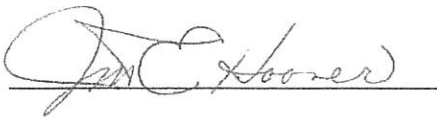
WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

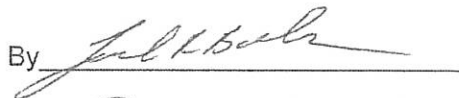
NOW THEREFORE BE IT RESOLVED by the governing body for Oliver Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

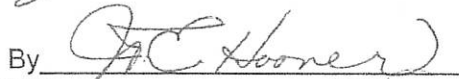
ADOPTED, this the 14th day of Sept., 2020

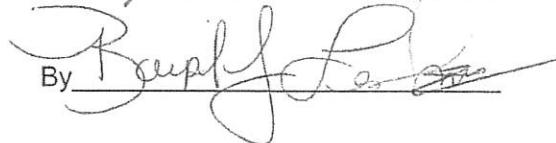
ATTEST:

Oliver Township Board of Supervisors



By 

By 

By 



Penn Township Resolution No. 2020-06

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Penn Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Penn Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 26 day of Aug, 2020

ATTEST:



Penn Township Board of Supervisors

By Jane F. Bogus

By [Signature]

By [Signature]

**Rye Township
Resolution No. 20-24**

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Rye Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

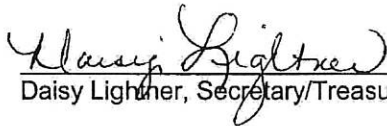
WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Rye Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

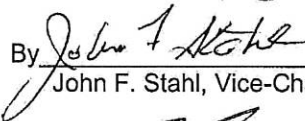
ADOPTED, this the 24 day of August 2020.


ATTEST:

Rye Township Board of Supervisors


Daisy Lightner, Secretary/Treasurer

By  24 Aug 2020
James M. Sabo, Chairman

By 
John F. Stahl, Vice-Chairman

By 
John C. Schulze, Supervisor

Saville Township Resolution No. 7-2020

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Saville Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Saville Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 8th day of SEPT, 2020

ATTEST:

Jerry K. Ulrich

Saville Township Board of Supervisors

By Gregory L. Loh

By James K. Wilson

By Douglas B. VHA

Southwest Madison Township Resolution No. 1-2020

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Southwest Madison Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Southwest Madison Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 28th day of September, 2020

ATTEST:

Judy A. Campbell

**Southwest Madison Township
Board of Supervisors**

By Hugh B. McMillin

By Eugene B. Murray

By Charles C. Odain

Spring Township Resolution No. 2020-01

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Spring Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Spring Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 8th day of September, 2020

ATTEST:

Henry J. Campbell

Spring Township Board of Supervisors

By DA Walt

By Dan McLean

By Jose L. Amador

Toboyne Township Resolution No. 09142020T

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Toboyne Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

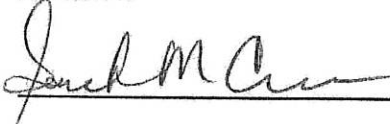
WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Toboyne Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 14 day of September, 2020

ATTEST:



Toboyne Township Board of Supervisors

By 

By 

By _____

Tuscarora Township Resolution No. 15-2020

Perry County Multi-Jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Tuscarora Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 and outlines processes for identifying their respective natural hazards, risks and vulnerabilities, and

WHEREAS, the county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

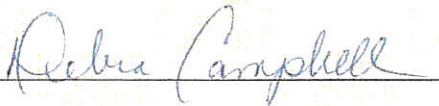
WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE, BE IT RESOLVED, by the governing body for Tuscarora Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

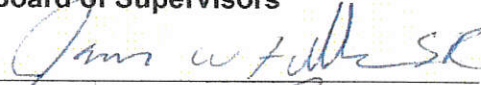
ADOPTED this 20th day of August 2020

ATTEST:




Reba Campbell

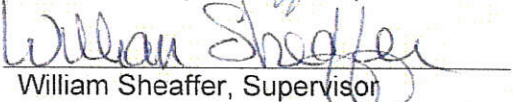
**Tuscarora Township
Board of Supervisors**



James Fuller, Chairperson



Patrick McIntyre, Co-Chairperson



William Sheaffer, Supervisor

Tyrone Township Resolution No. 2020-02

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Tyrone Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

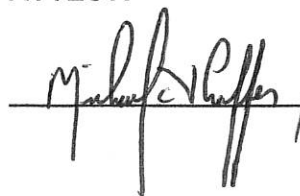
WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Tyrone Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 1ST day of SEPTEMBER 2020

ATTEST:

 Michael Ruff, SECRETARY

Tyrone Township Board of Supervisors

By Robert E. Clouser

By Edward C. Clout

By Michael Ruff

Watts Township Resolution No.20-04

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Watts Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Watts Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 2nd day of September, 2020

ATTEST:

Watts Township Board of Supervisors

Nancy Carquoli

By [Signature]

By [Signature]

By [Signature]

Wheatfield Township Resolution No. 01-2020

Perry County Multi-jurisdictional Hazard Mitigation Plan

WHEREAS, Perry County and Wheatfield Township are vulnerable to natural hazards such as flooding, severe winter weather, and drought, and manmade hazards such as transportation incidents, and can result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, 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 county of Perry applied and received a federal Pre-Disaster Mitigation (PDM) grant to develop and submit for approval their respective multi-jurisdictional hazard mitigation plans, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan has been developed by the Perry County Board of Commissioners in cooperation with its participating municipal governments, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the plan, and

WHEREAS, the Perry County Multi-jurisdictional Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural and man-made hazards that face the Township.

NOW THEREFORE BE IT RESOLVED by the governing body for Wheatfield Township that the Perry County Multi-jurisdictional Hazard Mitigation Plan is hereby adopted as the official mitigation plan of the Township.

ADOPTED, this the 8th day of September, 2020

ATTEST:

**Wheatfield Township
Board of Supervisors**

Vicki Jenkins

By Bryce Slye CHAIRMAN

By James L. Fulla Vice Chairman

By Myra Smith Supervisor