MCM Consulting Group, Inc.

Lawrence County 2015 Hazard Mitigation Plan

Lawrence County Department of Public Safety

Certification of Annual Review Meetings

YEAR	DATE OF MEETING	PUBLIC OUTREACH ADDRESSED?*	SIGNATURE
2016			
2017			
2018			
2019			
2020			

Record of Changes

DATE	DESCRIPTION OF CHANGE MADE, MITIGATION ACTION COMPLETED, OR PUBLIC OUTREACH PERFORMED	CHANGE MADE BY (PRINT NAME)	CHANGE MADE BY (SIGNATURE)
08/11/15	Updated hazard profiles and added the following: Earthquake Hurricane and Tropical Storm Invasive Species Radon Exposure Wildfire Civil Disturbance Disorientation Drowning Transportation Accidents Updated Mitigation Action plan and worked with municipalities to develop new project opportunities.	Michael Rearick	

REMINDER: ***Please attach all associated meeting agendas, sign-in sheets, handouts and minutes.***

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1. Introduction

1.1. Background

The Lawrence County Board of Commissioners, in response to the Disaster Mitigation Act of 2000 (DMA 2000), spearheaded a countywide hazard mitigation planning effort to prepare, adopt and implement a multi-jurisdictional Hazard Mitigation Plan (HMP) for Lawrence County and all of its 27 municipalities. The Lawrence County Department of Public Safety and Planning Department was charged by the County Board of Commissioners to prepare the 2010 plan. The 2010 HMP has been utilized and maintained during the 5 year life cycle.

In July of 2013, the Lawrence County Commissioners were successful in securing hazard mitigation grant funding to update the county hazard mitigation plan. The funding was available due to federal response and mitigation from severe flooding in 2011 and the subsequent issuance of a presidential disaster declaration in Pennsylvania. The Lawrence County Commissioners assigned the Lawrence County Department of Public Safety and Planning Department with the primary responsibility to update the hazard mitigation plan. MCM Consulting Group, Inc. was selected to complete the update of the HMP. A local hazard mitigation planning team was developed comprised of government leaders and citizens from Lawrence County. This updated HMP will provide another solid foundation for the Lawrence County Hazard Mitigation Program.

Hazard mitigation describes sustained actions taken to prevent or minimize long-term risks to life and property from hazards and to create successive benefits over time. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the disaster cycle of damage, reconstruction and repeated damage. With careful selection, successful mitigation actions are cost-effective means of reducing risk of loss over the long-term.

Hazard mitigation planning has the potential to produce long-term and recurring benefits. A core assumption of mitigation is that current dollars invested in mitigation practices will significantly reduce the demand for future dollars by lessening the amount needed for recovery, repair and reconstruction. These mitigation practices will also enable local residents, businesses and industries to reestablish themselves in the wake of a disaster, getting the economy back on track sooner and with less interruption.

1.2. Purpose

The purpose of this All-Hazard Mitigation Plan (HMP) is:

To protect life, safety and property by reducing the potential for future damages and economic losses that result from natural hazards;

- To qualify for additional grant funding, in both the pre-disaster and the post-disaster environment;
- To speed recovery and redevelopment following future disaster events;
- To demonstrate a firm local commitment to hazard mitigation principles; and
- To comply with both state and federal legislative requirements for local hazard mitigation plans.

1.3. Scope

This Lawrence County Multi-Jurisdictional Hazard Mitigation Plan (HMP) serves as a framework for saving lives, protecting assets and preserving the economic viability of the 27 municipalities in Lawrence County. The HMP outlines actions designed to address and reduce the impact of a full range of natural hazards facing Lawrence County, including drought, earthquakes, flooding, tornados, hurricanes/tropical storms and severe winter weather. Manmade hazards such as transportation accidents, hazardous materials spills and fires are also addressed.

A multi-jurisdictional planning approach was utilized for the Lawrence County HMP update, thereby eliminating the need for each municipality to develop its own approach to hazard mitigation and its own planning document. Further, this type of planning effort results in a common understanding of the hazard vulnerabilities throughout the county, a comprehensive list of mitigation projects, common mitigation goals and objectives and an evaluation of a broad capabilities assessment examining policies and regulations throughout the county and its municipalities.

1.4. Authority and Reference

Authority for this plan originates from the following federal sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended
- National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 *et seq.*

Authority for this plan originates from the following Commonwealth of Pennsylvania sources:

- Pennsylvania Emergency Management Services Code. Title 35, Pa C.S. Section 101
- Pennsylvania Municipalities Planning Code of 1968, Act 247 as reenacted and amended by Act 170 of 1988
- Pennsylvania Stormwater Management Act of October 4, 1978. P.L. 864, No. 167

The following Federal Emergency Management Agency (FEMA) guides and reference documents were used to prepare this document:

- FEMA 386-1: *Getting Started*. September 2002
- FEMA 386-2: *Understanding Your Risks: Identifying Hazards and Estimating Losses*. August 2001
- FEMA 386-3: *Developing the Mitigation Plan*. April 2003
- FEMA 386-4: *Bringing the Plan to Life*. August 2003
- FEMA 386-5: *Using Benefit-Cost Review in Mitigation Planning*. May 2007
- FEMA 386-6: *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning*. May 2005
- FEMA 386-7: *Integrating Manmade Hazards into Mitigation Planning*. September 2003
- FEMA 386-8: *Multijurisdictional Mitigation Planning*. August 2006
- FEMA 386-9: *Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects*. August 2008
- FEMA *Local Multi-Hazard Mitigation Planning Guidance*. July 1, 2008
- FEMA *National Fire Incident Reporting System 5.0: Complete Reference Guide*. January 2008

The following Pennsylvania Emergency Management Agency (PEMA) guides and reference documents were used to prepare this document:

- PEMA: *Hazard Mitigation Planning Made Easy!*
- PEMA Mitigation Ideas: *Potential Mitigation Measures by Hazard Type: A Mitigation Planning Tool for Communities*. March 6, 2009
- PEMA: *Standard Operating Guide*. October 18, 2013

The following document produced by the National Fire Protection Association (NFPA) provided additional guidance for updating this plan:

- NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity Programs*. 2010

2. Community Profile

2.1. Geography and the Environment

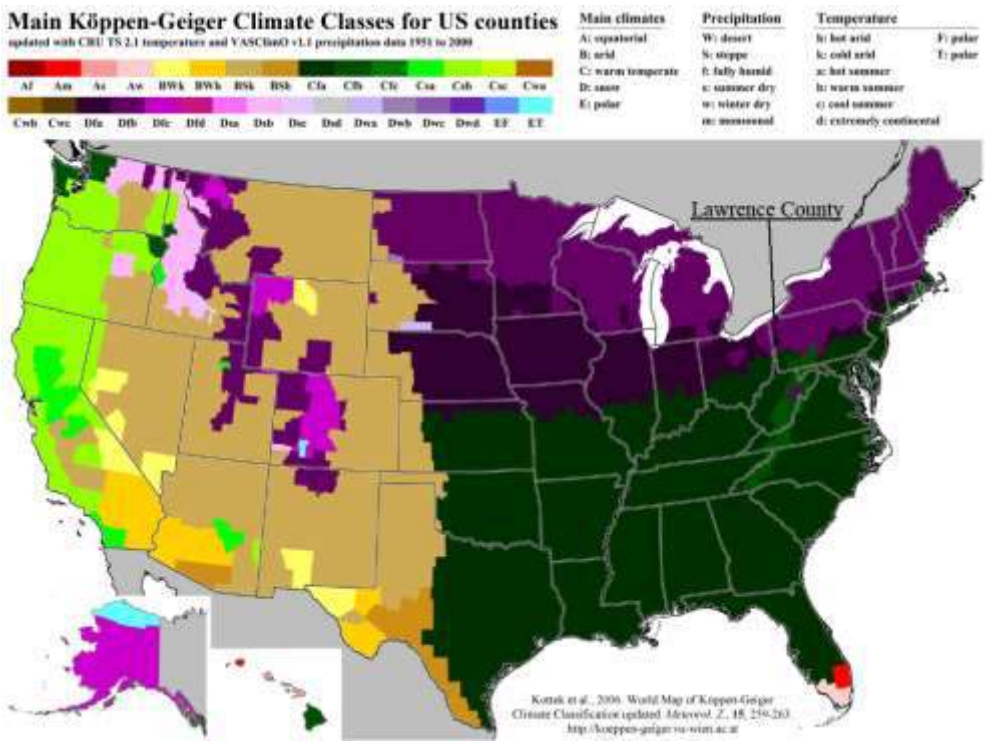
Lawrence County was created on March 20, 1849, from parts of Beaver and Mercer Counties due to the rapid growth of New Castle, which was primarily in Mercer County but was rapidly expanding into Beaver County. The former borders between Beaver and Mercer Counties are still evident in Lawrence County today, as the northern borders of North Beaver Township, Shenango Township and Slippery Rock Township with (respectively) the southern borders of Mahoning Township, Hickory Township and Scott Township make up the former boundaries between Beaver and Mercer Counties. In addition, County Line Street in New Castle where the Lawrence County Courthouse is located also marks the former boundaries.

According to the U.S. Census Bureau, the county has a total area of 363 square miles (940.2 km2), of which 358.2 square miles (927.7 km2) is land and 4.5 square miles (11.7 km2) (1.2%) is water. Major waterways are the Shenango River, Neshannock Creek and the Mahoning River which form the Beaver River. Also, the Slippery Rock Creek and Connoquenessing Creak empty into the Beaver River.

Lawrence County on average receives 38 inches of rain per year. The US average is 37. Snowfall averages 32 inches in comparison to the average U.S. city receiving 25 inches of snow per year. The number of days with any measurable precipitation is 153. On average, there are 161 sunny days per year in Lawrence County. The warmest month is July where the high is around 85 degrees and the coldest month is January with an average low of 19.

The Koppen-Geiger Climate Areas map classifies Lawrence County and the rest of Pennsylvania, as Humid Continental (See *Figure 1 - Koppen-Geiger Climate Map*). While counties of Pennsylvania share many weather similarities, there are also a few unique characteristics to certain regions.

Figure 1 - Koppen-Geiger Climate Map



Lawrence County is located in the west central region of Pennsylvania, sharing its western border with the state of Ohio. The weather patterns and climatic conditions of Lawrence County are a major risk factor. The county's weather extremes are the primary contributors to many of the county's natural hazard events, including flash floods, hurricanes, tropical depressions, blizzards, tornados, drought, high wind and lightning.

2.2. Community Facts

Although it is well known that various Indian civilizations inhabited the county prior to its settlement by the European migrants, little definitive knowledge is available on this portion of Lawrence County's history.

At the time of the first excursions of white men into the area, the Delaware Tribe was the predominating tribe. Their capital was located in the general New Castle area, named Kus-Kus-Ki. The settlement of Lawrence County had its foundations laid with the colonization movements of the Seventeenth Century. Even though the first colony in the Commonwealth was founded under a Dutchman named Peter Miniut, William Penn must be regarded as the real "father of Pennsylvania".

King Charles II of England gave Penn a Royal Charter on April 2, 1861, as proprietor and governor of this land. Although armed with a Royal Charter, Penn also came to the country and made treaties with the Indian tribes to secure his colony.

Between the time of Penn's Charter and the year of 1758, there were undoubtedly various trappers, hunters and explorers within the Lawrence County area. It was not until 1750, however, that we have historical evidence of a visit. In that year, Christian Frederick Post visited local Indian tribes to argue the cause of the English before them as part of the French and English power struggle in the New World.

In 1770, twelve years later, there is evidence that two Moravian missionaries, Zeisberger and Sensemen, founded a settlement near Moravia along the Beaver River. These men, leading a band of Christian Delaware Indians, developed a town known as Friedenstadt (City of Peace). Evidently the settlement continued until 1773, when the group moved into the Ohio area. Their church and buildings were destroyed and no trace of Friedenstadt was left.

According to the United States Office of Management and Budget, Lawrence County is designated as the New Castle, PA micropolitan statistical area; ranking as the 3rd most populous micropolitan area in Pennsylvania in the 2010 U.S. Census. Lawrence County is also a part of the Pittsburgh-New Castle-Weirton, PA-OH-WV combined statistical area.

The following cities, boroughs and townships are located in Lawrence County:

City:

New Castle (county seat)

Boroughs:

Bessemer, Ellport, Ellwood City (partly in Beaver County), Enon Valley, New Beaver, New Wilmington, S.N.P.J., South New Castle, Volant, Wampum

Townships:

Hickory, Little Beaver, Mahoning, Neshannock, North Beaver, Perry, Plain Grove, Pulaski, Scott, Shenango, Slippery Rock, Taylor, Union, Washington, Wayne and Wilmington

Today, Lawrence County has over 43,500 people in the civilian labor force, with 40,000 employed. There is an unemployment rate of 8.1% in Lawrence County. The unemployment rate for the Commonwealth of Pennsylvania is 7.8%. Source: Lawrence County Economic Development Corporation. See *Figure 2 - Occupation Classifications.*

Table 1 - Top Employers

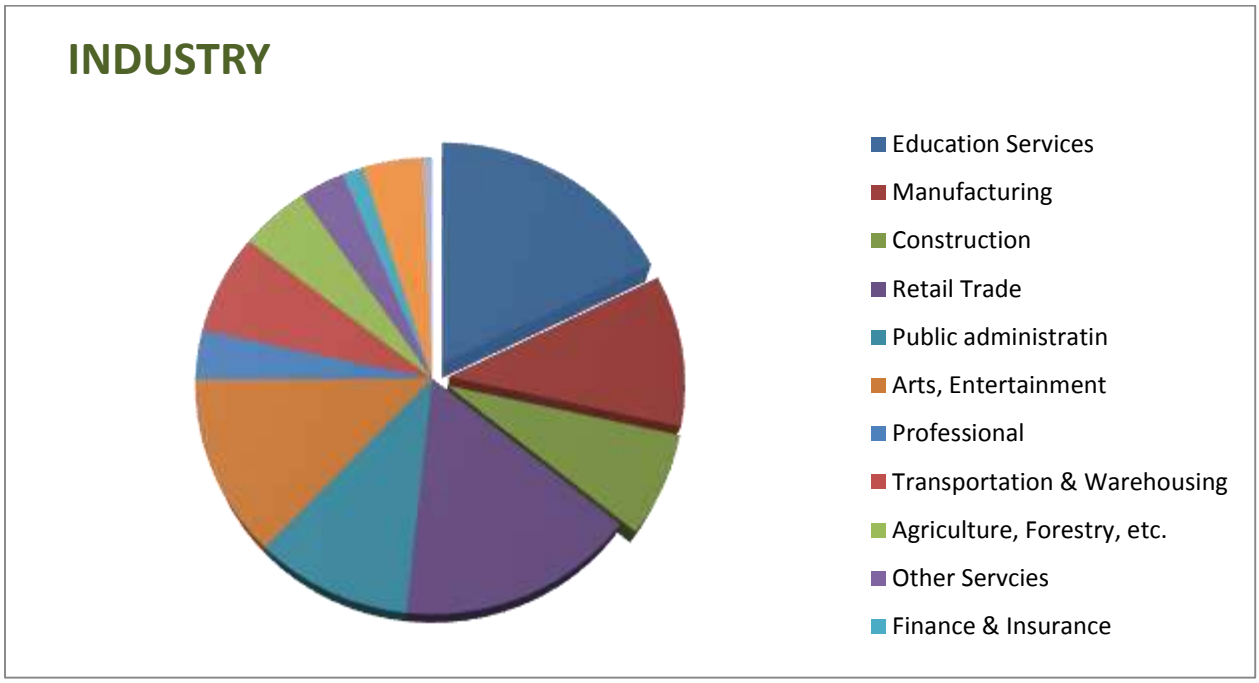
Lawrence County Top Employers	
Company	**Industry**
Jameson Memorial Hospital	Healthcare
Commonwealth of Pennsylvania	Public Services
Liberty Mutual Insurance Company	Insurance
The Tamarkin Company	Grocery
New Castle Area School District	Education Services
Westminster College	Education Services
Wal-Mart Associates Inc.	Retail
County of Lawrence	Public Services
Ellwood City Hospital	Healthcare
Federal Government	Public Services
Cennial Company Inc.	Fast Food
Sanitors Services Inc.	
Ellwood City Area School District	Education Services
Dairy Farmers of America Inc.	Food Manufacturer
Ellwood City Forge Company	Heavy Manufacturing
Mohawk Area School District	Education Services
Human Services Center	
Golden Hill Nursing Home Inc.	Healthcare
Wilmington Area School District	Education Services
Laurel School District	Education Services
Source: Lawrence County Economic Development Corporation http://www.lawrencecounty.com/Top-50-Employers.htm	

Occupation within Lawrence County is classified under the following categories with the associated percentage of civilians employed at 16 years of age and over:

- Management, business, science and arts occupations 20.3%
- Production, transportation and material moving occupations 21.1%
- Service occupations 25.5%
- Sales and office occupations 22.2 %
- Natural resources, construction and maintenance occupations 10.9%

Education services, healthcare and social assistance; public administration; retail trade; manufacturing and arts, entertainment and recreation were classified as the largest employers during the 2010 Census; encompassing over half of the workers. See *Figure 2 - Occupation Classifications.*

Figure 2 - Occupation Classifications



Source: 2010 US Census Information – Lawrence County, Pennsylvania.

2.3. Population and Demographics

Lawrence County is classified politically as a fifth class county. The 2010 population was 91,108 people. Lawrence County is composed of 1 city, 10 boroughs and 16 townships. The populations per municipality are identified in *Table 2 - Municipal Population* below. Population density is 254.4 people per square mile.

In Lawrence County 21,823 residents are under the age of 18, 52,157 are age 18-64 and 17,128 are age 65 or older. The median age is 43.6 within the county. In accordance with the 2010 census, 85,484 were white, 3,501 were black/African American and 2,123 were other race.

There were 37,126 households in 2010. 50.0% were married couples with children, 28.9% were married couples with no children, 8.2% were single parent households, 12.9% were single person households and 9.6% were other types of households. The average household size is 2.39 and the average family size is 2.94. Lawrence County has a median household income of $44,079.00 with a median per capita income of $22,722.00.

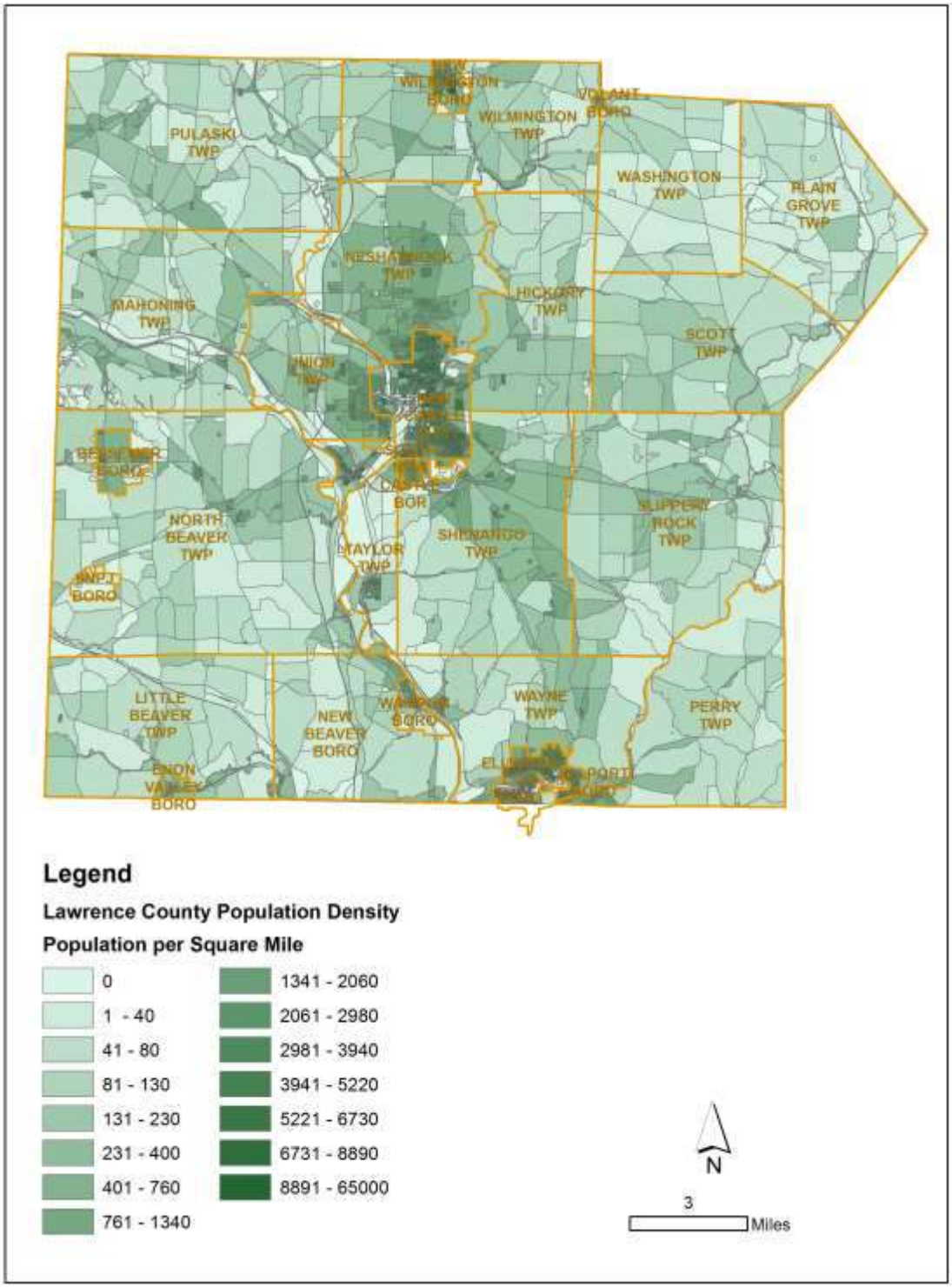
Table 2 - Municipal Population

Lawrence County Municipality Populations			
Municipality	**Population**	**Municipality**	**Population**
City of New Castle	23,273	Neshannock	9,609
Bessemer Borough	1,111	North Beaver	4,121
Ellport	1,180	Perry	1,938
Ellwood City	7,289	Plain Grove	813
Enon Valley	306	Pulaski	3,452
New Beaver	1,502	Scott	2,347
New Wilmington	2,466	Shenango	7,479
S.N.P.J. Borough	19	Slippery Rock	3,283
South New Castle	709	Taylor	1,052
Volant Borough	168	Union	5,190
Wampum Borough	717	Washington	799
Hickory Township	2,470	Wayne	2,606
Little Beaver	1,411	Wilmington	2,715
Mahoning	3,083		
Source: 2010 Census Bureau			

There are fourteen major transportation routes within the county: Interstate 79, 376 and 76; State Routes 18, 65, 108, 168, 351, 388, 488 and 551 and US Routes 19, 224 and 422. Lawrence County is also 12 miles away from Interstate 80.

Troop D, New Castle Station of the Pennsylvania State Police provides state law enforcement coverage to Lawrence County; along with 16 township or borough police agencies within the county. The Lawrence County Sheriff has countywide jurisdiction as well. Twenty-two fire stations provide emergency services to the county. There are 2 hospitals within Lawrence County and numerous hospitals in close proximity to the county. Source: www.leoc.net/first-responder-directory.

Figure 3 - Population Density Map



2.4. Land Use and Development

The county consists of rolling lands cut by major streams, except in the southeastern portion, which is unglaciated and as a result has a steep topography. A large percentage (41%) of the county's soil has characteristics which, when generalized, resemble the Ravenna type (deep, somewhat poorly drained, nearly level and undulating soils on till plains formed in glacial till material) and are located (with the exception of the unglaciated southeastern section) throughout the entire county. The three other major soil groups in the county are the Canfield soils (16%), Cotton soils (12%) and the Gilpin soils (14%) which are only found in the southeastern section of the county.

Soils suitable for agriculture for the major portion of the county fall in the Class II and Class III range, with cropland suitability classes ranging from I to IV. Class I soils have few limitations and are best suited for cropland while Class IV soils have severe limitations. Soils in Classes V through VII are generally unsuited for cropland and as the Class numbers get higher, have increasing limitations as well.

Therefore, the county contains a moderately high capability for sustainable agriculture. Common limitations experienced throughout the county, especially in the glaciated section, are seasonal wetness in low spots, erosion on exposed hillsides and occasional stoniness from past glacial deposits.

The glacial till soils of the northeastern and north-central section of the county (Plain Grove, Washington and Wilmington Township) are the most extensive supporters of agricultural activities of a wide commercial value. Dairying ranks as the principal type of farming with considerable poultry rising as well. A sizable portion of the county's well drained land is used for intensive cultivation of cropland.

The northwest corner of the county (Pulaski Township) displays a high grade of agricultural productivity with relatively flat land and gentle to moderate slopes. The sandstone, shale and limestone-mixed till supports specialized farming in the form of mature orchards, dairy and beef cattle farming and raising of hays and grain. Much of the area, which is mostly bushy and or low productivity, remains in woodland and unimproved pastures.

The west central part of the county (North Beaver Township, Mahoning Township and a section of Little Beaver Township) has a relatively high distribution of farming activity. The principal type of farming is dairy with other livestock, poultry, orchards and grain and hay production. Strip mining of limestone and coal has affected large areas that were formerly agricultural lands. Many of the former farms are presently idle and used as a rural residence.

Agrarian activity in the other section of the county is less extensive. The southeast, for example, has a considerable number of farms, but steep slopes, wooded areas, public

lands and forests cover much of the land area. Many of this area's valuable farms have been leased by coal and limestone strip mining operations.

Approximately 92,000 acres (about 40%) of Lawrence County is both public and privately owned forestland. The native forest vegetation in the county is the eastern hardwood: oak, hickory, maple, walnut, wild cherry, ash and many others.

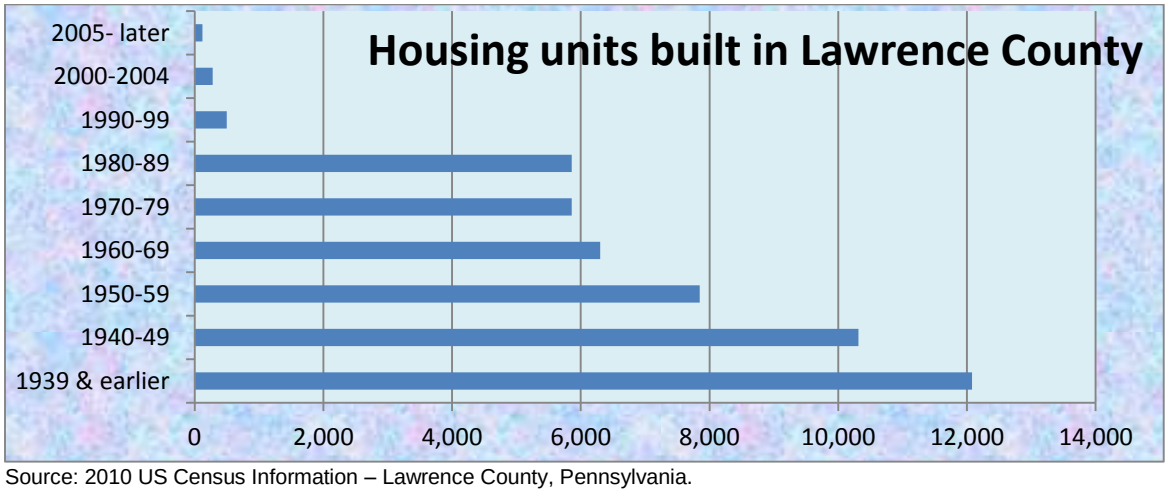
The soils are not well drained and inhibit development in areas where public sewers are not available. These areas must often use acceptable (passes perc tests) on-lot sewage to allow for development.

The two major urban centers in the county are the City of New Castle and Ellwood City Borough. Most of the population is located within the urban centers and the townships that surround them. The balance of the county's residents are scattered in rural areas and small boroughs or townships.

According to the 2010 U.S. Census, Lawrence County has a total of 40,975 housing units. Of the available housing units 90.6% are occupied. The majority of these housing units were built prior to 1939. From 2000 or later there was only an increase of 7.0% of housing units built. *Figure 4 - Housing Units* outlines the quantity of housing units built prior to 1939 through 2005 or later.

The total number of farms as of 2012 is 659 farms. The average size of a Lawrence County farm is 122 acres. Of the 659 farms, 204 are considered very small farms (Under 50 acres), 339 are small farms (50-179 acres), 76 are medium size farms (180-499 acres) and 24 are large farms (500+ acres). The estimated market value of land and buildings is $501,195. The average market value of products sold per farm in Lawrence County is $58,450.00.

Figure 4 - Housing Units



Source: 2010 US Census Information – Lawrence County, Pennsylvania.

2.5. Data Sources and Limitations

The county relied heavily on existing data sources developed by other Lawrence County departments, including:

- Lawrence County Hazard Vulnerability Analysis.
- Lawrence County Comprehensive Plan.
- Lawrence County Assessment Department data.
- Lawrence County Subdivision and Land Development Ordinance.
- Lawrence County Open Space Management Plan.
- Lawrence County Greenways Plan
- Lawrence County Digital Tax Assessment Data.
- Lawrence County Commodity Flow Study.

The following are additional data sources used during the update process:

- U.S. Census Bureau.
- National Climatic Data Center (NCDC).
- National Oceanic and Atmospheric Administration (NOAA).
- Pennsylvania Department of Conservation and Natural Resources.
- Pennsylvania Groundwater Information System.
- Pennsylvania Emergency Incident Reporting System.
- Pennsylvania Emergency Management Agency.

The countywide Digital Flood Insurance Rate Maps (DFIRM), were used for all flood risk analysis and estimation of loss. The Lawrence DFIRMs were approved and effective in January 18, 2012. The DFIRM database provides flood frequency and elevation information used in the flood hazard risk assessment. Other Lawrence County GIS datasets including road centerlines, parcels and structures were utilized in conjunction with the DFIRM. In addition to the county's existing spatial datasets, the Lawrence County Planning Department developed a database and maps of the county's critical facilities, special needs populations, transportation systems and hazardous materials facilities. Potential losses were then analyzed by using existing county tax assessment data and DFIRM data.

Geographic Information Systems (GIS) Data

GIS data was utilized in risk assessment, estimation of loss and the development of map products for the hazard mitigation plan update. A core foundation of data was available from the Lawrence County Department of Public Safety and Lawrence County Planning Department. Some data was downloaded from the Pennsylvania Spatial Data Access (PASDA) and utilized**. The following is a list of existing GIS data that was utilized in the plan update process and a list of new GIS data that was developed to complete the 2015 mitigation plan update.**

Existing Lawrence County GIS Data Used:

- Structures
- Road Centerlines
- Driveways
- Elevations of the county
- Tax Parcels
- Municipality Boundaries
- Digital Flood Insurance Rate Maps
- Watershed and Sub-sheds
- Lakes and Streams

New GIS Data Developed and Used:

- Critical Facilities
- Mobile Homes
- Mobile Home Parks
- Utility Locations
- Tornado Paths

The Lawrence County parcel dataset includes a value for the land in each parcel, as well as a combined value for all buildings on each parcel. Some parcels that contain multiple buildings with one or more buildings in the flood plain and one or more buildings out of the flood plain. The individual value by specific building within any given parcel was indeterminate from the data provided by Lawrence County. Therefore the combined value of all buildings in that parcel has been used – not simply the value of only the structures in the floodplain.

Mobile home parks depicted in the "Lawrence County Tornado Risk" map were provided by Lawrence County as parcel polygons. The total building values in these parcels designated as mobile home parks were used to estimate the possible economic loss associated with a disaster.

HAZUS calculations and statistics were based on a total of 131 reaches. There were zero failed reaches.

The following maps provide a base map of Lawrence County and other specific features of the county.

Figure 5 - Lawrence County Base Map

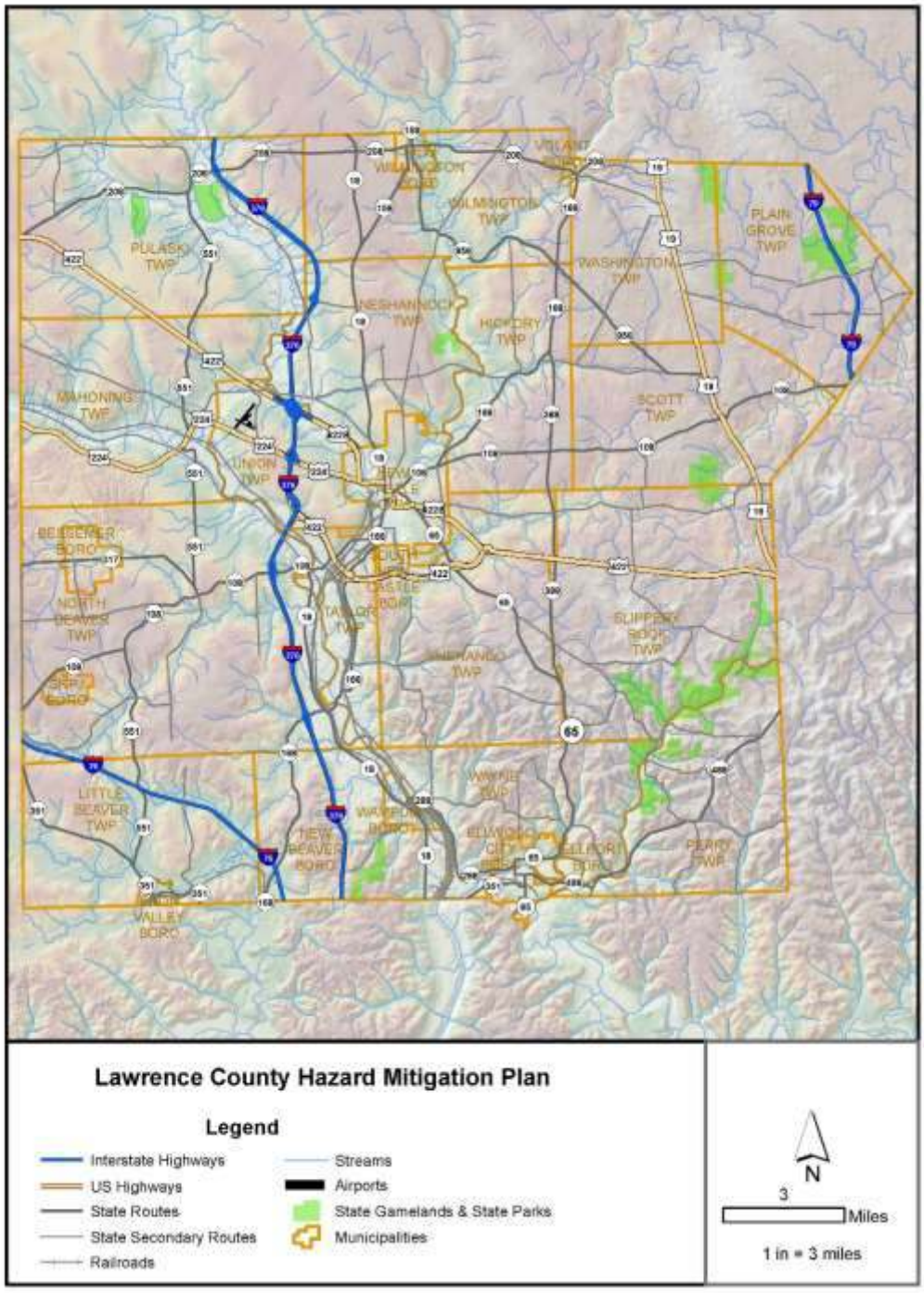


Figure 6 - Land Use/Land Cover Map

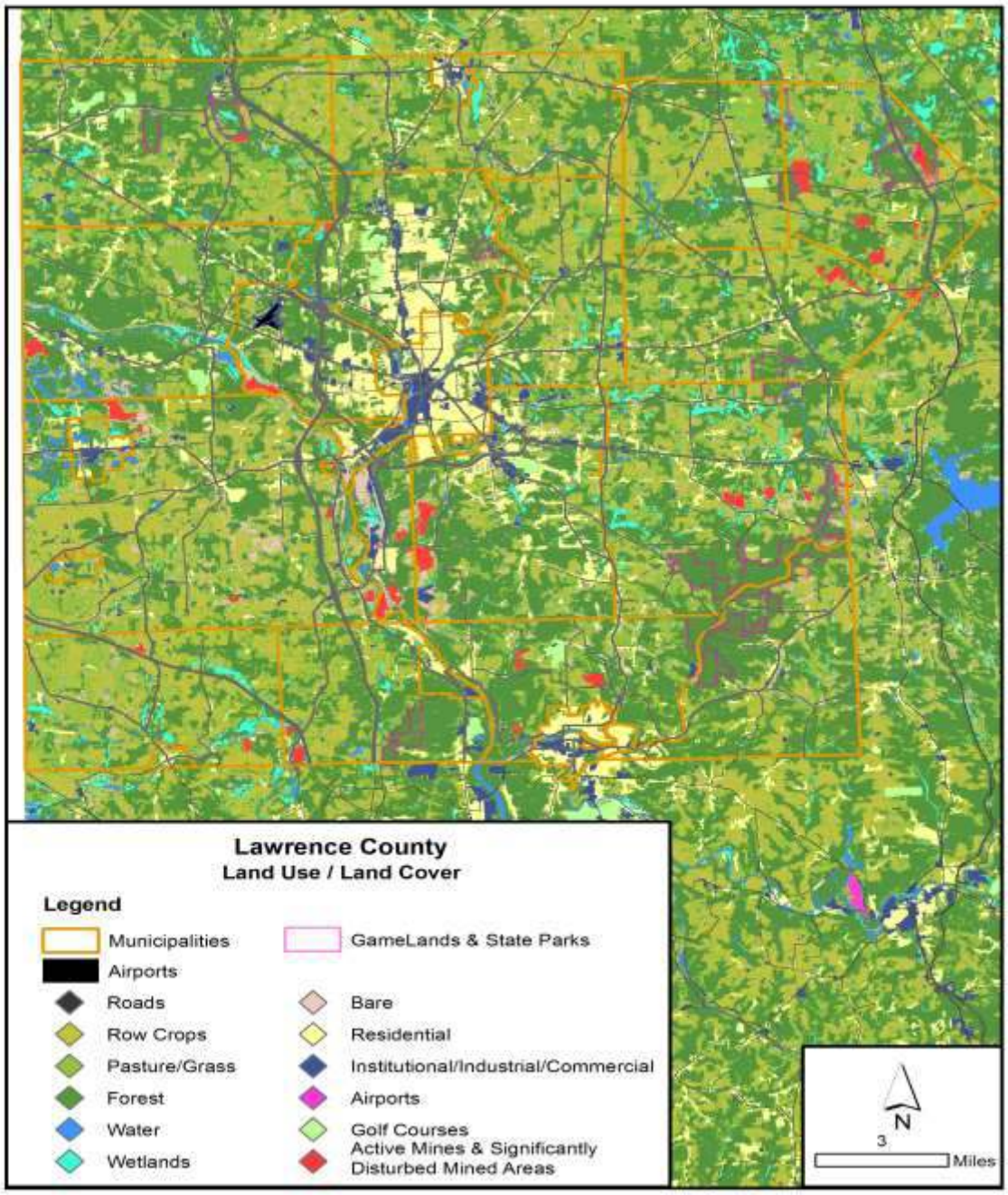


Figure 7 - Recreation Features

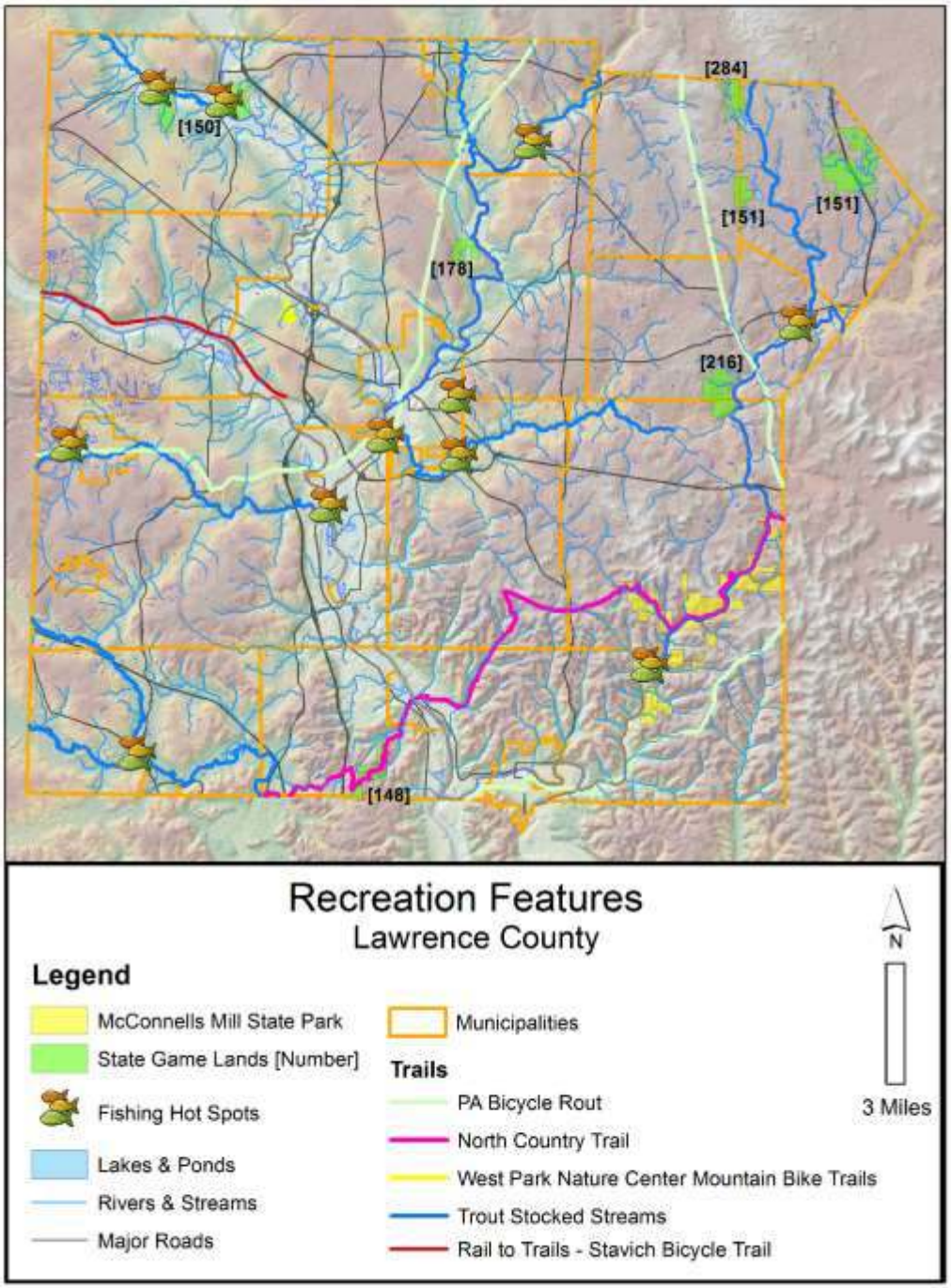
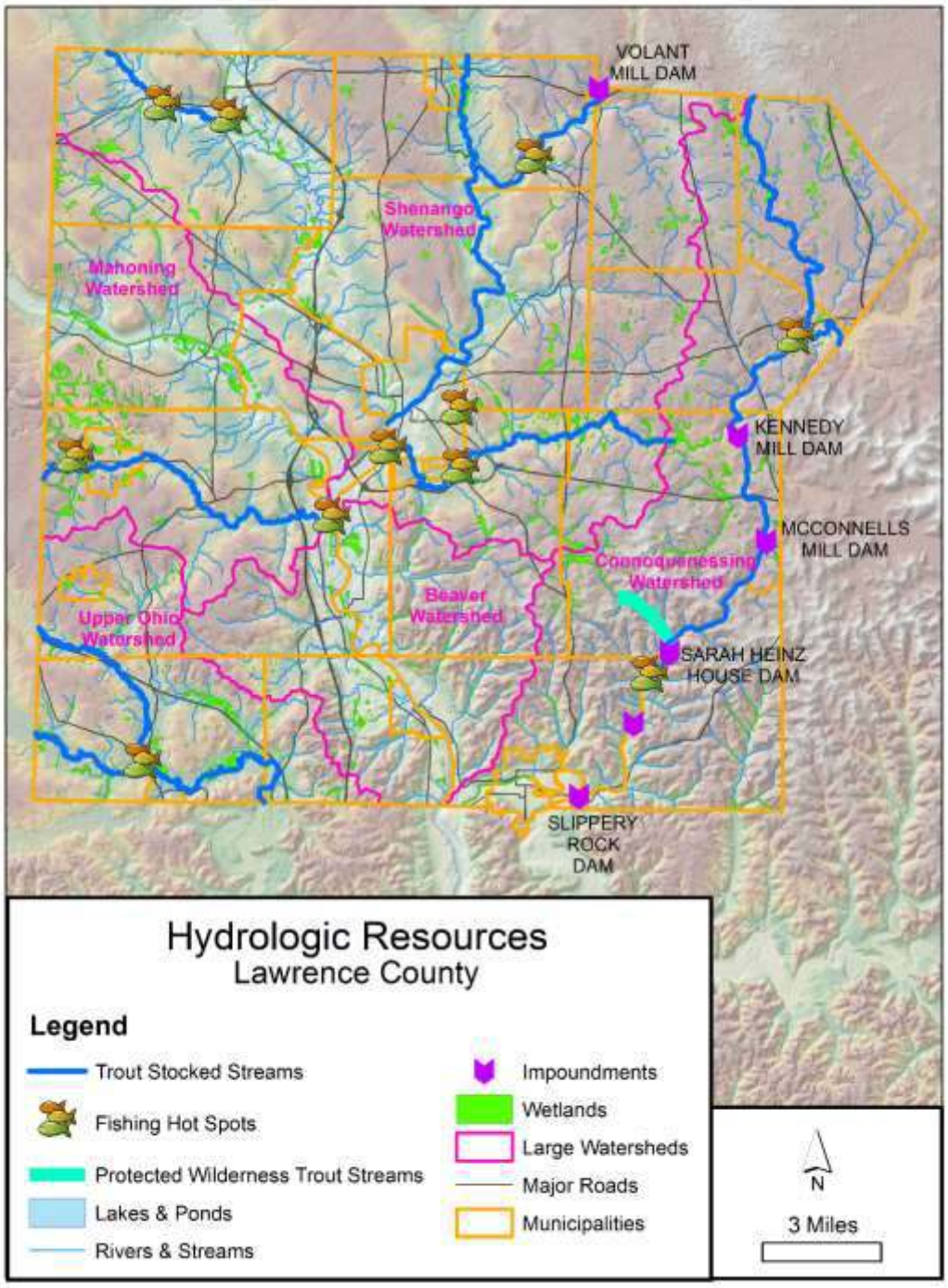


Figure 8 - Hydrologic Features



3. Planning Process

3.1. Update Process and Participation Summary

The Lawrence County Hazard Mitigation Plan update began in October 2013. The Lawrence County Commissioners were able to secure a hazard mitigation grant to start the process. The Lawrence County Department of Public Safety and the Planning Department were identified as the lead agencies for the Lawrence County Hazard Mitigation Plan Update. The planning process involved a variety of key decision makers and stakeholders within Lawrence County. Lawrence County immediately determined that the utilization of a contracted consulting agency would be necessary to assist with the plan update process. MCM Consulting Group, Inc. was selected as the contracted consulting agency to complete the update of the hazard mitigation plan. The core hazard mitigation team, which was referred to as the project team, included officials from the Lawrence County Commissioners' Office, Department of Public Safety, Planning Department, Assessment Office and MCM Consulting Group, Inc.

The process was developed around the requirements laid out in the Federal Emergency Management Agency (FEMA) Local Hazard Mitigation Crosswalk, referenced throughout this plan, as well as numerous other guidance documents including, but not limited to, Pennsylvania's All-Hazard Mitigation Standard Operating Guide, FEMA's State and Local Mitigation Planning How-to Guide series of documents (FEMA 386-series) and the National Fire Protection Association (NFPA) 1600 Standard on Disaster/Emergency Management and Business Continuity Programs.

MCM Consulting Group, Inc. (MCM) assisted the Lawrence County Planning Department in coordinating and leading public involvement meetings, local planning team meetings, analysis and the writing of the Hazard Mitigation Plan (HMP) Update. The Lawrence County Local Planning Team worked closely with MCM in the writing and review of the HMP. MCM conducted project meetings and local planning team meetings throughout the process. Meeting agendas, meeting minutes and sign in sheets were developed and maintained for each meeting conducted by MCM. These documents are detailed in Appendix C of this plan.

Public meetings with local elected officials were held, as well as work sessions and in-progress review meetings with the Lawrence County Local Planning Team and staff. At each of the public meetings, respecting the importance of local knowledge, municipal officials were strongly encouraged to submit hazard mitigation project opportunity forms, complete their respective portions of the capabilities assessment and review and eventually adopt the county hazard mitigation plan. Lawrence County will continue to work with all local municipalities to collect local hazard mitigation project opportunities.

The HMP planning process consisted of:

- Applying for and receiving a hazard mitigation planning grant (HMPG) to fund the planning project.
- Announcing the initiative via press releases and postings on the county website.
- Involving elected and appointed county and municipal officials in a series of meetings, training sessions and workshops.
- Identifying capabilities and reviewed the information with the municipalities.
- Identifying hazards.
- Assessment of risk and analyzing vulnerabilities.
- Identifying mitigation strategies, goals and objectives.
- Developing an implementation plan.
- Announcing completion via press releases and postings on the county website.
- Plan adoption at a public meeting of the Lawrence County Board of Commissioners.
- Plan submission to FEMA and PEMA.

The 2015 Lawrence County HMP was completed September 1, 2015. The 2015 plan follows an outline developed by PEMA which provides a standardized format for all local HMPs in the Commonwealth of Pennsylvania. The 2010 Lawrence County HMP format and the 2015 HMP format are consistent with the PEMA recommended format. The 2015 Lawrence County HMP has additional hazard profiles that were added to the HMP and these additional profiles increased the subsections in section 4.3 of the HMP.

3.2. The Planning Team

The 2015 Lawrence County Hazard Mitigation Plan Update was led by the Lawrence County Project Team. The Lawrence County Project Team provided guidance and leadership for the overall project. The project team assisted MCM Consulting Group, Inc. with dissemination of information and administrative tasks. *Table 3 - Project Team* outlines the individuals that comprised this team.

Table 3 - Project Team

Lawrence County Hazard Mitigation Plan Update Project Team		
Name	**Organization**	**Position**
Allen Miller	Lawrence County Planning Department	GIS Planner/Deputy Director of Planning
Amy McKinney	Lawrence County Planning Department	Director
Brian Melcer	Lawrence County Department of Public Safety	Director
Tina Marshall	Lawrence County Department of Public Safety	EMA
Edward Hoffman	MCM Consulting Group, Inc.	Senior Consultant
Michael T. Rearick	MCM Consulting Group, Inc.	Senior Consultant
Robert Anderson	MCM Consulting Group, Inc.	Senior Consultant
Valerie Zents	MCM Consulting Group, Inc.	Project Coordinator
David Haas	MCM Consulting Group, Inc.	GIS Consultant

In order to represent the county, the Lawrence County Project Team developed a diversified list of potential Local Planning Team (LPT) members. Members that participated in the 2010 hazard mitigation plan were highly encouraged to participate. The project team then provided invitations to the prospective members and provided a description of duties to serve on the LPT. The LPT worked throughout the process to plan and hold meetings, collect information and conduct public outreach.

The stakeholders listed in *Table 4 - Local Planning Team* served on the 2015 Lawrence County Hazard Mitigation Local Planning Team, actively participated in the planning process by attending meetings, completing assessments, surveys and worksheets and/or submitting comments.

Table 4 - Local Planning Team

Lawrence County Hazard Mitigation Plan Update Local Planning Team		
Name	**Organization**	**Position**
Allen Miller	Lawrence County Planning Department	GIS Planner/Deputy Director of Planning
Amy McKinney	Lawrence County Planning Department	Director
Brian Melcer	Lawrence County Department of Public Safety	Director
Dan Vogler	Lawrence County	Commissioner
Debbie Henson	Lawrence County Department of Public Safety	EMA Assistant
David Harding	Lawrence County PennDOT	
Edward Hoffman	MCM Consulting Group, Inc.	Senior Consultant
Jane Wood	Westminster College	
Jim Gagliano Jr.	Lawrence County	
JoAnn McCready	Lawrence County Conservation District	District Manager
Matt Staniszewski	City of New Castle	Director of Community and Economic Development
Michael T. Rearick	MCM Consulting Group, Inc.	Senior Consultant
Robert Anderson	MCM Consulting Group, Inc.	Senior Consultant
Stephen Schuster	Ellwood City School District	
Tina Marshall	Lawrence County Department of Public Safety	EMA

3.3. Meetings and Documentation

Several public meetings with local elected officials and the local planning team were held. At each of the public meetings, municipal officials were strongly encouraged to submit hazard mitigation project opportunity forms, complete their respective portions of the capability assessment and review and eventually adopt the multi-jurisdictional HMP. *Table 5 - HMP Process Timeline* lists the meetings held during the HMP planning process, which organizations and municipalities attended and the topic that was discussed at each meeting. All meeting agendas, sign-in sheets, presentation slides, any other documentation is located in Appendix C.

A final public meeting was held on September 1, 2015 to present the draft plan and invite public comments. The meeting was advertised in the local newspaper and also made available digitally on the Lawrence County web site at: www.co.Lawrence.pa.us.

The public comment period remained open until October 1, 2015. No public comments were submitted in writing to Allen Miller at the Lawrence County Planning Department. All information has been included in this plan in Appendix C.

Table 5 - HMP Process Timeline

Lawrence County HMP Process - Timeline		
Date	**Meeting**	**Description**
10/17/13	Lawrence County Hazard Mitigation Plan (HMP) Kick-Off Meeting	Identified challenges and opportunities as they relate to fulfilling the DMA 2000 requirements. Identified existing studies and information sources relevant to the Hazard Mitigation Plan. Identified stakeholders, including the need to involve local officials.
11/06/13	Local Planning Team Initial Meeting	Defined hazard mitigation planning and identified roles and responsibilities. Discussed the 2010 hazard mitigation plan and defined a timeline to complete the update.
06/04/14	Public Meeting	Conducted a public meeting to review the draft risk assessment section of the Lawrence County Hazard Mitigation Plan update.
09/25/14 09/26/14	Meeting with Municipal Officials	Educated county and local elected officials on the hazard mitigation planning process. Presented the findings of the hazard vulnerability analysis and risk assessment. Sought input for mitigation projects throughout the county. Distributed Hazard Mitigation Project Opportunity Forms.
09/01/15	Lawrence County Hazard Mitigation Plan – Draft Plan Review Public Meeting	An update of the hazard mitigation planning process was delivered. The Draft HMP was reviewed with the municipal representatives and public. Attendees were informed about the timeline and their opportunity to review the entire draft plan and provide written comments for inclusion into the plan.

3.4. Public and Stakeholder Participation

Lawrence County engaged numerous stakeholders and encouraged public participation during the HMP update process. Advertisements for public meetings were completed utilizing the local newspaper and the Lawrence County website. Copies of those advertisements are located in Appendix C. Municipalities and other county entities were invited to participate in various meetings and encouraged to review and update various worksheets and surveys. Copies of all meeting agendas, meeting minutes and sign-in sheets are located in Appendix C. Worksheets and surveys completed by the municipalities and other stakeholders are located in appendices of this plan update as well. Municipalities were also encouraged to review hazard mitigation related items with other constituents located in the municipality like businesses, academia, private and non-profit interests.

The tools listed below were distributed with meeting invitations, provided directly to municipalities to complete and return to the Lawrence County Planning Department or at meetings to solicit information, data and comments from both local municipalities

and other key stakeholders. Responses to these worksheets and surveys are available for review at the Planning Department.

1. **Risk Assessment Hazard Identification and Risk Evaluation Worksheet:** Capitalizes on local knowledge to evaluate the change in the frequency of occurrence, magnitude of impact and/or geographic extent of existing hazards and allows communities to evaluate hazards not previously profiled using the Pennsylvania Standard List of Hazards.
2. **Capability Assessment Survey:** Collects information on local planning, regulatory, administrative, technical, fiscal and political capabilities that can be included in the countywide mitigation strategy.
3. **Municipal Project Opportunity Forms and Mitigation Actions:** Copies of the 2010 mitigation opportunity forms that were included in the current HMP were provided to the municipalities for review and amendment. These opportunities are located in Appendix F. The previous mitigation actions were provided and reviewed at update meetings. New 2015 municipal project opportunity forms are included as well, located in Appendix G**.**

A schedule that provided appropriate opportunities for public comment was utilized during the review and drafting process. Any public comment that was received during public meetings or during the draft review of the plan were documented and included in the plan. Copies of newspaper public meeting notices, website posted public notices and other correspondence are included in Appendix C of this plan.

Lawrence County invited all contiguous counties to review the 2015 draft hazard mitigation plan. A letter was sent to the emergency management coordinator in Beaver, Butler and Mercer Counties on September 1, 2015. Copies of these letters are included in Appendix C.

3.5. Multi-Jurisdictional Planning

Lawrence County used an open, public process to prepare this HMP. Meetings and letters to municipal officials were conducted to inform and educate them about hazard mitigation planning and its local requirements. 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. The pinnacle to the municipal involvement process was the adoption of the final plan. *Table 6 - Worksheets, Surveys and Forms Participation* reflects the municipality participation by completing worksheets, surveys and forms.

Table 6 - Worksheets, Surveys and Forms Participation

Municipality Participation in Worksheets, Surveys and Forms			
Municipality	**Capability Assessment Survey**	**Risk Assessment Hazard Identification and Risk Evaluation Worksheet**	**Hazard Mitigation Opportunity Form Review and Updates**
City of New Castle	x	x	x
Bessemer Borough			
Ellport Borough	x	x	x
Ellwood City Borough			
Enon Valley Borough			x
Hickory Township		x	
Little Beaver Township			
Mahoning Township			
Neshannock Township	x	x	x
New Beaver Borough			x
New Wilmington Borough			x
North Beaver Township			
Perry Township	x	x	x
Plain Grove Township			
Pulaski Township	x	x	x
S.N.P.J. Borough			
Scott Township			
Shenango Township			x
Slippery Rock Township			
So. New Castle Borough			
Taylor Township			
Union Township	x	x	x
Volant Borough			
Wampum Borough	x		x
Washington Township			
Wayne Township	x	x	x
Wilmington Township			x

21 of 27 municipalities within Lawrence County have adopted the 2010 Lawrence County Hazard Mitigation Plan as the municipal hazard mitigation plan. The Lawrence County Local Planning Team goal is 100% participation by municipalities in adopting the 2015 Lawrence County Hazard Mitigation Plan Update.

3.6. Existing Planning Mechanisms

There are numerous existing regulatory and planning mechanisms in place at the state, county and municipal level of government which support hazard mitigation planning efforts. These tools include the 2013 Commonwealth of Pennsylvania Standard All-Hazard Mitigation Plan, local floodplain management ordinances, the Lawrence County Comprehensive Plan, Lawrence County Emergency Operations Plan, local emergency

operation plans, local zoning ordinances, local subdivision and land development ordinances and the Lawrence County Stormwater Management Ordinance.

Information from several of these documents has been incorporated into this plan and mitigation actions have been developed to further integrate these planning mechanisms into the hazard mitigation planning process. In particular, information on identified development constraints and potential future growth areas was incorporated from the Lawrence County Comprehensive Plan so that vulnerability pertaining to future development could be established. Floodplain management ordinance information was used to aid in the establishment of local capabilities in addition to participation in the national flood insurance program (NFIP).

4. Risk Assessment

4.1. Update Process Summary

A key component to reducing future losses is to first have a clear understanding of what the current risks are and what steps may be taken to lessen their threat. The development of the risk assessment is the critical first step in the entire mitigation process, as it is an organized and coordinated way of assessing potential hazards and risks. The risk assessment identifies the effects of both natural and manmade hazards and describes each hazard in terms of its frequency, severity and county impact. Numerous hazards were identified as part of the process.

A risk assessment evaluates threats associated with a specific hazard and is defined by probability and frequency of occurrence, magnitude, severity, exposure and consequences. The Lawrence County risk assessment provides in-depth knowledge of the hazards and vulnerabilities that affect Lawrence 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.

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

The Lawrence County risk assessment is not a static document, but rather, is a biennial review requiring periodic updates. Potential future hazards include changing technology, new facilities and infrastructure, dynamic development patterns and demographic and socioeconomic changes into or out of hazard areas. By contrast, old hazards, such as brownfields and landfills, may pose new threats as county conditions evolve.

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 impact on traffic patterns, population density and distribution, storm water runoff and other related factors. Therefore, limiting the risk assessment to past events is myopic and inadequate.

The Lawrence County Local Planning Team reviewed and assessed the change in risk for all natural and manmade hazards identified in the 2010 hazard mitigation plan. The mitigation planning team then identified hazards that were outlined within the Pennsylvania Hazard Mitigation Plan but not included in the 2010 Lawrence County Hazard

Mitigation Plan that could impact Lawrence County. The team utilized the Hazard Identification and Risk Evaluation worksheet that was provided by the Pennsylvania Emergency Management Agency.

The Lawrence County Project Team met with municipalities and provided guidance on how to complete the municipal hazard identification and risk evaluation worksheet. Seven (7) municipalities returned a completed worksheet. This information was combined with the county information to develop an overall list of hazards that would need to be profiled.

Once the natural and man-made hazards were identified and profiled, the local planning team then completed a vulnerability assessment for each hazard. An inventory of vulnerable assets was completed utilizing GIS data and local planning team knowledge. The team used the most recent Lawrence County assessment data to estimate loss to particular hazards. Risk Factor was then assessed to each profiled hazard utilizing the hazard prioritization matrix. This assessment allows the county and its municipalities to focus on and prioritize local mitigation efforts on areas that are most likely to be damaged or require early response to a hazard event.

4.2. Hazard Identification

4.2.1. Presidential and Gubernatorial Disaster Declarations

Table 7 - Presidential & Gubernatorial Disaster Declarations presents a list of all Presidential and Governor's Disaster Declarations that have affected Lawrence County from 1972 through 2014, according to the Pennsylvania Emergency Management Agency.

Table 7 - Presidential & Gubernatorial Disaster Declarations

Presidential Disaster Declarations and Gubernatorial Declarations and Proclamations		
Date	**Hazard Event**	**Action**
June 1972	Flood Hurricane Agnes	President's Declaration Of Major Disaster - Governor's Proclamation
January 1978	Heavy Snow	Governor's Proclamation
February 1978	Blizzard	Governor's Proclamation
March 1993	Blizzard	Governor's Proclamation & President's Declaration of Emergency
January 1994	Severe Winter Storm	Governor's Proclamation & President's Declaration Of Major Disaster
January 1996	Severe Winter Storm	Governor's Proclamation & President's Declaration Of Major Disaster for Individual Assistance
September 1999	Hurricane Floyd	Governor's Proclamation & President's Declaration Of Major Disaster
August 2003	High Winds and Heavy Rains	Presidential - Major Disaster
September 2003	Hurricane Isabel/Henri	Governor's Proclamation of Disaster Emergency; Presidential Declaration

Presidential Disaster Declarations and Gubernatorial Declarations and Proclamations		
Date	**Hazard Event**	**Action**
September 2004	Tropical Depression Frances	Financial Assistance to Help Families and Communities Recover
September 2004	Tropical Depression Ivan	Financial Assistance to Help Families and Communities Recover
September 2005	Proclamation of Emergency – Hurricane Katrina	Emergency declaration. Proclamation of Emergency to render mutual aid and to receive and house evacuees
September 2006	Proclamation of Emergency – Tropical Depression Ernesto	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
February 2007	Proclamation of Emergency – Regulations	Proclamation of Emergency to waive the regulations regarding hours of service limitations for drivers of commercial vehicles
February 2007	Proclamation of Emergency – Severe Winter Storm	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
April 2007	Severe Storm	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to supplement county and municipal efforts
February 2010	Proclamation of Emergency – Severe Winter Storm	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to supplement county and municipal efforts
January 2011	Proclamation of Emergency – Severe Winter Storm	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
August 2011	Proclamation of Emergency – Severe Storms and Flooding (Lee/Irene)	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
April 2012	Proclamation of Emergency – Spring Winter Storms	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
October 2012	Proclamation of Emergency – Hurricane Sandy	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation; to provide $5 Million in funds to PEMA for disaster related expenses
January 2013	Hurricane Sandy	Presidential Disaster Declaration
October 2013	Severe Storms, Tornado and Flooding	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation
January 2014	Severe Cold Weather	Proclamation of Propane and Heating Oil Emergency
February 2014	Severe Winter Storm	Proclamation of Emergency to utilize all available resources and personnel as is deemed necessary to cope with the magnitude and severity of this emergency situation

Source: Pennsylvania Emergency Management Agency and Federal Emergency Management Agency

4.2.2. Summary of Hazards

The Lawrence County Local Planning Team (LPT) was provided the Pennsylvania Standard List of Hazards to be considered for evaluation in the 2015 HMP Update. Following a review of the hazards considered in the 2010 HMP and the standard list of hazards, the Local Planning Team decided that the 2015 plan should identify, profile and analyze twenty three (23) hazards. These 23 hazards include all of the hazards profiled in the 2010 plan. The list below contains the 23 hazards that have the potential to impact Lawrence County as identified through previous risk assessments, the Lawrence County Hazards Vulnerability Analysis and input from those that participated in the 2015 HMP update. Hazard profiles are included in Section 4.3 for each of these hazards.

Identified Natural Hazards

Drought

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds and low relative humidity can exacerbate the severity of drought. This hazard is of particular concern in Pennsylvania due to the presence of farms as well as water-dependent industries and recreation areas across the Commonwealth. A prolonged drought could severely impact these sectors of the local economy, as well as residents who depend on wells for drinking water and other personal uses. (National Drought Mitigation Center, 2006).

Earthquake

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of underground caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons and disrupt the social and economic functioning of the affected area. Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking which is dependent upon amplitude and duration of the earthquake. (FEMA, 1997).

Extreme Temperatures

Extreme cold temperatures drop well below what is considered normal for an area during the winter months and often accompany winter storm events. Combined with increases in wind speed, such temperatures in Pennsylvania can be life threatening to

those exposed for extended periods of time. Extreme heat can be described as temperatures that hover 10°F or more above the average high temperature for a region during the summer months. Extreme heat is responsible for more deaths in Pennsylvania than all other natural disasters combined (PA HMP, 2004).

Flood, Flash Flood, Ice Jam

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period of time. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces. The severity of a flood event is dependent upon a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, present soil moisture conditions, the degree of vegetative clearing as well as the presence of impervious surfaces in and around flood-prone areas. (NOAA, 2009). Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams. All forms of flooding can damage infrastructure (USACE, 2007).

Hurricanes, Tropical Storms

Hurricanes, tropical storms and nor'easters are classified as cyclones and are any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise (in the Northern Hemisphere) and whose diameter averages 10-30 miles across. While most of Pennsylvania is not directly affected by the devastating impacts cyclonic systems can have on coastal regions, many areas in the state are subject to the primary damaging forces associated with these storms including high-level sustained winds, heavy precipitation and tornados. Areas in southeastern Pennsylvania could be susceptible to storm surge and tidal flooding. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico during the official Atlantic hurricane season (June through November). (FEMA, 1997).

Invasive Species

An invasive species is a species that is not indigenous to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. These species can be any type of organism: plant, fish, invertebrate, mammal, bird, disease, or pathogen. Infestations may not necessarily impact human health, but can create a nuisance or agricultural hardships by destroying

crops, defoliating populations of native plant and tree species, or interfering with ecological systems (Governor's Invasive Species Council of Pennsylvania, 2009).

Landslide

A landslide is the downward and outward movement of slope-forming soil, rock and vegetation reacting to the force of gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes and changes in groundwater levels. Mudflows, mudslides, rock falls, rockslides and rock topples are all forms of a landslide. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed hillsides and areas recently burned by forest and brush fires. (Delano & Wilshusen, 2001).

Lightning Strikes

Lightning is a discharge of electrical energy resulting from the build-up of positive and negative charges within a thunderstorm. The flash or "bolt" of light usually occurs within clouds or between clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000°F. On average, 89 people are killed each year by lightning strikes in the United States. Within Pennsylvania, the annual average number of thunder and lightning events in a given area can expect ranges between 40-70 events per year (FEMA, 1997).

Pandemic and Infectious Diseases

A pandemic occurs when infection from of a new strain of a certain disease, to which most humans have no immunity, substantially exceeds the number of expected cases over a given period of time. Such a disease may or may not be transferable between humans and animals. (Martin & Martin-Granel, 2006).

Radon Exposure

Radon is a cancer-causing natural radioactive gas that you can't see, smell, or taste. It is a large component of the natural radiation that humans are exposed to and can pose a serious threat to public health when it accumulates in poorly ventilated residential and occupation settings. According to the USEPA, radon is estimated to cause about 21,000 lung cancer deaths per year, second only to smoking as the leading cause of lung cancer (EPA 402-R-03-003: EPA Assessment…, 2003). An estimated 40% of the homes in Pennsylvania are believed to have elevated radon levels (Pennsylvania Department of Environmental Protection, 2009).

Tornado, Wind Storm

A wind storm can occur during severe thunderstorms, winter storms, coastal storms, or tornados. Straight-line winds such as a downburst have the potential to cause wind gusts that exceed 100 miles per hour. Based on 40 years of tornado history and over 100 years of hurricane history, FEMA identifies western and central Pennsylvania as being more susceptible to higher winds than eastern Pennsylvania. (FEMA, 1997). A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornados are most often generated by thunderstorm activity (but sometimes result from hurricanes or tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of high wind velocities and wind-blown debris. According to the National Weather Service, tornado wind speeds can range between 30 to more than 300 miles per hour. They are more likely to occur during the spring and early summer months of March through June and are most likely to form in the late afternoon and early evening. Most tornados are a few dozen yards wide and touch down briefly, but even small, short-lived tornados can inflict tremendous damage. Destruction ranges from minor to catastrophic depending on the intensity, size and duration of the storm. Structures made of light materials such as mobile homes are most susceptible to damage. Waterspouts are weak tornados that form over warm water and are relatively uncommon in Pennsylvania. Each year, an average of over 800 tornados is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries (NOAA, 2002). Based on NOAA Storm Prediction Center Statistics, the number of recorded F3, F4, & F5 tornados between 1950-1998 ranges from <1 to 15 per 3,700 square mile area across Pennsylvania (FEMA, 2009). A water spout is a tornado over a body of water (American Meteorological Society, 2009).

Wildfire

A wildfire is a raging, uncontrolled fire that spreads rapidly through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. Wildfires can occur at any time of the year, but mostly occur during long, dry hot spells. Any small fire in a wooded area, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Wildfires in Pennsylvania can occur in fields, grass, brush and forests. 98% of wildfires in Pennsylvania are a direct result of people, often caused by debris burns (PA DCNR, 1999).

Winter Storm

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility and disrupt transportation. The Commonwealth of Pennsylvania has a long history of severe winter weather. (NOAA, 2009).

Identified Manmade Hazards

Civil Disturbance

Civil disturbance hazards encompass a set of hazards emanating from a wide range of possible events that cause civil disorder, confusion, strife and economic hardship. Civil disturbance hazards include the following:

- Famine; involving a widespread scarcity of food leading to malnutrition and increased mortality (Robson, 1981).
- Economic Collapse, Recession; Very slow or negative growth, for example (Economist, 2009).
- Misinformation; erroneous information spread unintentionally (Makkai, 1970).
- Civil Disturbance, Public Unrest, Mass Hysteria, Riot; group acts of violence against property and individuals, for example (18 U.S.C. § 232, 2008).
- Strike, Labor Dispute; controversies related to the terms and conditions of employment, for example (29 U.S.C. § 113, 2008).

Dam Failure

A dam is a barrier across flowing water that obstructs, directs, or slows down water flow. Dams provide benefits such as flood protection, power generation, drinking water, irrigation and recreation. Failure of these structures results in an uncontrolled release of impounded water. Failures are relatively rare, but immense damage and loss of life is possible in downstream communities when such events occur. Aging infrastructure, hydrologic, hydraulic and geologic characteristics, population growth and design and maintenance practices should be considered when assessing dam failure hazards. The failure of the South Fork Dam, located in Johnstown, Pennsylvania, was the deadliest dam failure ever experienced in the United States. It took place in 1889 and resulted in the Johnstown Flood which claimed 2,209 lives (FEMA, 1997). Today there are approximately 3,200 dams and reservoirs throughout Pennsylvania (Pennsylvania Department of Environmental Protection, 2009).

Disorientation

Large numbers of people are attracted to Pennsylvania's rural areas for recreational purposes such as hiking, camping, hunting and fishing. As a result, people can become

lost or trapped in remote and rugged wilderness areas. Search and rescue may be required for people who suffer from medical problems or injuries and those who become accidentally or intentionally disoriented. Search and rescue efforts are focused in and around state forest and state park lands (DCNR, 2009).

Drowning

Drowning is death from suffocation, typically associated with swimming, fishing, boating or bridge accidents, or suicide. It can be a significant hazard in communities with numerous residential pools or water bodies (e.g. ponds, lakes, rivers, etc.) and extensive outdoor recreational activity. Drowning rates are particularly high for children ages 1-14. The Centers for Disease Control and Prevention estimates that drowning is the second leading cause of injury death (after motor vehicle crashes) among children ages 1-14. (CDC, 2008).

Environmental Hazards

Environmental hazards are hazards that pose threats to the natural environment, the built environment and public safety through the diffusion of harmful substances, materials, or products. Environmental hazards include the following:

- Hazardous material releases; at fixed facilities or as such materials are in transit and including toxic chemicals, infectious substances, biohazardous waste and any materials that are explosive, corrosive, flammable, or radioactive (PL 1990-165, § 207(e)).
- Air or Water Pollution; the release of harmful chemical and waste materials into water bodies or the atmosphere, for example (National Institute of Health Sciences, July 2009; Environmental Protection Agency, Natural Disaster PSAs, 2009).
- Superfund Facilities; hazards originating from abandoned hazardous waste sites listed on the National Priorities List (Environmental Protection Agency, National Priorities List, 2009).
- Manure Spills; involving the release of stored or transported agricultural waste, for example (Environmental Protection Agency, Environmental Impacts of…, 1998).
- Product Defect or Contamination; highly flammable or otherwise unsafe consumer products and dangerous foods (Consumer Product Safety Commission, 2003).

Nuclear Incidents

Nuclear accidents generally refer to events involving the release of significant levels of radioactivity or exposure of workers or the general public to radiation (FEMA, 1997). Nuclear accidents/incidents can be placed into three categories: 1) Criticality accidents which involve loss of control of nuclear assemblies or power reactors, 2) Loss-of-coolant

accidents which result whenever a reactor coolant system experiences a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating make-up system, and 3) Loss-of-containment accidents which involve the release of radioactivity. The primary concern following such an incident or accident is the extent of radiation, inhalation, and ingestion of radioactive isotopes which can cause acute health effects (e.g. death, burns, severe impairment), chronic health effects (e.g. cancer), and psychological effects. (FEMA, 1997).

Terrorism

Terrorism is use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons. (FEMA, 2009).

Transportation Accidents

Transportation accidents can result from any form of air, rail, water, or road travel. It is unlikely that small accidents would significantly impact the larger community. However, certain accidents could have secondary regional impacts such as a hazardous materials release or disruption in critical supply/access routes, especially if vital transportation corridors or junctions are present. (Research and Innovative Technology Administration, 2009). Traffic congestion in certain circumstances can also be hazardous. Traffic congestion is a condition that occurs when traffic demand approaches or exceeds the available capacity of the road network. This hazard should be carefully evaluated during emergency planning since it is a key factor in timely disaster or hazard response, especially in areas with high population density. (Federal Highway Administration, 2009).

Urban Fire and Explosion

An urban fire involves a structure or property within an urban or developed area. For hazard mitigation purposes, major urban fires involving large buildings and/or multiple properties are of primary concern. The effects of a major urban fire include minor to significant property damage, loss of life, and residential or business displacement. Explosions are extremely rapid releases of energy that usually generate high temperatures and often lead to fires. The risk of severe explosions can be reduced through careful management of flammable and explosive hazardous materials. (FEMA, 1997).

Utility Interruption

Utility interruption hazards are hazards that impair the functioning of important utilities in the energy, telecommunications and public works and information network sectors. Utility interruption hazards include the following:

- Geomagnetic Storms; including temporary disturbances of the Earth's magnetic field resulting in disruptions of communication, navigation and satellite systems (National Research Council et al., 1986).
- Fuel or Resource Shortage; resulting from supply chain breaks or secondary to other hazard events, for example (Mercer County, PA, 2005).
- Electromagnetic Pulse; originating from an explosion or fluctuating magnetic field and causing damaging current surges in electrical and electronic systems (Institute for Telecommunications Sciences, 1996).
- Information Technology Failure; due to software bugs, viruses, or improper use (Rainer Jr., et al, 1991).
- Ancillary Support Equipment; electrical generating, transmission, system-control and distribution-system equipment for the energy industry (Hirst & Kirby, 1996).
- Public Works Failure; damage to or failure of highways, flood control systems, deep-water ports and harbors, public buildings, bridges, dams, for example (United States Senate Committee on Environment and Public Works, 2009).
- Telecommunications System Failure; Damage to data transfer, communications and processing equipment, for example (FEMA, 1997)
- Transmission Facility or Linear Utility Accident; liquefied natural gas leakages, explosions, facility problems, for example (United States Department of Energy, 2005)
- Major Energy, Power, Utility Failure; interruptions of generation and distribution, power outages, for example (United States Department of Energy, 2000).

4.3. Hazard Profiles

4.3.1. Drought

4.3.1.1 Location and Extent

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds and low relative humidity can exacerbate the severity of drought. This hazard is of particular concern in Pennsylvania due to the presence of farms as well as water-dependent industries and recreation areas across the Commonwealth. A prolonged drought could severely impact these sectors of the local economy, as well as residents who depend on wells for drinking water and other personal uses. (National Drought Mitigation Center, 2006).

There are two types of droughts that will be addressed; hydrologic and water management (as categorized by the World Meteorological Organization). A hydrologic drought is defined in terms of reduction of stream flows, reduction in lake or reservoir storage and lowering of groundwater levels. A water management drought is characterized as water deficiencies that exist due to failure of water management practices or facilities to bridge normal or abnormal dry periods and equalized water supply throughout the year. Pennsylvania has faced and will continue to face both types of droughts in the future.

A hydrologic drought results when there is a shift in normal weather patterns over an area causing the amount of precipitation to fall significantly below the long-termed average. A water management drought results not from a reduction in supply, but a disparity in supply versus demand. Poor water management practices and/or community planning generally cause this.

4.3.1.2 Range of Magnitude

The Commonwealth uses five parameters to assess drought conditions:

- Stream flows (compared to benchmark records);
- Precipitation (measured as the departure from normal, 30 year average precipitation);
- Reservoir storage levels in a variety of locations (especially three New York City reservoirs in Upper Delaware River Basin);
- Groundwater elevations in a number of counties (comparing to past month, past year and historic record); and
- The Palmer Drought Index (See *Table 8 - Palmer Drought Severity Index*), a measure of soil moisture computed by the National Weather Service.

Table 8 - Palmer Drought Severity Index

Palmer Drought Severity Index (PDSI) Classifications	
SEVERITY CATEGORY	
Extremely wet	4.0 or more
Very wet	3.0 to 3.99
Moderately wet	2.0 to 2.99
Slightly wet	1.0 to 1.99
Incipient wet spell	0.5 to 0.99
Near normal	0.49 to -0.49
Incipient dry spell	-0.5 to -0.99
Mild drought	-1.0 to -1.99
Moderate drought	-2.0 to -2.99
Severe drought	-3.0 to -3.99
Extreme drought	-4.0 or less

Table 9 - Drought Preparation Phases

Drought Preparation Phases				
	General Activity	**Actions**	**Request**	**Goal**
Drought Watch	Early stages of planning and alert for drought possibility	Increased water monitoring, awareness and preparation for response among government agencies, public water suppliers, water users and the public	Voluntary water conservation	Reduce water use by 5%
Drought Warning	Coordinate a response to imminent drought conditions and potential water shortages	Reduce shortages, relieve stressed sources, develop new sources if needed	Continue voluntary water conservation, impose mandatory water use restrictions if needed	Reduce water use by 10-15%
Drought Emergency	Management of operations to regulate all available resources and respond to emergency	Support essential and high priority water uses and avoid unnecessary uses	Possible restrictions on all nonessential water uses	Reduce water use by 15%

Source: PA Department of Environmental Protection

Local Water Rationing: Although not a drought phase, local municipalities may, with the approval of the PA Emergency Management Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply in designated water supply service areas. These individual water rationing plans, authorized through provisions of 4 PA Code Chapter 120, will require specific limits on individual water consumption

to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing, procedures are provided for granting of variances to consider individual hardships and economic dislocations. [Source: PEMA, 409 Plan]

Environmental impacts of drought include:

- Hydrologic effects – lower water levels in reservoirs, lakes and ponds; reduced streamflow; loss of wetlands; estuarine impacts; groundwater depletion and land subsidence; effects on water quality such as increases in salt concentration and water temperature
- Damage to animal species – lack of feed and drinking water; disease; loss of biodiversity; migration or concentration; and reduction and degradation of fish and wildlife habitat
- Damage to plant communities – loss of biodiversity; loss of trees from urban landscapes and wooded conservation areas
- Increased number and severity of fires
- Reduced soil quality
- Air quality effects – dust and pollutants
- Loss of quality in landscape

Historically, some crop losses due to drought have occurred in Lawrence County several times in the last 25 years; the worst case scenario would be a protracted drought that impacted all commercial crop production as well as livestock losses due to deficient water supplies.

4.3.1.3 Past Occurrence

Lawrence County has most recently experienced drought emergencies and water supply deficiencies during the droughts of 1998 and 2002, which resulted in a Governor's Declaration.

Drought conditions would impact land covering Lawrence County. The potential for wildfire would increase dramatically during extended drought conditions. Lawrence County experienced a major drought in 1988. The Soil Conservation Service responded to any inquires by area farmers concerning deficient water supplies for livestock. Federal assistance for loss of crops in the county received in the form of drought disaster payments totaled $222,506. These payments were divided between losses for corn, hay and other vegetables. 1,901,247 pounds of emergency feed worth $69,093 was given to farmers who had losses of 40% or more of their normal crops. Farmers continued to suffer the effects of drought in 1989, where $75,851 was distributed for crop losses. Vegetables, oats, rye, soybeans and corn were lost due to drought. In 1990, only $502 dollars were distributed for buckwheat and corn losses. In 1991, $64,598 was disbursed for crop losses. These conditions continued into 1992, where $53,389 was given to Lawrence County farmers due to crop losses. Drought conditions in 1993 brought $113,963

worth of federal aid to Lawrence County. In 2000, $23,182 in federal assistance was distributed to farmers in Lawrence County due to crop losses stemming from drought.

4.3.1.4 Future Occurrence

It would be very difficult to forecast the future frequency and severity of drought emergencies in Lawrence County. However, a drought situation could cause major shortages in private and public water supplies and crop damage on an extensive basis.

4.3.1.5 Vulnerability Assessment

Although difficult to combat a drought, they may be made less threatening if all municipalities in the county utilize proper land use development controls (building restrictions on watershed areas, etc.), erosion controls, enforce irrigation regulations, plan for emergency conservation and if possible, locate alternate sources of water.

Also, expansion of current municipal water service areas would provide more opportunity for spring/well reliant residents to secure a dependable water source but may remain impractical due to the dispersal of housing habitations, rugged terrain and prohibitive costs.

Worst case scenario would be a drought across the county affecting all water resources and during the growing season. Droughts can have adverse effects on farms and other water-dependent industries. This can result in a local economic loss. The size of animal herd operations and the number of farms per municipality was not available for this mitigation plan update. Agricultural land use vulnerability is outlined in Figure 10 below. From a societal perspective, public safety is an issue in terms of consumable water not being available, as well as water for fire protection and emergency services.

Public water service is not available in portions of Lawrence County and not available to all residents of the county (See Figure 9 Below). Most areas rely on private domestic wells. Residents or water authorities that use private domestic wells are more vulnerable to droughts because their drinking water can literally dry up. *Table 10 - Domestic Wells* shows the number of domestic wells per municipality; there are a total of 4,076 domestic wells in the county. It is important to note that the well data was obtained from the Pennsylvania Groundwater Information System (PaGWIS). PaGWIS relies on voluntary submissions of well record data by well drillers; as a result, it is not a complete database of all domestic wells in the county. This is the most complete dataset of domestic wells available.

Table 10 - Domestic Wells

Domestic Wells Per Municipality in Lawrence County	
MUNICIPALITY	**DOMESTIC WELLS**
City of New Castle	134
Bessemer Borough	12
Ellport Borough	0
Ellwood City Borough	11
Enon Valley Borough	13
New Beaver Borough	151
New Wilmington Borough	32
S.N.P.J. Borough	1
South New Castle Borough	0
Volant Borough	6
Wampum Borough	10
Hickory Township	214
Little Beaver Township	195
Mahoning Township	216
Neshannock Township	237
North Beaver Township	478
Perry Township	126
Plain Grove Township	133
Pulaski Township	327
Scott Township	274
Shenango Township	406
Slippery Rock Township	385
Taylor Township	17
Union Township	94
Washington Township	109
Wayne Township	248
Wilmington Township	247
TOTAL	**4,076**

Source: Pennsylvania Groundwater Information System

Figure 9 - Public Water Supplier Service Areas

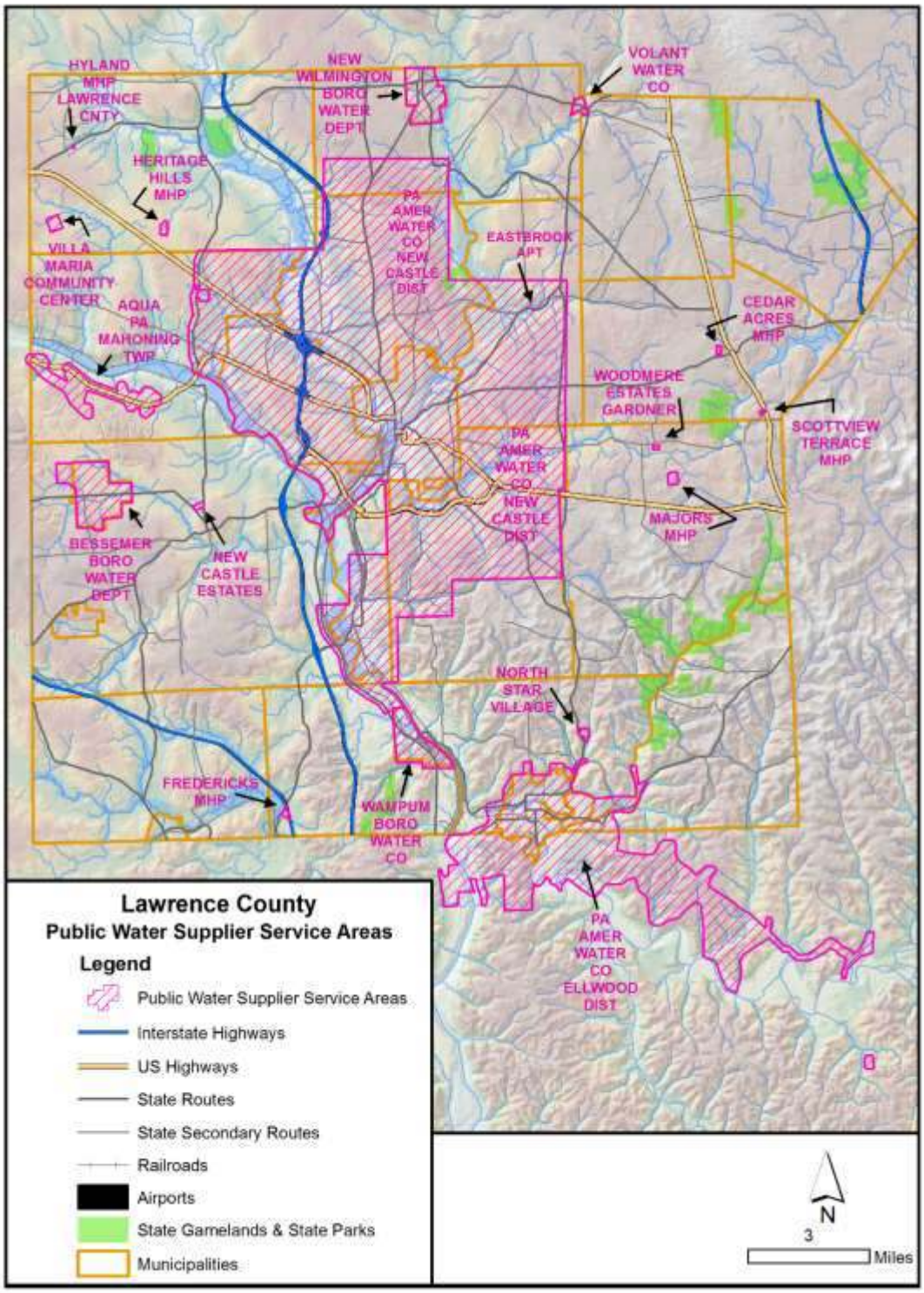
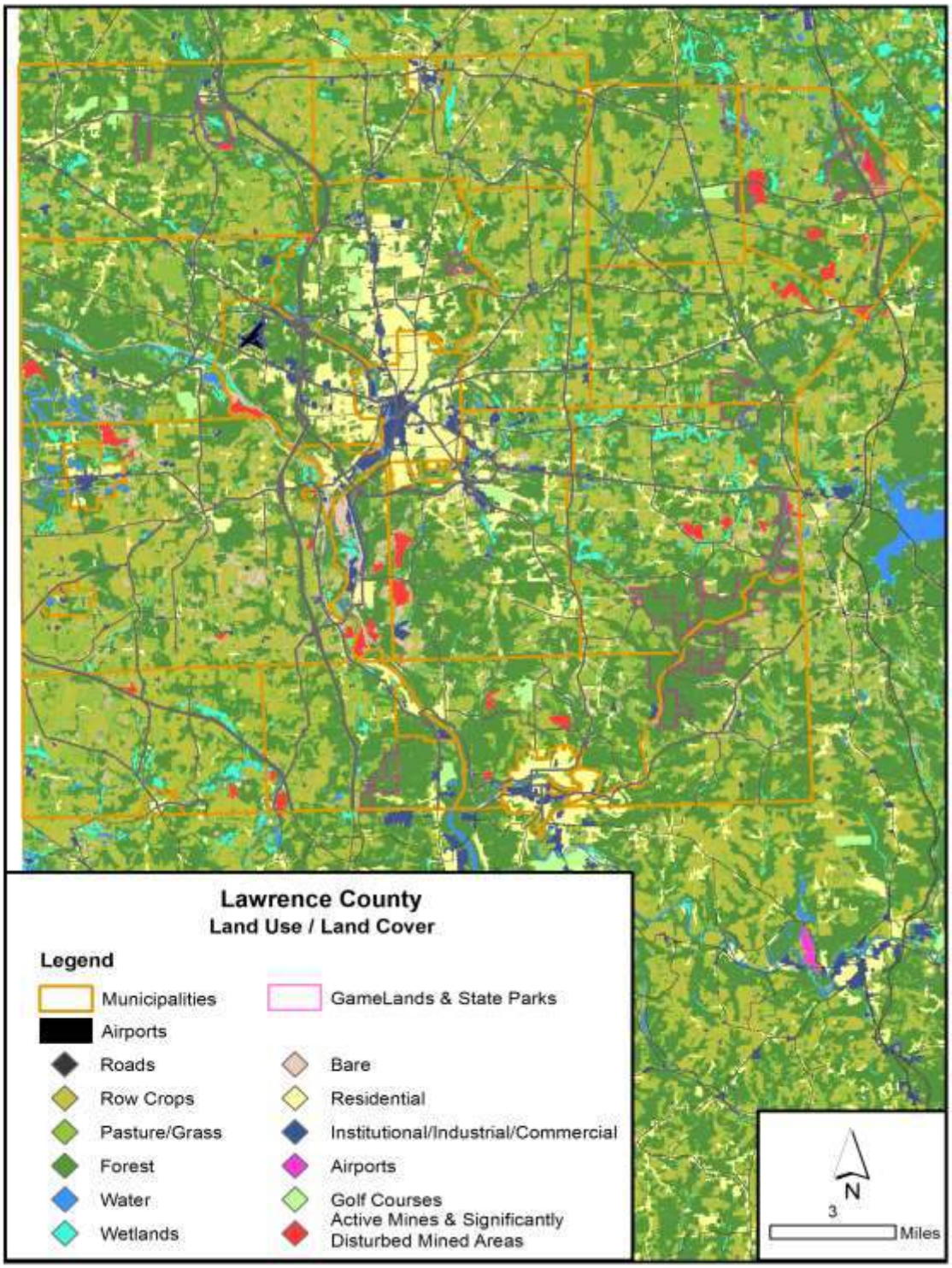


Figure 10 - Lawrence County Agricultural Areas



4.3.2. Earthquake

4.3.2.1 Location and Extent

Earthquakes are geological events that involve movement or shaking of the crust of the earth. Earthquakes are measured in terms of their magnitude and intensity (instrumental – catastrophic). Earthquakes can cause devastating destruction to the manmade environment.

Earthquakes are relatively infrequent and uncommon in Lawrence County but there is existing data to indicate that earthquake activity has occurred in Lawrence County but causing minimal damage, if any.

West Central Pennsylvania's vulnerability to earthquakes decreases from west to east. The effects of an earthquake (if the hazard exists) could potentially be anything from detected only on seismographs to ground water wells collapsing to total destruction, trees falling, ground rises and falls in waves.

4.3.2.2 Range of Magnitude

Earthquakes are caused by a sudden slip of a fault caused by the dynamic pressure of the earth's plates pushing together on both sides of the fault over time. The strength of an earthquake is determined by the size of the slip and how close the slip occurred to the surface. The most active faults are along the Pacific Coast, although some smaller, less active faults exist in the Eastern United States. The Richter scale describes the magnitude of an earthquake and can be seen below in *Table 11 - Richter Scale*.

Table 11 - Richter Scale

Richter Scale Magnitudes and Associated Earthquake Size Effects.	
RICHTER MAGNITUDES	**EARTHQUAKE EFFECTS**
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	At most, slight damage to well-designed buildings; can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas where people live up to about 100 kilometers across.
7.0-7.9	Major earthquake; can cause serious damage over large areas.
8.0 or greater	Great earthquake; can cause serious damage in areas several hundred kilometers across.

Seismic waves are the vibrations from earthquakes that travel through the earth; they are recorded on instruments called seismographs. Seismographs record a zigzag trace

that shows the varying amplitude of ground oscillations beneath the instrument. Sensitive seismographs, which greatly magnify these ground motions, can detect strong earthquakes from sources anywhere in the world. The time, locations and magnitude of an earthquake can be determined from the data recorded by seismograph stations.

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

At first, the Richter scale could be applied only to the records from instruments of identical manufacture. Now, instruments are carefully calibrated with respect to each other. Thus, magnitude can be computed from the record of any calibrated seismograph.

Earthquakes with magnitude of about 2.0 or less are usually called micro-earthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. Events with magnitudes of about 4.5 or greater - there are several thousand such shocks annually - are strong enough to be recorded by sensitive seismographs all over the world. Great earthquakes, such as the 1964 Good Friday earthquake in Alaska, have magnitudes of 8.0 or higher. On the average, one earthquake of such size occurs somewhere in the world each year. The Richter scale has no upper limit. Recently, another scale called the moment magnitude scale has been devised for more precise study of great earthquakes.

The Richter scale is not used to express damage. An earthquake in a densely populated area which results in many deaths and considerable damage may have the same magnitude as a shock in a remote area that does nothing more than frighten the wildlife. Large-magnitude earthquakes that occur beneath the oceans may not even be felt by humans.

4.3.2.3 Past Occurrence

There have been no recorded earthquakes occurring in Lawrence County, however on December 31, 2011 a 4.0 earthquake occurred around Youngstown, Ohio; August 23, 2011 a 5.9 earthquake occurred in Virginia and in January 2007, a 2.5 earthquake occurred just north of Meadville. Parts of the county experienced some of the shock waves from these minor earthquakes that have occurred around the region. Tremors

were also felt from earthquakes in Ontario Canada on June 23, 2011 and McDonald, Ohio on December 31, 2011.

Lawrence County has no earthquake building codes, therefore, should the county experience a substantial earthquake, it would be reasonable to expect that there could be extensive property and infrastructure damage and a significant loss of life.

Figure 11 - Earthquake Past Occurrences

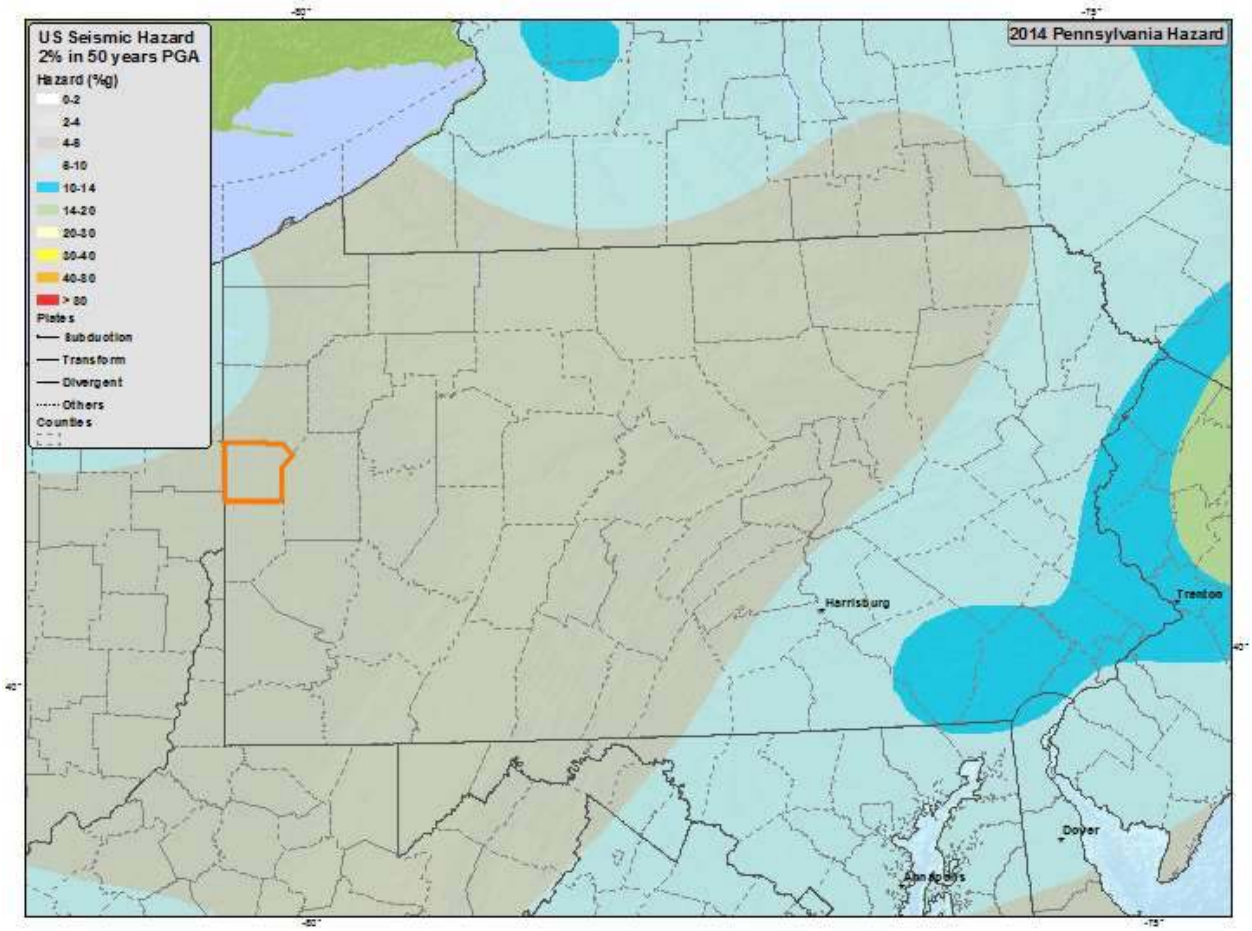
4.3.2.4 Future Occurrence

The probability of such an event occurring is unlikely. Lawrence County does not sit on any fault lines. A risk factor of 2.4 has been assigned to this hazard utilizing the risk factor assessment tool.

4.3.2.5 Vulnerability Assessment

Due to the low probability of an earthquake of sufficient destructive power in Lawrence County, dollar values of damage cannot be estimated with any relevancy. The only possible worst case scenario would involve a strong earthquake that damages a dam sufficiently to result in failure. In that case, the problem of damage is from flooding rather than direct damage to property due to the earthquake. The damage from a flood has dollar values determined elsewhere in this plan.

Figure 12 - Earthquake Vulnerability Zones



4.3.3. Extreme Temperatures (Hot or Cold)

Extreme cold temperatures drop well below what is considered normal for an area during the winter months and often accompany winter storm events. Combined with increases in wind speed, such temperatures in Pennsylvania can be life threatening to those exposed for extended periods of time. Extreme heat can be described as temperatures that hover 10°F or more above the average high temperature for a region during the summer months.

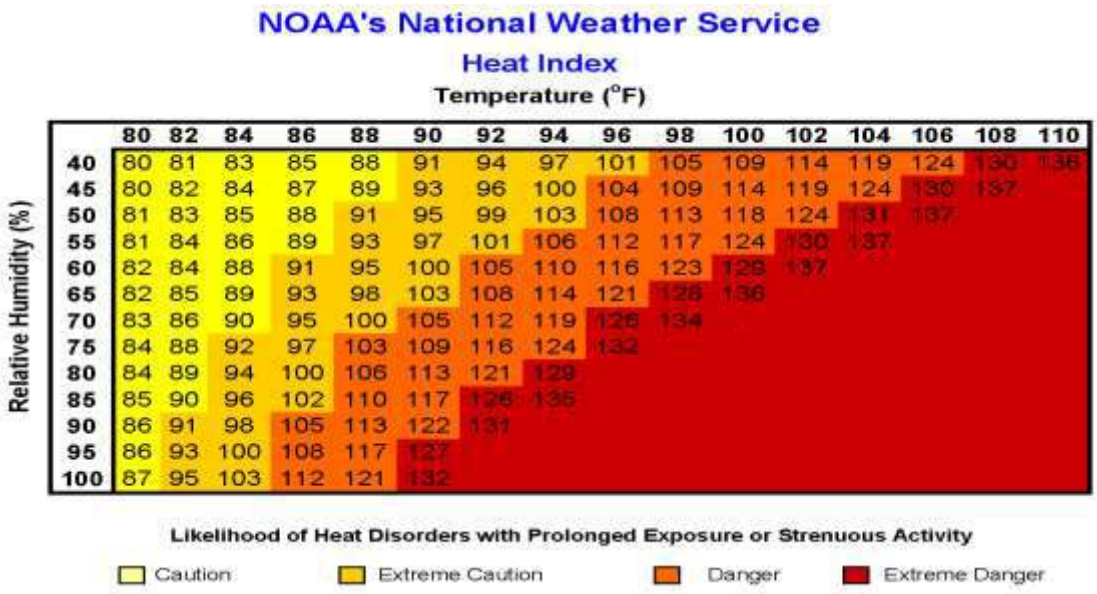
4.3.3.1 Location and Extent

Extreme temperatures can be devastating to any area. Extreme heat can cause sunburn, heat cramps, heat exhaustion, heat stroke, and dehydration. Likewise, extreme cold can cause hypothermia and frostbite. Lawrence County is subject to extreme temperatures in the summer and winter seasons.

4.3.3.2 Range of Magnitude

Extreme heat is responsible for more deaths in Pennsylvania than all other natural disasters combined. Extreme heat has killed on average 50 people per year between 1997 and 2004 in Pennsylvania. Floods, lighting, tornados and wind fatalities, and winter storms combine for an average of 15 deaths per year over the same time span in Pennsylvania. For Lawrence County the worst case scenario would be protracted extreme temperature occurrence well in excess of its historical highs and lows.

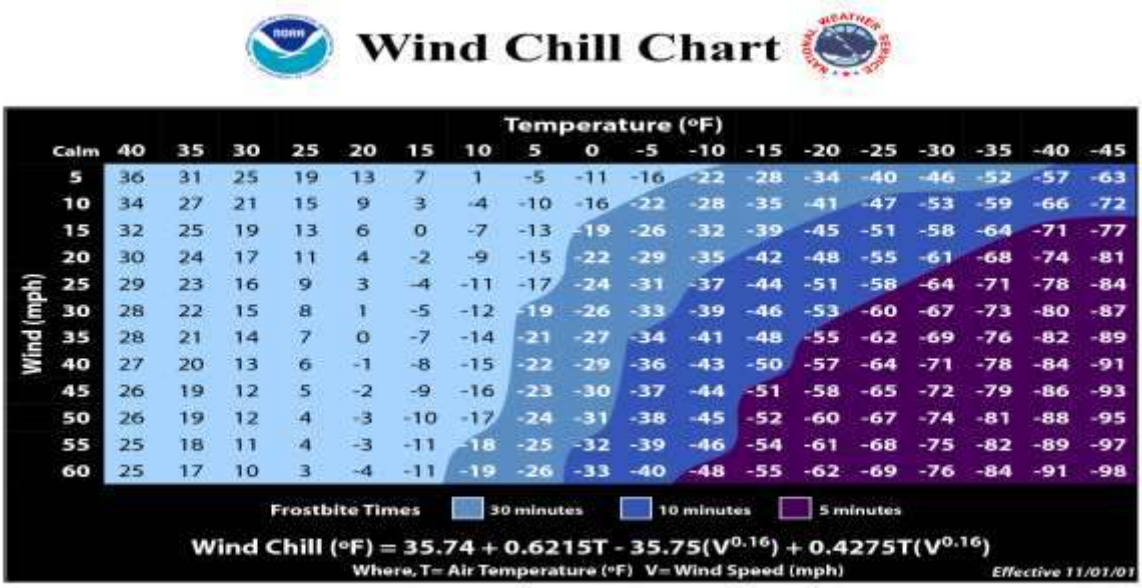
Figure 13 - NWS Heat Index



Source: www.nws.noaa.gov/os/heat/index

Extreme cold temperatures drop well below what is considered normal for an area during the winter months and often accompany winter storm events. Combined with increases in wind speed, such temperatures in Pennsylvania can be life threatening to those exposed for extended periods of time.

Figure 14 - NOAA Wind Chill Chart



Source: http://en.wikipedia.org/wiki/Wind_chill

Past Occurrence

Lawrence County experiences extreme heat regularly during the summer months. Between 1960 and 2000, the highest recorded temperatures were 103 degrees (July 16, 1988), 101 degrees (July 7, 1988), and 100 degrees (July 15, 1995 and August 17, 1988).

In January 1994, an arctic air mass caused temperatures to plunge 20 to 40 degrees below normal. The ambient air temperatures fell below zero for the overnight low. In Lawrence County, a 70 year old New Castle woman was found frozen to death on her porch. Hospitals area wide reported numerous cases of frostbite, hypothermia, and heart attacks from the extreme cold. *Error! Reference source not found.* summarizes the extreme temperature ranges since 1988.

Table 12 - Extreme Temperatures

Why Identified	Past Occurrences
Extreme heat is responsible for more fatalities than all other hazards combined. About 50 fatalities a year in Pennsylvania.	Extreme Heat Highest temperatures on record (1960 - 2000) July 16, 1988 (103) July 7, 1988 (101) August 17, 1988 (100) July 15,1995 (100) Extreme Cold January 1994 (-22 at Pittsburgh International Airport) January 1, 2014 Arctic cold Front -13 wind chill -36 at New Castle Airport 2/15/15 Arctic Cold Front – 16 low -25 wind chill 2/20/15 – Low temp -20 New Castle 2/24/15 – Low temp -24 at Elwood City

Future Occurrence

Extreme temperatures are expected during and around the summer and winter months. Extreme temperatures have occurred in Lawrence County in the past and will continue to occur in the future. Prediction of these events will continue to be enhanced with new technology and better recording of previous data and events.

Vulnerability Assessment

The potential for extreme heat and cold always exists in and around the summer and winter months. Meteorologists and weather forecasters can normally predict the temperature with excellent accuracy. Adhering to extreme temperature warnings can significantly reduce the risk of temperature related deaths.

The elderly and youth populations are most vulnerable to extreme temperatures due to their mobility challenges, disabilities, fixed income, etc., and susceptibility and reliance on the adult population, respectively. Extreme temperatures have regional and county wide impacts when they occur.

4.3.4. Flood, Flash Flood and Ice Jams

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period of time. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces. The severity of a

flood event is dependent upon a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, present soil moisture conditions, the degree of vegetative clearing as well as the presence of impervious surfaces in and around flood-prone areas (NOAA, 2009). Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams. All forms of flooding can damage infrastructure (USACE, 2007).

4.3.4.1 Location and Extent

Most of Lawrence County's municipalities are flood prone. Flood problems exist mostly in Shenango, Wilmington, Slippery Rock, Neshannock, and Pulaski Township's, and the City of New Castle. Municipal maps showing the flood prone zones are in Appendix D. The Shenango and Neshannock Rivers flow through the City of New Castle and are subject to flooding. Flooding occurs on an unnamed tributary of the Little Beaver Creek in the vicinity of Vine Street in Enon Valley Borough. The Lakewood and Neshannock Falls areas of Hickory Township have been affected by flooding in the past, and continue to pose a threat to the area. Some areas of Little Beaver Township are prone to flooding. However, only a small area of the population is directly affected.

With its ability to roll boulders the size of cars, tear out trees and destroy buildings and bridges, flooding is the leading cause of death among all types of natural disasters throughout the United States. 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 and dangerous hazard.

The National Flood Insurance Program (NFIP) publishes flood insurance rate maps. These maps identify the 1% annual chance of flood area. Special Flood Hazard Area (SFHA) and Base Flood Elevations (BFE) are developed from the 1% annual chance flood event. Structures located in the SFHA have a 26% chance of flooding in a 30 year period. The SFHA serves as the primary regulatory boundary used by county and municipal governments. Federal floodplain management regulations and mandatory flood insurance purchase requirements apply to the following high risk special flood hazard areas in *Table 13 - High Risk Zones*.

Table 13 - High Risk Zones

Special Flood Hazard Area High Risk Zones	
Zone	**Description**
A	Areas subject to inundation by the 1% annual chance flood event. Because detailed hydraulic analysis have not been performed, no base flood elevations or flood depths are shown
AE	Areas subject to inundation by the 1% annual chance flood event determined by detailed methods. BFEs are shown within these zones.
AH	Areas subject to inundation by the 1% annual chance shallow flooding (usually areas of ponding) where average depths are 1-3 feet. BFEs derived from detailed hydraulic analysis are shown in this zone.
AO	Areas subject to inundation by the 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are 1-3 feet. Average flood depths derived from detailed hydraulic analysis are shown within this zone.
AR	Areas that result from the decertification of a previously accredited flood protection system that is determined to be in the process of being restored to provide base flood protection.
Source: Federal Emergency Management Agency	

In the past, heavy rains have caused most of Lawrence County's flood problems. Heavy rains cause small creeks and streams to overflow their banks, which leads to road closures. 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.

4.3.4.2 Range of Magnitude

Potential flooding impacts range from very low to catastrophic depending on the type and location of flooding. The maximum threat of flooding in Lawrence County is estimated by looking at potential loss data and repetitive loss data, both analyzed in the risk assessment portion of the hazard mitigation plan.

The City of New Castle has the highest estimated potential residential and commercial loss due to flooding among all Lawrence County municipalities at $38,594,100.00 in assessed value. Taylor Township has the second highest estimated potential loss due to flooding at approximately $7,371,400.00.

The potential for loss of life and injuries to occur in these areas is high. Additionally, the long-term impact severe flooding could have on the health and safety of the citizens

is high. Depending on the scope and magnitude of the flooding, the likelihood of long-term economic disruption is possible. Flooding may have a moderate impact on property, facilities and infrastructure with varying levels of damage to structures in the affected area. Mobile homes are especially threatened by high water levels. Basic services may experience moderate impacts, as disruptions for short periods of time could occur. Government operations are expected to continue without disruption. The environmental impact should be minimal, unless hazardous materials are released as a result of the flooding.

Power failures are the most common secondary effect associated with flooding. Coupled with a shortage of critical services and supplies, power failures could cause a public health emergency. Disruption in traffic flow may cause a transportation accident. Flooding also has the potential to cause other hazards, such as landslides, hazardous material spills and dam failures.

Industrial, commercial and public infrastructure facilities can become inundated with flood waters, threatening the continuity of government and business. The special needs population must be tracked and identified in flooding situations, as they are often homebound.

Severe flooding can have long-term secondary effects on the population, economy and infrastructure of Lawrence County. Escalating costs of damage to private structures and the frequency of flooding can cause permanent population displacement. Small businesses that contribute to the local economy may close if they are unable to recover from the disaster. Disruption to the commerce and/or transportation modes can have an adverse effect on municipal economies in affected areas. Critical infrastructure, such as sewage and water treatment facilities, can be severely damaged. This can have a significant effect on public health. High flood waters can cause sewage systems to fail, overflow and contaminate groundwater and drinking water.

Although floods can cause damage to property and loss of life, floods are naturally occurring events that benefit riparian systems which have not been disrupted by human actions. Such benefits include groundwater recharge and the introduction of nutrient rich sediment improving soil fertility. However, the destruction of riparian buffers, changes to land use and land cover throughout a watershed and the introduction of chemical or biological contaminants which often accompany human presence cause environmental harm when floods occur. Hazardous material facilities are potential sources of contamination during flood events. Other negative environmental impacts of flooding include: water-borne diseases, heavy siltation, damage or loss of crops and drowning of both humans and animals.

4.3.4.3 Past Occurrence

Lawrence County has experienced numerous flooding, flash flooding and ice jam flooding events in the past. The flooding and flash flooding was caused by a variety of storms,

tropical storms, ice jams and other issues. The most significant occurrence of flooding is due to heavy storms with rain. A summary of the flood history of Lawrence County is noted below in *Table 14 - Flood Event History.*

Table 14 - Flood Event History

Lawrence County Flood Event History			
Date	**Location**	**Type**	**Deaths**
04/12/94	Countywide	Flood/Flash Flood	0
07/23/94	Bessemer	Flash Flood	0
06/11/95	Clover	Flood/Flash Flood	0
06/11/95	Clover	Flood/Flash Flood	0
06/27/95	New Castle	Flood/Flash Flood	0
01/18/96	Bessemer	Flash Flood	0
01/19/96	New Castle	Flash Flood	0
01/19/96	New Castle	Flash Flood	0
02/20/96	Bessemer	Flash Flood	0
03/19/96	New Castle	Flash Flood	0
03/19/96	West Pittsburg	Flash Flood	0
05/11/96	Nashua	Flash Flood	0
05/12/96	Nashua	Flash Flood	0
06/22/96	New Castle	Flash Flood	0
12/11/96	Pulaski	Flash Flood	0
09/10/97	PAZ013	Flood	0
01/23/99	Countywide	Flood	0
07/28/99	Countywide	Flash Flood	0
07/28/99	Countywide	Flash Flood	0
07/29/99	Princeton	Flash Flood	0
08/23/00	New Castle	Flood	0
04/07/01	West Pittsburg	Flood	0
04/14/02	PAZ013	Flood	0
06/13/03	New Castle	Flash Flood	0
07/04/03	New Castle	Flash Flood	0
07/04/03	New Castle	Flash Flood	0
07/22/03	New Castle	Flash Flood	0
07/22/03	Hillsville	Flash Flood	0
07/23/03	PAZ013	Flood	0
07/27/03	New Castle	Flash Flood	0
07/28/03	PAZ013	Flood	0
08/07/03	New Castle	Flash Flood	0
08/09/03	New Castle	Flash Flood	0
08/26/03	New Castle	Flash Flood	0
09/01/03	New Castle	Flash Flood	0
09/01/03	Neshannock Falls	Flash Flood	0
09/01/03	Neshannock Falls	Flash Flood	0
09/03/03	New Castle	Flash Flood	0
09/03/03	New Castle	Flash Flood	0
11/19/03	New Castle	Flash Flood	0
01/04/04	PAZ013	Flood	0
05/22/04	Ellwood City	Flash Flood	0
05/22/04	PAZ013	Flood	0
08/28/04	New Wilmington	Flash Flood	0
09/08/04	PAZ013	Flood	0
09/17/04	PAZ013	Flood	0

Lawrence County Flood Event History			
Date	**Location**	**Type**	**Deaths**
01/06/05	PAZ013	Flood	0
06/22/06	Volant	Flash Flood	0
07/30/06	New Castle	Flash Flood	0
07/31/06	New Castle	Flash Flood	0
08/20/07	Ellwood City	Flash Flood	0
08/20/07	New Castle	Flash Flood	0
08/20/07	Mahoningtown	Flash Flood	0
02/06/08	Ellwood City	Flood	0
03/19/08	Coverts	Flood	0
05/31/08	New Castle	Flood	0
02/08/09	Neshannock Falls	Flood	0
02/09/09	Harlansburg	Flood	0
12/01/10	Ellwood City	Flood	0
02/28/11	Energy	Flood	0
02/28/11	Nashau	Flood	0
07/10/13	New Castle	Flash Flood	0
07/10/13	Ellwood City	Flash Flood	0
07/10/13	New Castle	Flash Flood	0
06/25/14	Plain Grove	Flood	0

Lawrence County was declared a disaster area in the summer of 2003 due to heavy rains that resulted in widespread flooding. Damages resulting from these storms were reported in 19 of 27 municipalities within the county. The total estimated cost of damage to these municipalities was $6,770,601.27. Damage from this flooding event affected personal property and contents, municipal property and businesses property and contents. Total dollars in federal assistance received for this declaration was $422,686.00.

In addition to the aforementioned past flood events, the National Flood Insurance Program identifies properties that frequently experience flooding. *Repetitive loss properties* are structures insured under the NFIP which have had at least two paid flood losses of more than $1,000 over any ten year period since 1978. A property is considered a *severe repetitive loss property* either when there are at least four losses each exceeding $5,000 or when there are two or more losses where the building payments exceed the property value. As of June 16, 2015, there are no repetitive loss and severe repetitive loss properties in Lawrence County.

Table 15 - Municipal NFIP Policies

National Flood Insurance Program Policies per Municipality			
MUNICIPALITY	**NFIP Policies**	**MUNICIPALITY**	**NFIP Policies**
City of New Castle	145	Pulaski Township	1
Bessemer Borough	5	S.N.P.J. Borough	0
Ellport Borough	0	Scott Township	14
Ellwood City Borough	0	Shenango Township	16
Enon Valley Borough	3	Slippery Rock Township	2
Hickory Township	15	South New Castle Borough	3
Little Beaver Township	5	Taylor Township	1
Mahoning Township	16	Union Township	6
Neshannock Township	10	Volant Borough	3
New Beaver Borough	3	Wampum Borough	4
New Wilmington Borough	1	Washington Township	0
North Beaver Township	6	Wayne Township	6
Perry Township	3	Wilmington Township	13
Plain Grove Township	2		
		TOTAL	**283**

4.3.4.4 Future Occurrence

Table 16 - Flood Probability Summary

Flood Probability Summary	
Flood Recurrence Intervals	**Chance of Occurrence**
10-year	10.00%
50-year	2.00%
100-year	1.00%
500-year	0.20%
Source: Federal Emergency Management Agency	

Flooding is a frequent problem throughout Pennsylvania. The probability of a flooding event impacting Lawrence County is highly likely. Lawrence County experiences some degree of flooding annually. The threat of flooding is compounded in the late winter and early spring months, as melting snow can overflow streams, creeks and tributaries, increasing the amount of groundwater, clogging stormwater culverts and bridge openings. The NFIP recognizes the 1%-annual-chance flood, also known as the *special flood hazard area (SFHA)*, as the standard for identifying properties subject to federal flood insurance purchase requirements. A 1%-annual-chance flood is a flood which has a 1% chance of occurring over a given year. The digital flood insurance rate maps (DFIRMs) are used to identify areas subject to the 1% annual-chance flooding. A property's vulnerability to a flood is dependent upon its location in the floodplain. The properties that reside 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 just designates the probability of a flood of this magnitude every year. Further away from this area is the 50-year floodplain. This area includes all

of 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 *Table 16 - Flood Probability Summary*.

4.3.4.5 Vulnerability Assessment

River and Stream Flooding:

Lawrence County is vulnerable to flooding events. Flooding puts the entire population at some level of risk, whether through the flooding of homes, businesses, places of employment, or the road, sewer and water infrastructure. High floodwaters can devastate homeowners with both property damage and property loss. Lawrence County's population is also vulnerable to the secondary effects of flooding. Power loss can leave citizens without heat for extended periods of time. The transportation infrastructure of the county can be severely 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.

Lawrence County's economy is highly vulnerable to flooding events. 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 operation. 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.

Minor flooding events in Lawrence County present a moderate vulnerability to the environment. For the most part, flooding is a natural occurrence and, alone, cannot do much harm to the environment. However, the environment is vulnerable to the secondary effects of flooding such as hazardous material spills. For example, flooding can result in contamination when raw sewage, animal waste, chemicals, pesticides, or other hazardous materials are suspended and transported through flood waters to sensitive habitats, neighborhoods, or business settings. Events such as these require major clean-up and remediation efforts.

Table 17 - Critical Facilities identifies the critical facilities within Lawrence County that are located within the special flood hazard area and the assessed value of the building. *Table 18 - Addressable Structures* identifies the quantity of various addressable structures that are located in the special flood hazard area. The structures were identified using county GIS data. Critical facilities are facilities that if damaged would present an immediate threat to life, public health and safety.

Table 17 - Critical Facilities

Lawrence County Critical Facilities in the Special Hazard Flood Area		
Name	**Facility Type**	**Building Assessed Value**
Tanner Industries	SARA Facility	$29,900.00
Sciota Street Apartments	HUD	$510,300.00
Pennsylvania American Water Treatment Plant - New Castle	SARA Facility	$168,800.00
Pennsylvania American Water Treatment Plant - Ellwood City	SARA Facility	$615,100.00
Oakview of New Castle	Human Services Facility	$226,400.00
New Castle Sanitation	SARA Facility	$3,063,100.00
New Castle Public Library	Library	$1,524,700.00
New Castle Fire Department	Fire Department	$698,700.00
New Castle Community YMCA	YMCA	$1,072,600.00
New Castle Area Transit Authority	Transit	$921,200.00
Neshannock Village	HUD	$1,277,100.00
Mahoning Twp Waste Water Treatment Plant	SARA Facility	$27,800.00
Mahoning Township VFD - Edinburg	Fire Department	$45,200.00
Human Services Center	Human Services Facility	$113,800.00
Grant Street Apartments	HUD	$130,500.00
Ellwood Quality Steel	SARA Facility	$1,367,400.00
City Rescue Mission	Human Services Facility	$123,300.00
Big Run Apartments	HUD	$581,600.00
Source: Lawrence County GIS		

Lawrence County is vulnerable to flooding that causes loss of lives, property damage and road closures. For purposes of assessing vulnerability, the county focused on community assets that are located in the 1%-annual-chance floodplain. While greater and smaller floods are possible, information about the extent and depths for this floodplain is available for all municipalities countywide, thus providing a consistent basis for analysis. Flood vulnerability maps for each applicable local municipality, showing the 1%-annual-chance flood hazard area and addressable structures, critical facilities and transportation routes within it, are included in Appendix D. These maps were created using county GIS data and the FEMA countywide digital flood data.

Table 18 - Addressable Structures

Lawrence County Addressable Structures in the Special Hazard Flood Area														
Municipality	Addressable Structure	Day Care	Fire Station	Government Facility	Group Home	Human Services Facility	Lodging	Miscellaneous Utility	Multiple Address Structure	Police Station	Post-Secondary Education	SARA Facility	Special Care Facility	**Total**
Bessemer Borough	17	0	0	0	0	0	0	0	2	0	0	0	0	19
Ellport Borough	9	0	0	0	0	0	0	1	0	0	0	0	0	10
Ellwood City Borough	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Enon Valley Borough	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Hickory Township	61	0	0	0	0	0	0	1	0	0	0	0	0	62
Little Beaver Township	35	0	0	0	0	0	0	0	0	0	0	0	0	35
Mahoning Township	50	0	1	0	0	0	0	1	0	0	0	0	0	52
Neshannock Township	23	0	0	0	0	0	0	1	0	0	0	1	0	25
New Beaver Borough	28	0	0	0	0	0	0	1	0	0	0	0	0	29
New Castle City	328	1	1	0	3	7	1	0	142	1	3	4	1	492
New Wilmington Borough	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Beaver Township	32	0	0	0	0	0	0	0	0	0	0	0	0	32
Perry Township	17	0	0	0	0	0	0	0	2	0	0	0	0	19
Plain Grove Township	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Pulaski Township	11	0	0	0	0	0	0	0	0	0	0	1	0	12
Scott Township	52	0	0	0	0	0	0	0	0	0	0	0	0	52
Shenango Township	84	0	0	0	0	0	0	1	0	0	0	0	0	85
Slippery Rock Township	20	0	0	0	0	0	0	0	0	0	0	0	0	20
SNPJ Borough	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South New Castle Borough	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taylor Township	12	0	0	0	0	0	0	0	0	0	0	1	0	13
Union Township	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Volant Borough	13	0	1	1	0	0	0	0	6	0	0	0	0	21
Wampum Borough	18	0	0	0	0	0	0	1	0	0	0	1	0	20
Washington Township	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wayne Township	28	0	1	0	0	0	0	1	2	0	0	1	0	33
Wilmington Township	48	0	0	0	0	0	0	0	0	0	0	0	0	48
Total	903	1	4	1	3	7	1	8	154	1	3	9	1	1096

A risk factor was determined for each municipality in Lawrence County utilizing the summary of risk factor approach document for flooding. The results for each municipality are identified in *Table 19 - Flooding Risk Factor*. Risk Factors identified as high risk have risk factors greater than or equal to 2.5. Risk Factors 2.0 to 2.4 are considered moderate risk hazards. Risk Factors less than 2.0 are considered low risk. According to the default weighting scheme applied, the highest possible risk factor value is 4.0.

Table 19 - Flooding Risk Factor

Flooding Risk Factor Results per Municipality						
FLOODING HAZARD PER MUNICIPALITY	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
Lawrence County	4	2	3	2	3	2.8
City of New Castle	4	3	3	3	3	3.3
Bessemer Borough	4	1	2	3	3	2.5
Ellport Borough	4	1	2	3	3	2.5
Ellwood City Borough	4	2	3	2	3	2.9
Enon Valley Borough	4	1	2	3	3	2.5
Hickory Township	4	2	3	2	3	2.9
Little Beaver Township	4	1	2	3	3	2.5
Mahoning Township	4	2	3	2	3	2.9
Neshannock Township	4	1	2	3	3	2.5
New Beaver Borough	4	1	2	3	3	2.5
New Wilmington Borough	4	1	2	3	3	2.5
North Beaver Township	4	1	2	3	3	2.5
Perry Township	4	1	2	3	3	2.5
Plain Grove Township	4	1	2	3	3	2.5
Pulaski Township	4	1	2	3	3	2.5
S.N.P.J. Borough	3	1	1	3	3	2.3
Scott Township	4	2	3	2	3	2.9
Shenango Township	4	2	3	2	3	2.9
Slippery Rock Township	4	2	3	2	3	2.9
So. New Castle Borough	4	2	3	2	3	2.9
Taylor Township	4	2	3	2	3	2.8
Union Township	4	2	3	2	3	2.9
Volant Borough	4	2	3	2	3	2.9
Wampum Borough	4	2	3	2	3	2.9
Washington Township	4	1	2	3	3	2.5
Wayne Township	4	2	3	2	3	2.9
Wilmington Township	4	2	3	2	3	2.9

Flash Flooding:

Flash flooding can occur anywhere within Lawrence County when the conditions are right. Locations that are more populated and have more impervious ground have a higher vulnerability to flash flooding. During the risk assessment process, numerous resources were utilized to determine flash flooding locations. Municipalities were asked to identify locations within the municipality that are prone to frequent flash flooding. The National Climatic Data Center was also queried to determine flash flood vulnerable areas. This data is reflected in *Table 14 - Flood Event History* above.

Locations that are identified as vulnerable to flash flooding in Lawrence County are as follows:

- City of New Castle
- Neshannock
- Pulaski
- Shenango
- Slippery Rock
- Wilmington

Although the above locations were identified as vulnerable areas within Lawrence County, they are not the only locations that are vulnerable to flash flooding. The Lawrence County Hazard Mitigation Team will continue to work with municipalities to identify vulnerable flash flooding locations and identify vulnerable special needs population and critical facilities.

Ice Jam Flooding:

Ice jam flooding has affected five specific locations within Lawrence County. Areas along Neshannock Creek are the most vulnerable. The affected areas are Volant Borough, Washington Township, Wilmington Township, Hickory Township and Neshannock Township. The ice jam flooding also causes erosion to the river banks in the area as well. The last significant ice jam event was in 2009.

The Lawrence County Hazard Mitigation Team will continue to work with municipalities to identify vulnerable ice jam flooding locations and identify vulnerable special needs population and critical facilities.

4.3.5. Hurricane and Tropical Storm

4.3.5.1 Location and Extent

Hurricanes, tropical storms and depressions will occur in the county in the summer and fall months. Most hurricanes that approach Lawrence County have been downgraded to tropical storms or tropical depressions by the time they reach the county. Heavy rain and flooding produced by a hurricane, tropical storm, or tropical depression will have the greatest impact on the county. Impacts of these events are normally county wide in nature and affect numerous counties at one time.

Tropical storm systems that impact Lawrence County develop in the tropical and subtropical waters of the Atlantic Ocean or Gulf of Mexico. Rarely the center of circulation of these storm systems move inland and pass through Lawrence County. Most of the impacts to Lawrence County are from systems that have been downgraded to tropical depressions. These storms have the ability to produce high volumes of rainfall that cause flash flooding initially and then follow with stream and river flooding.

4.3.5.2 Range of Magnitude

Hurricanes and tropical storms usually have a regional impact as opposed to only affecting Lawrence County. Flooding and power outages are major secondary effects of hurricanes and tropical storms. Heavy rain can lead to large amounts of ground water that cannot be contained by streams and creeks. Power outages can be caused by high continuous winds that cause power lines to fail. Tropical Storm Frances in 2004 caused the most significant flooding and damage in Lawrence County.

Tropical cyclones with maximum sustained winds of less than 39 miles per hour are called tropical depressions. A tropical storm is a cyclone with maximum sustained winds between 39-74 miles per hour. A hurricane is a cyclone with sustained winds of 74 miles per hour or greater. Hurricanes are classified as category 1 through category 5. Category 1 has maximum sustained winds of 74-95 miles per hour. A category 5 hurricane has maximum sustained winds of greater than or equal to 156 miles per hour.

Table 20 - Saffir-Simpson Scale

Saffir-Simpson Hurricane Scale		
Category	Wind Speed	
	mph	knots
5	≥156	≥135
4	131-155	114-134
3	111-130	96-113
2	96-110	84-95
1	74-95	65-83
Non-Hurricane Classifications		
Tropical Storm	39-73	34-64
Tropical Depression	0-38	0-33

The Saffir-Simpson Hurricane Scale is the most common tool used to classify tropical storms and hurricanes. *Table 20 - Saffir-Simpson Scale* outlines the categorization of these events.

4.3.4.3 Past Occurrence

The National Climatic Data Center was queried for tropical depressions, tropical storms and hurricanes that have occurred in Lawrence County. No events were identified for Lawrence County in this resource.

There are two significant tropical events that have impacted Lawrence County in the past. Tropical Storm Agnes occurred in 1972. Agnes was a system that impacted Lawrence County with large amounts of rain. The rain fall that occurred in Lawrence County caused local flash flooding and eventually stream and river flooding.

Table 21 - Tropical Storm Events outlines other tropical storm events that have affected Lawrence County.

Table 21 - Tropical Storm Events

Tropical Storm Events Affecting Lawrence County	
Year	Event
1972	Tropical Storm Agnes
1999	Hurricane Floyd
2003	Tropical Storm Isabel/Henri
2004	Tropical Depression Frances
2004	Tropical Depression Ivan

4.3.5.4 Future Occurrence

Based on risk factor assessments there is an unlikely probability of hurricanes and tropical storms affecting Lawrence County. A risk factor of 1.8 has been determined for this hazard based on the risk factor assessment tool. Hurricanes and tropical storms occur with relatively high frequency with 12.1 tropical storms and 6.4 hurricanes predicted annually for the North Atlantic basin, according to the National Climatic Data Center. The eastern portions of Pennsylvania are more likely to experience hurricanes and tropical storms.

4.3.5.5 Vulnerability Assessment

A vulnerability assessment for hurricanes and tropical storms focuses on the impacts of flooding and severe wind. Therefore, the assessment of vulnerability is addressed in section 4.3.4.5 for flooding impacts and section 4.3.11.5 for wind damage.

The 2013 Pennsylvania Hazard Mitigation Plan, section 4.3.7 of the hurricane, tropical storm and nor'easter hazards profile identifies that Lawrence County has a less than 6% annual risk of an Atlantic Basin hurricane or tropical storm occurring.

4.3.6. Invasive Species

4.3.6.1 Location and Extent

An invasive species is a species that is not indigenous to a given ecosystem and that, when introduced to a non-native environment, is likely to cause economic or environmental harm, or pose a hazard to human health. The Commonwealth of Pennsylvania, including Lawrence County, plays host to a number of invasive pathogens, insects, plants, invertebrates, fish and higher mammals.

These species have largely been introduced by the actions of humans. Common pathways for invasive species threats include the unintentional release of species, the movement of goods and equipment that may unknowingly harbor species, smuggling, ship ballast, hull fouling and escape from cultivation (Governor's Invasive Species Council, 2010). Invasive species threats are generally divided into two main subsets:

Aquatic invasive species (AIS) are a subset that impact aquatic ecosystems. Aquatic invasive species are defined in this document as non-native species that threaten the diversity or abundance of native species, the ecological stability of infested waters, human health and safety, or commercial, agriculture, aquaculture, or recreational activities dependent on such waters. The Commonwealth's varied geology and topography contribute to the large variety of aquatic and estuarine habitats. Pennsylvania encompasses six different landforms, ranging from coastal plain to the Appalachian Mountains. The Commonwealth hosts more than 84,000 miles of streams and shares five major watersheds with other states and Canada. According to the National Wetland Inventory, there are a total of 729,535 wetland acres found in more than 160,000 wetlands across the state.

Terrestrial invasive species (TIS) are a subset that impact primarily terrestrial ecosystems. Estimates of the number of non-native species that have been introduced into the United States vary widely (from 5,000 to as many as 50,000). Terrestrial ecosystems in Pennsylvania include a rich variety of community types and cover a range extending from nearly aquatic wetlands along our coasts and myriad rivers, lakes and streams, to mountain tops. Terrestrial species are those species that complete their lifecycle on land vs. in an aquatic environment. Three groups of organisms have been successful in

adapting to dry, terrestrial environments: vascular plants, arthropods and higher vertebrates.

The Governor's Invasive Species Council of Pennsylvania (PISC), the lead organization for invasive species threats, has identified over 100 species threats that are or could potentially become significant in Pennsylvania. Of these threats, county and municipal leaders believe that the most significant are invasive forest pests like the Emerald Ash Borer, Eurasian Wood Wasp, Exotic Bark Beetle, Asian Long Horned Beetle, Sudden Oak Death, Hemlock Woolly Adelgid, the Gypsy Moth and vascular plants, especially Purple Loosestrife, Japanese Knotweed, Garlic Mustard and Multi-flora Rose.

Adelges tsugae, the hemlock woolly adelgid (HWA), is a fluid-feeding insect that feeds on hemlock trees throughout eastern North America, including Pennsylvania. The egg sacs of these insects look like the tips of cotton swabs clinging to the undersides of hemlock branches.

Hemlock woolly adelgid was introduced from Asia into the Pacific Northwest in 1924. It was probably introduced into the northeastern US in the 1950's and it was first discovered in Pennsylvania in 1967. This insect has been damaging hemlock ever since and it is spreading. To date, 49 counties in Pennsylvania including Lawrence County have been infested with this insect.

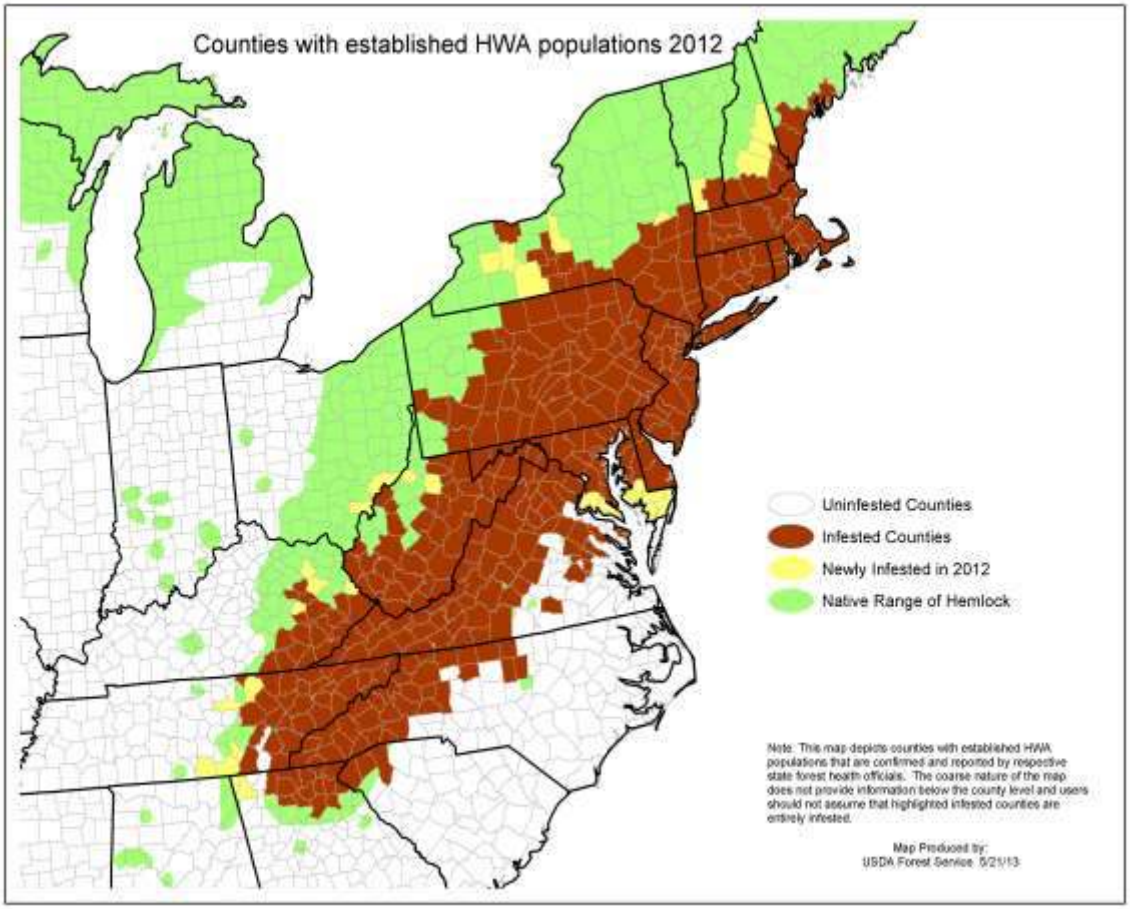
Eastern hemlock (Pennsylvania's state tree) and Carolina hemlocks (found further south in the Smoky Mountain sections of the Appalachians) are more susceptible to hemlock woolly adelgid damage than Asian and western hemlock trees due to feeding tolerance and predators that protect the latter species. Hemlock woolly adelgid sucks fluid from the base of hemlock needles. It may also inject toxins into the tree as it feeds, accelerating needle drop and branch dieback. Although some trees die within four years, trees often persist in a weakened state for many years. Hemlocks that have been affected by hemlock woolly adelgid often have a grayish-green appearance (hemlocks naturally have a shiny, dark green color).

Other factors can influence the impact of the hemlock woolly adelgid. Other insects, such as elongate hemlock scale, hemlock borer and spittlebugs, which are also found on hemlock, can compound the impact of hemlock woolly adelgid. Drought and fungi, such as Fabrella or Korfia tsugae can weaken hemlock and cause it to become more susceptible to insect damage. Low winter temperatures, cold snaps (episodes of freezing and thawing) and heavy thunderstorms can reduce populations of the hemlock woolly adelgid. Particularly in the mountains, it is not uncommon to find hemlocks where the insect has been killed on the top third of the trees, where it's colder and windier, but survive on the bottom two-thirds. On the other hand, mild winters can result in sharp increases in hemlock woolly adelgid populations.

PA DCNR is currently attempting to map ecologically significant hemlock stands in the state, in order to detect new infestations, focus their control efforts and predict areas

most vulnerable to hemlock woolly adelgid. They are using a variety of remote-sensing and ground-based techniques to accomplish this objective. Remote sensing technologies are also being evaluated for monitoring hemlock woolly adelgid. DCNR is cooperating with Rutgers to expand an algorithm developed for using Landsat imagery to detect changes in hemlock health in NJ to PA. DCNR and USFS are working with cooperators to determine if hyperspectral images taken from helicopters can detect new infestations along the leading edge and in isolated patches.

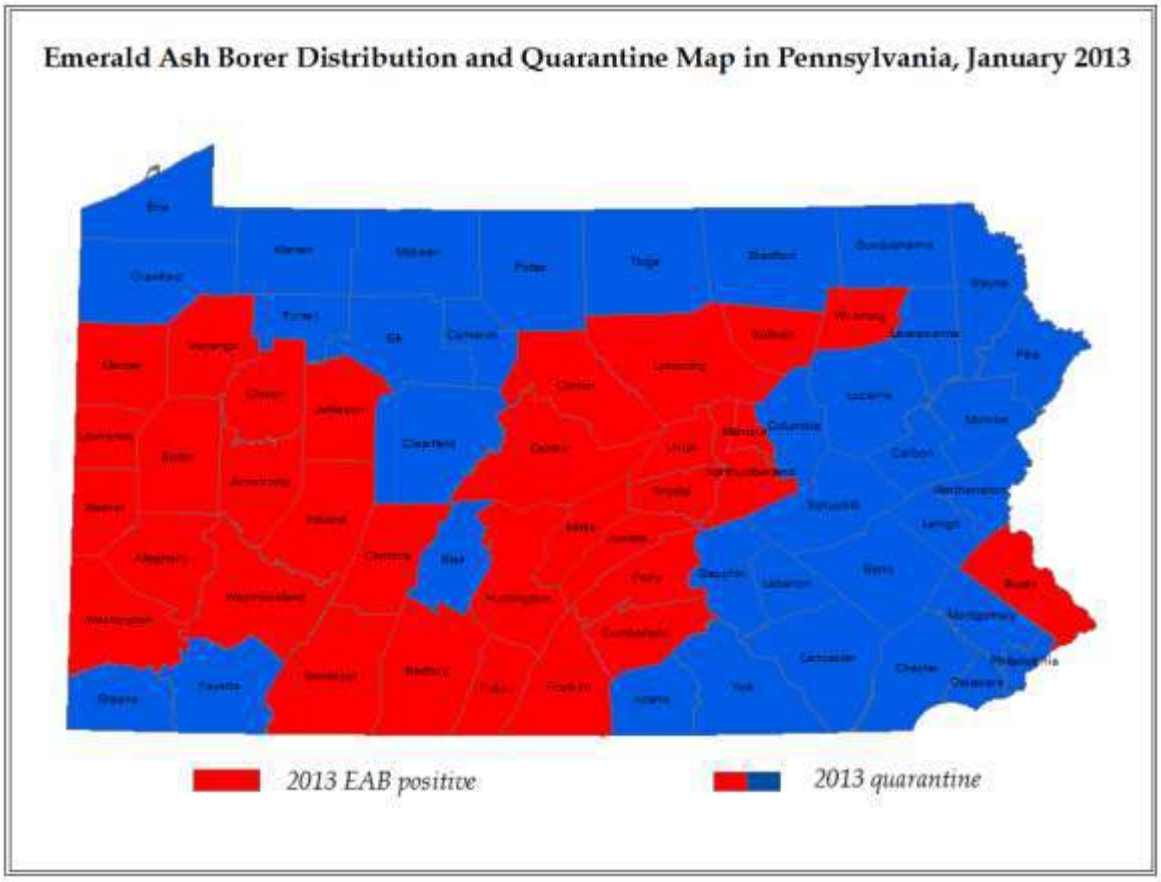
Figure 15 - HWA Population Map



http://na.fs.fed.us/fhp/hwa/maps/distribution.shtm

The location and extent of these invasive threats depends on the preferred habitat of the species as well as the species' ease of movement and establishment. In 2013 Lawrence County was in the positive zone for the Emerald Ash Borer (See Figure 16).

Figure 16 - Emerald Ash Borer Quarantine Map



http://www.dcnr.state.pa.us/conservationscience/invasivespecies/

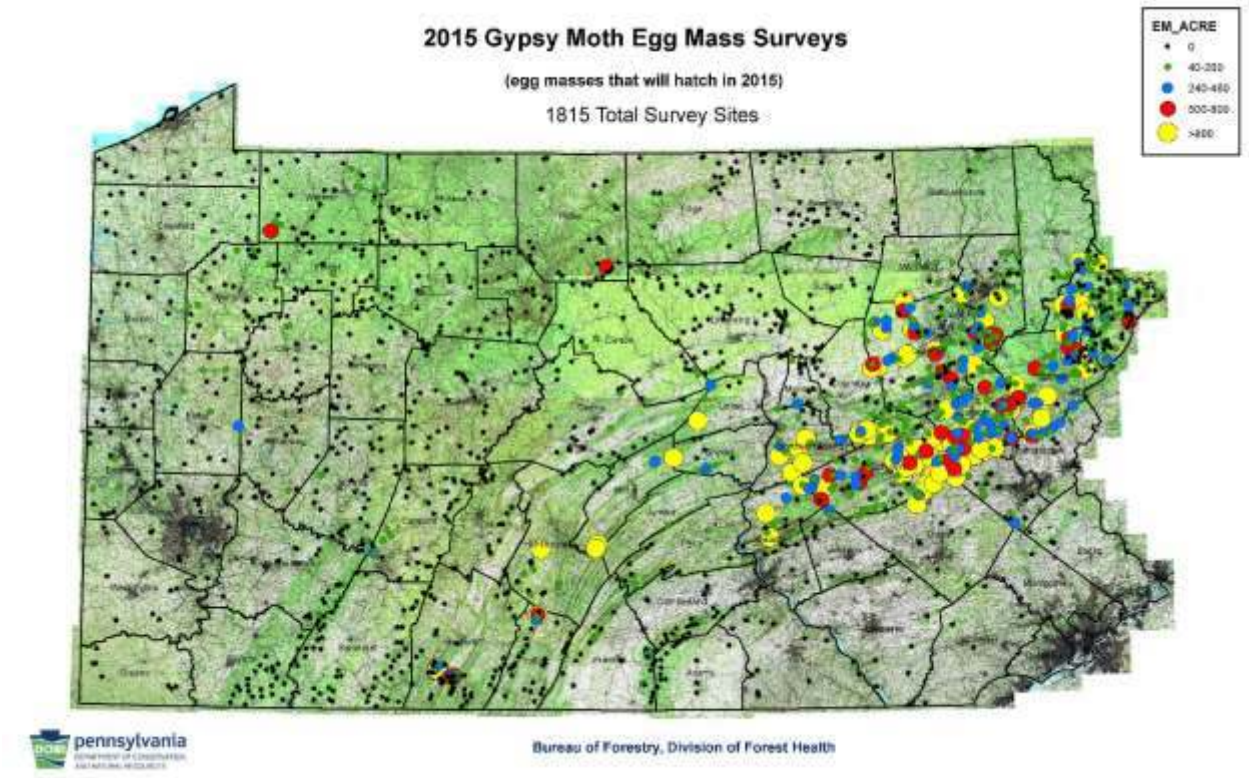
The gypsy moth, Lymantria dispar, is one of North America's most devastating forest pests. The species originally evolved in Europe and Asia and has existed there for thousands of years. In either 1868 or 1869, the gypsy moth was accidentally introduced near Boston, Massachusetts by E. Leopold Trouvelot. About 10 years after this introduction, the first outbreaks began in Trouvelot's neighborhood and in 1890 the State and Federal Government began their attempts to eradicate the gypsy moth. These attempts ultimately failed and since that time, the range of gypsy moth has continued to spread. Every year, isolated populations are discovered beyond the contiguous range of the gypsy moth but these populations are eradicated or they disappear without intervention. It is inevitable that gypsy moth will continue to expand its range in the future.

The gypsy moth is known to feed on the foliage of hundreds of species of plants in North America but its most common hosts are oaks and aspen. Gypsy moth hosts are located through most of the coterminous US but the highest concentrations of host trees are in

the southern Appalachian Mountains, the Ozark Mountains and in the northern lake states.

Gypsy moth populations are typically eruptive in North America; in any forest stand densities may fluctuate from near 1 egg mass per ha to over 1,000 per ha. When densities reach very high levels, trees may become completely defoliated. Several successive years of defoliation, along with contributions by other biotic and abiotic stress factors, may ultimately result in tree mortality. In most northeastern forests, less than 20% of the trees in a forest will die but occasionally tree mortality may be very heavy.

Figure 17 - 2015 Gypsy Moth Egg Mass Surveys



http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_20030771.pdf

4.3.6.2 Range of Magnitude

The magnitude of invasive species threats ranges from nuisance to widespread killer. Some invasive species are not considered agricultural pests and do not harm humans. Other invasive species can cause significant changes in the composition of Pennsylvania's ecosystems. For example, the Emerald Ash Borer has a 99 percent mortality rate for any ash tree it infects. This and other forest-feeding invasive species could have a significant economic impact in the county, since it hosts some forest-based tourism. Still, more invasive species can cause widespread illness or death in humans.

There is a wide range of environmental impacts caused by invasive species. The aggressive nature of many invasive species can cause significant reductions in biodiversity by crowding out native species. This can affect the health of individual host organisms as well as the overall well-being of the affected ecosystem. Beyond causing human, animal and plant harm, there are secondary impacts of invasive species that go beyond harm to host species and ecosystems, particularly in the case of invasive species that attack and prevent soil degradation and erosion, protect watersheds, stabilize slopes and absorb carbon dioxide emissions. The key role of forests in the hydrologic system means that if forested land is wiped out, the effects of erosion and flooding will be amplified. There would also be an impact on agricultural harvests.

The magnitude of an invasive species threat is generally amplified when the ecosystem or host species is already stressed, such as in times of drought. The already weakened state of the native ecosystem causes it to more easily succumb to an infestation. A worst case example could be the Hemlock Woolly Adelgid causing reduced biodiversity, increased wildfire potential and thermal harm to small stream cold water fisheries and habitats.

4.3.6.3 Past Occurrence

Invasive species have been entering Pennsylvania since the arrival of early European settlers. A 2011 Forest Health Report shows the presence of Emerald Ash Borer in Sullivan, Lycoming and Wyoming Counties. Lawrence County was listed as positive for the Emerald Ash Borer in the 2013 Forest Health Report. The Hemlock Woolly Adelgid has not yet been found in Lawrence County, although according to Northern Research Station it will reach the Allegheny National Forest (located to the northeast of Lawrence County) by 2018 based on the current rate of spread. This Japanese native was introduced into the Eastern United States in the 1950s and is currently established in 16 Eastern States from Georgia to Maine. It was first discovered in Pennsylvania in 1967 and is now found in 44 counties in the eastern two-thirds of the State.

Though there are no state forests in Lawrence County there are forested areas in the county such as McConnell's Mill State Park that could be affected and well as other rural areas throughout the county.

4.3.6.4 Future Occurrence

According to the PISC, the probability of future occurrence for invasive species threats is on the rise because of the growing volume of transported goods, increasing technology, efficiency and speed of transportation and expanding international trade agreements. Expanded global trade has created opportunities for many organisms to be transported to and establish themselves in new countries and regions. Furthermore, it is claimed by some that climate change could contribute to the introduction of new invasive species. As maximum and minimum seasonal temperatures change, pests are

able to establish themselves in previously inhospitable climates. This also gives introduced species an earlier start and increases the magnitude of their growth. This may shift the dominance of ecosystems in the favor of non-native species.

In order to combat the increase in future occurrences, the PISC, which is a collaboration of state agencies, public organizations and federal agencies, released the Invasive Species Management Plan in April 2010. This plan outlines the Commonwealth's goals for the management of the spread of non-native invasive species, as well as creates a framework for responding to threats through research, action and public outreach and communication. More information on the species management plan can be found online at www.invasivespeciescouncil.com. It is reasonable to assume that both Emerald Ash Borer and Hemlock Woolly Adelgid will continue to have a presence in Lawrence County.

4.3.6.5 Vulnerability Assessment

Lawrence County's exact vulnerability will depend on the invasive species in question. In general, though, the National Invasive Species Information Center has identified the following characteristics of areas that are more likely to be invaded:

- Lack of natural predators or diseases that kept the species under control in its native environment
- Present vacant ecological niches that can be exploited by non-native species
- Generally lacking in species diversity
- Lack of a multi-tiered canopy (in the case of invasive plants)

Due to the current presence of invasive species it is clear that the county is vulnerable to invasive species. Lawrence County is in an active zone in the Commonwealth that is vulnerable to invasive species. Due to the instances and extent of the current infestation, it is reasonable to project that the county's vulnerability will increase.

4.3.7. Landslides/Subsidence

4.3.7.1 Location and Extent

According to the United States Geological Survey (USGS), landslides are major geologic hazards that occur in all 50 states, cause $1-2 billion in damages and result in an average of more than 25 fatalities each year. (USGS, 1997) Landslides often occur with other natural hazards such as earthquakes and floods.

A landslide is the downward and outward movement of slope-forming soil, rock and vegetation reacting to the force of gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes and changes in groundwater levels. Mudflows, mudslides, rock falls, rockslides and rock topples are all forms of a landslide. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed

hillsides and areas recently burned by forest and brush fires. (Delano & Wilshusen, 2001).

Subsidence is a natural geologic process that commonly occurs in areas with underlying limestone bedrock and other rock types that are soluble in water. Water passing through naturally occurring fractures dissolves these materials leaving underground voids. Eventually, overburden on top of the voids causes a collapse which can damage structures with low strain tolerances. This collapse can take place slowly over time or quickly in a single event. Karst topography describes a landscape that contains characteristic structures such as sinkholes, linear depressions and caves.

Few areas in Lawrence County, due to the topography of the terrain, are particularly susceptible to landslides. The prime areas in Lawrence County that are susceptible to mine subsidence are in Neshannock and Union Townships. An area of Perry Township in the vicinity of Wurtemburg on Route 488 has experienced subsidence. Residents and the business infrastructure in that area have been affected. Subsidence from mines in the Harlansburg area can affect the population in the community. An area along SR 108 in North Beaver Township has experienced mine subsidence as well.

4.3.7.2 Range of Magnitude

Landslides cause damage to transportation routes, utilities and buildings and create travel delays and other side effects. Fortunately, deaths and injuries due to landslides are rare in Pennsylvania. Almost all of the known deaths due to landslides have occurred when rock falls or other slides along highways have involved vehicles. Storm induced debris flows are the only other type of landslide likely to cause death and injuries. As residential and recreational development increases on and near steep mountain slopes, the hazard from these rapid events will also increase. Most Pennsylvania landslides are moderate to slow moving and damage things rather than people.

Subsidence may be natural, or related to mining activities. Areas mined for coal or other minerals that use deep mining techniques may become susceptible to subsidence. Poor engineering practices at the time of withdrawal, or progressive degradation in geological stability contributes to subsidence and constitutes a potential threat to people living in those areas. Isolated incidents throughout the coal regions have included houses, garages and trees being swallowed by subsidence sinkholes. Portions of local streets, highways and countless building foundations have been damaged in the Commonwealth.

Natural subsidence results from what are considered to be normal geological processes particular to certain landforms. In Pennsylvania, water movement through carbonate terrain, i.e., limestone and dolomite, may result in topographical features such as swales, sinkholes and other forms of subsidence.

As Lawrence County has had no major incidents of landslides in the past, the range of magnitude of the impacts of such occurrences is not applicable.

4.3.7.3 Past Occurrence

There have been no documented reports of any major landslides in Lawrence County that have resulted in death or property damage, although minor landslides have occurred. In 1988, Taylor Township experienced a minor landslide due to an excessive amount of rain. Also, according to the Pennsylvania Emergency Incident Reporting System (PEIRS), the following geological emergencies were reported.

Table 22 - Landslides

Landslides/Subsidence that Have Occurred in Lawrence County				
Date	**Road**	**Municipality**	**Segment/Offset Location**	**Hazard**
05/18/07	McCartney Hollow Road	Perry Township		Landslide
08/21/07	Round St. & W. Washington St. (Culvert)	Union Township		Sinkhole from flooding
02/27/11	Unknown	Perry Township		Rock slide
05/28/14	Mount Jackson Road (SR 108)	North Beaver Township		Mine subsidence
06/01/15	SR 108	North Beaver Township	100' x 200' in diameter by approximately 3' deep	Mine subsidence

4.3.7.4 Future Occurrence

There is very little chance of a major landslide occurring in Lawrence County. Minor events have occurred in Lawrence County in the past and will continue to occur in the future.

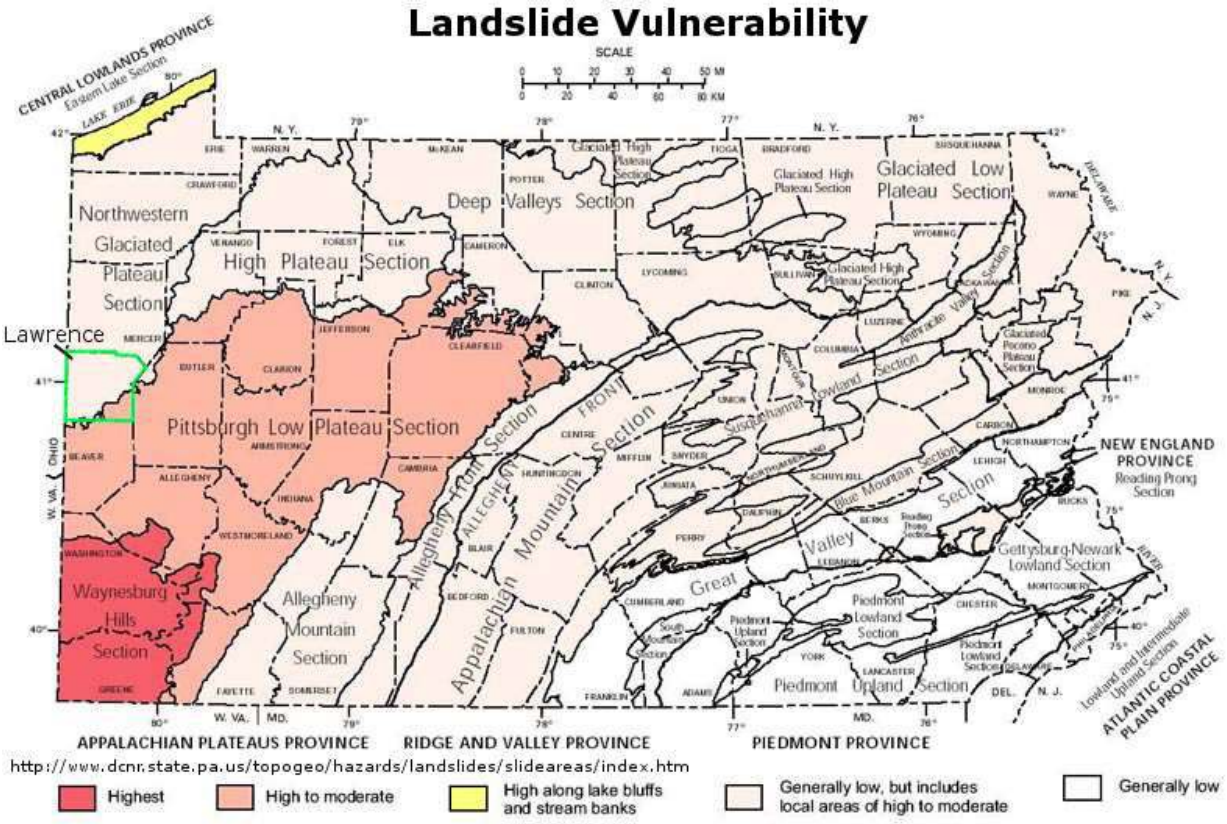
A particular section of Neshannock Township that is susceptible to mine subsidence is the area from Plank Road East to Meadow Lane on Shenango and Greenfield Roads. In North Beaver Township along SR 108 is an area of concern with mine subsidence. These areas are the primary locations for possible future occurrences.

A risk factor of 1.6 has been assigned to this hazard utilizing the risk factor assessment tool.

4.3.7.5 Vulnerability Assessment

Some measures do exist to lessen the dangers of landslides. These measures include the storm water management plan and local ordinances (zoning and subdivision, etc.) that place limitations on construction or development, monitoring construction practices; prepare studies of slide prone areas, erosion protection measures and drainage considerations. A basic rule of thumb is to know where landslide areas exist and to avoid building on, through or near them (leave them undisturbed). Worst case scenario would be major landslide total damages could exceed 1 million dollars.

Figure 18 - Landslide Vulnerability Map



4.3.8. Lightning Strike

4.3.8.1 Location and Extent

Lightning is a massive electrostatic discharge between electrically charged regions within clouds, or between a cloud and the Earth's surface. The charged regions within the atmosphere temporarily equalize themselves through a lightning flash, commonly referred to as a strike if it hits an object on the ground. There are three primary types; from a cloud to itself (intra-cloud or IC); from one cloud to another cloud (CC) and finally between a cloud and the ground (CG). Although lightning is always accompanied by the sound of thunder, distant lightning may be seen but be too far away for the thunder to be heard.

Lightning occurs approximately 40–50 times a second worldwide, resulting in nearly 1.4 billion flashes per year.

Lawrence County is subject to lightning strikes and thunderstorm activity throughout the year. Overall the most active time for lightning strikes is from early spring to early fall seasons. While the impact of flash events is highly localized, strong storms can result

in numerous widespread events over a broad area. In addition, the impacts of an event can be serious or widespread if lightning strikes a particularly significant location such as a power station or large public venue.

4.3.8.2 Range of Magnitude

Severe thunderstorms can cause significant damage and can be life threatening. While thunderstorms can kill with lightning, severe thunderstorms can also produce large hail and damaging winds. Only a small percent of thunderstorms become severe. Downbursts from severe thunderstorms can have winds as high as 168 mph but most range from 60-80 mph. Lawrence County gets 25 to 32 days per year with lightning. Lightning can cause severe injury and is fatal in some cases. Deaths and injuries to livestock and other animals, thousands of forest and brush fires, as well as millions of dollars in damage to buildings, communications systems, power lines and electrical systems are also the result of lightning.

4.3.8.3 Past Occurrence

Table 23 - Annual Lightning Strikes

Lawrence County Annual Lightning Strikes	
Year	**Lightning Strikes**
1995	57
1996	1112
1997	74
1998	82
1999	152
2000	201
2001	124
2002	77
2003	114
2004	208
2005	178
2006	266
2007	185
2008	175
2009	136
2010	183
2011	227
2012	335
2013	262
2014	392
2015	1180
Source: National Climatic Data Center	

Thunderstorms and lightning occur many times each year. Lightning has been responsible for 11 deaths and 312 injuries in Pennsylvania between the years of 2003-2012. Pennsylvania is ranked 26th in the United States of cloud-to-ground flash densities. During 2012 the National Lightning Detection Network (NLDN) recorded 393,759 cloud-to-ground flashes. *Table 23 - Annual Lightning Strikes* outlines the annual lightning strikes for Lawrence County.

4.3.8.4 Future Occurrence

Lightning strikes and thunderstorms are expected during and around the spring and summer months. These events have occurred in Lawrence County in the past and will continue to occur in the future, although multiple casualties or deaths are highly unlikely. A risk factor of 2.2 has been assigned to this hazard utilizing the risk factor evaluation tool.

4.3.8.5 Vulnerability Assessment

The potential for lightning strikes and thunderstorms exists in all municipalities in Lawrence County. Events being held outdoors during the summer months are particularly vulnerable to lightning strikes. Due to the recreational

land use in the Lawrence County and waterways in Lawrence County the potential for death or injury is ever present.

4.3.9. Pandemic and Infectious Disease

4.3.9.1 Location and Extent

A pandemic is a disease that attacks or affects the population of an extensive area. This is sometimes an entire country or continent. Each year, different strains of influenza are labeled as potential pandemic threats, for example. Although brought under control in 2004, 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.

4.3.9.2 Range of Magnitude

Advancements in medical technologies have greatly reduced the number of deaths caused by influenza over time. The impact various pandemic influenza outbreaks have had globally over the last century has declined. The severity of illness from the 2009 H1N1 influenza flu virus has varied greatly, with the gravest cases occurring mainly among those considered at high risk. High risk populations considered more vulnerable are described in Section 4.3.9.5. Most people infected with swine flu in 2009 have recovered without needing medical treatment. However, the virus has resulted in many deaths, including fourteen in Pennsylvania as of December 2009. According to the CDC about 70% of those who had been hospitalized with the 2009 H1N1 flu virus in the United States belonged to a high risk group (CDC, 2009).

The worst case scenario for Lawrence County would be the outbreak of a widespread pandemic that would affect not only the higher at-risk groups, but the entire population.

Table 24 - Congregated Populations

Congregated Populations	
Location	**Number of Beds**
Jameson Hospital North	254
Ellwood City Hospital	62
Total	**316**

While there are limited secondary hazards related to public health emergencies, an outbreak could cause a variety of general secondary effects. Civil disorder is the most likely hazard to result from a public health emergency. Further potential secondary effects could include a shortage of medical supplies and personnel; school, business and government closings; and low attendance at places of employment, as well as slowed productivity.

The 2010 Hazard Mitigation Plan for Lawrence County listed the following concerns:

Influenza – More commonly known as the “flu”, is an infectious disease of birds and mammals caused by RNA viruses. The flu can lead to pneumonia, even for person who are usually very healthy. Typically influenza is transmitted through the air by coughs

or sneezes. It can also be transmitted by direct contact with bird droppings or nasal secretions, or through contact with contaminated surfaces. Yearly, influenza spreads around the world in seasonal epidemics, resulting in about three to five million cases of severe illness yearly; and approximately 250,000 to 500,000 deaths.

Smallpox – This was an infectious disease unique to humans, caused by either of two virus variants, *Variola major* and *Variola minor*. The last naturally occurring case of smallpox (*Variola* minor) was diagnosed in October 1977. *Variola major* is the more severe and has an overall mortality rate of 30 to 35 percent. Variola minor only has a mortality rate of 1 percent. Long-term complications of Variola major include characteristic scars. Less common complications are blindness and limb deformities due to arthritis and osteomyelitis.

West Nile Virus – Is found in temperate and tropical regions of the world and is a mosquito-borne zoonotic arbovirus. It was first identified in the West Nile sub-region in the East African nation of Uganda in 1937. It was considered a minor risk to humans until an outbreak in Algeria in 1994. At that time there were cases of West Nile Virus that caused encephalitis. The virus has spread globally. In 2012 West Nile Virus killed 286 people in the United States.

Most of the West Nile virus infections in humans are subclinical, which cause no symptoms. In the approximately 20 percent of infections to humans where symptoms do occur, the time from infection to appearance of symptoms is between 2 to 15 days. Less than 1 percent of the cases are severe and result in neurological disease. Currently there is no vaccine against West Nile virus infection.

4.3.9.3 Past Occurrence

Influenza

Table 25 - Past Outbreaks

Past Outbreaks and Pandemics of Influenza			
Year/Time Frame	**Known as:**	**Virus Type**	**Geographic Origin**
1889	Russian flu	H2N2 or H3N8	Russia
1918	Spanish flu	H1N1	German, Britain, France and the United States
1957	Asian flu	H2N2	China
1968-1969	Hong Kong flu	H3N2	Hong Kong
1976	Swine flu	H1N1	Fort Dix “swine flu fiasco”
2006	H5N1	H5N1	India
2007	Australian equine	H3N8	Australia
2007	Bernard Matthews	H5N1	England – Bernard Matthews’ farms
2008	West Bengal	H5N1	West Bengal, India
2009	Novel H1N1	H1N1	Mexico

Table 26 - Common Virus Names

Common Names for Viruses	
Virus	**Common Name**
H1N1	Human, swine, bird
H2N2	bird
H5N1	"bird flu"
H3N8	Canine (dog flu), equine-2
H7N7	Equine-1 (horse flu)
H7N9	Avian (bird flu)

Lawrence County was impacted with the H1N1 virus during 2009. A comprehensive network has been developed in Pennsylvania includes trapping mosquitoes, collecting dead birds and monitoring horses, people and in past years sentinel chickens.

Smallpox – The World Health Organization (WHO) certified the eradication of smallpox in 1979. This is due to the vaccination campaigns throughout the 19th and 20th centuries.

West Nile virus – The West Nile virus has been found in the mosquito populations in the county. However, there have been no reports of incidents involving the human population within Lawrence County.

4.3.9.4 Future Occurrence

A possible probability of a widespread pandemic public health emergency is every 10 years or less with varying degrees of severity. Minor outbreaks of less serious communicable disease such as influenza occur much more frequently. Lawrence County is vulnerable to these diseases and infections since people commute from the larger urban areas to the county for recreation and sport related activities. As well as, Lawrence County residents that commute to larger urban areas for employment.

In China, health officials urged health care workers to prepare for the possible re-emergence of the deadly H7N9 bird flu in the fall of 2013. This virus has killed one-third of the patients hospitalized. Researchers suggested that the H7N9 is deadlier than the 2009 H1N1 swine flu virus. These cases coincided with the arrival of cooler weather in China and were not unexpected. Most of the cases that were reported had poultry exposure and lived in areas where H7N9 had been found previously. As of mid-January 2014, cases continue to be reported and the frequency of these reports has increased. Although epidemiological investigations are ongoing for some of the more recent cases, currently no evidence has been found that indicates sustained human-to-human transmission is occurring.

Smallpox – Any smallpox outbreak would be considered an act of terrorism.

4.3.9.5 Vulnerability Assessment

The probability of a pandemic even occurring in Lawrence County is unlikely. However, it is extremely difficult to predict a 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 to 35 percent of the U.S. population could be affected by an influenza pandemic and the economic impact could range from $71.3 to $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 to 12 months after the first wave). The numbers of healthcare 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 healthcare 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.

4.3.10. Radon Exposure

4.3.10.1 Location and Extent

Radioactivity caused by airborne radon has been recognized for many years as an important component in the natural background radioactivity exposure of humans, but it was not until the 1980s that the wide geographic distribution of elevated values in houses and the possibility of extremely high radon values in houses were recognized. In 1984, routine monitoring of employees leaving the Limerick nuclear power plant near Reading, Pennsylvania showed that readings on Mr. Stanley Watras frequently exceeded expected radiation levels, yet only natural, non-fission-product radioactivity was detected on him. Radon levels in his home were detected around 2,500 pCi/L (pico Curies per Liter), much higher than the 4 pCi/L guideline of the Environmental Protection Agency (EPA) or even the 67 pCi/L limit for uranium miners.

As a result of this event, the Reading Prong section of Pennsylvania where Watras lived became the focus of the first large-scale radon scare in the world. Radon is a noble gas that originates by the natural radioactive decay of uranium and thorium. Like other

noble gases (e.g., helium, neon and argon), radon forms essentially no chemical compounds and tends to exist as a gas or as a dissolved atomic constituent in groundwater.

Two isotopes of radon are significant in nature, 222Rn and 220Rn, formed in the radioactive decay series of 238U and 232Th, respectively. The isotope thoron (i.e. 220Rn) has a half-life (time for decay of half of a given group of atoms) of 55 seconds, barely long enough for it to migrate from its source to the air inside a house and pose a health risk. However, radon (i.e. 222Rn), which has a half-life of 3.8 days, is a widespread hazard. The distribution of radon is correlated with the distribution of radium (i.e. 226Ra), its immediate radioactive parent and with uranium, its original ancestor. Due to the short half-life of radon, the distance that radon atoms can travel from their parent before decay is generally limited to distances of feet or tens of feet.

Three sources of radon in houses are now recognized: Radon in soil air that flows into the house; Radon dissolved in water from private wells and exsolved during water usage; this is rarely a problem in Pennsylvania; and Radon emanating from uranium-rich building materials (e.g. concrete blocks or gypsum wallboard); this is not known to be a problem in Pennsylvania.

4.3.10.2 Range of Magnitude

Exposure to radon is the second leading cause of lung cancer after smoking. It is the number one cause of lung cancer among non-smokers. Radon is responsible for about 21,000 lung cancer deaths every year; approximately 2,900 of which occur among people who have never smoked. Lung cancer is the only known effect on human health from exposure to radon in air and thus far, there is no evidence that children are at greater risk of lung cancer than are adults (USEPA, 2010). The main hazard is actually from the radon daughter products (218Po, 214Pb, 214Bi), which may become attached to lung tissue and induce lung cancer by their radioactive decay.

4.3.10.3 Past Occurrence

Current data on abundance and distribution of radon in Pennsylvania houses is considered incomplete and potentially biased, but some general patterns exist. Values exceeding the EPA guideline of 4 pCi/L occur in all regions of the Commonwealth. Glaciated areas in northern Pennsylvania tend to have relatively low frequencies of elevated radon, perhaps because of thin soils and incomplete weathering. The Appalachian Plateaus province in western Pennsylvania also appears to have lower than average radon, as does the Atlantic Coastal Plain near Philadelphia and other areas having a shallow water table. The highest proportion of elevated values is in a zone extending from central Pennsylvania to southeastern Pennsylvania and in the Reading Prong. High values in the latter area are attributed to known uranium-rich granitic gneisses (Smith, 1976; Gunderson et al., 1988), accentuated by local factors such as shear zones and include a surprising number of extremely high radon values (>200 pCi/L). Elevated radon values in the larger, northwest-southeast trending zone are not understood, but may represent

some combination of black shale (Martinsburg Formation), limestone soil and deep weathering. Information average radon levels by zip code in Pennsylvania can be obtained from the DEP at: *http://www.dep.state.pa.us/RadiationProtection_Apps/Radon/*

4.3.10.4 Future Occurrence

Radon exposure is inevitable given present soil, geologic and geomorphic factors across Pennsylvania. Development in areas where previous radon levels have been significantly high will continue to be more susceptible to exposure. However, new incidents of concentrated exposure may occur with future development or deterioration of older structures. Exposure can be limited with proper testing for both past and future development and appropriate mitigation measures. A risk factor of 2.5 has been assigned to this hazard utilizing the risk factor assessment tool.

4.3.10.5 Vulnerability Assessment

According to the EPA 1993 Pennsylvania Radon Zones, Lawrence County falls in to Zone 2 which has a moderate potential for Radon exposure. *Figure 19 - Pennsylvania Radon Zones* identifies each county in Pennsylvania and the potential for radon exposure. *Figure 20 - 4 Curies per Liter and Above Percentage Zip Code Map* identifies by zip code the percentage above the minimum exposure threshold of 4 pCi/L.

Figure 19 - Pennsylvania Radon Zones

	Zone 1 counties have a predicted average indoor radon screening level greater than 4 pCi/L (pico curies per liter) **(red zones)**	**Highest Potential**
	Zone 2 counties have a predicted average indoor radon screening level between 2 and 4 pCi/L **(orange zones)**	**Moderate Potential**
	Zone 3 counties have a predicted average indoor radon screening level less than 2 pCi/L **(yellow zones)**	**Low Potential**

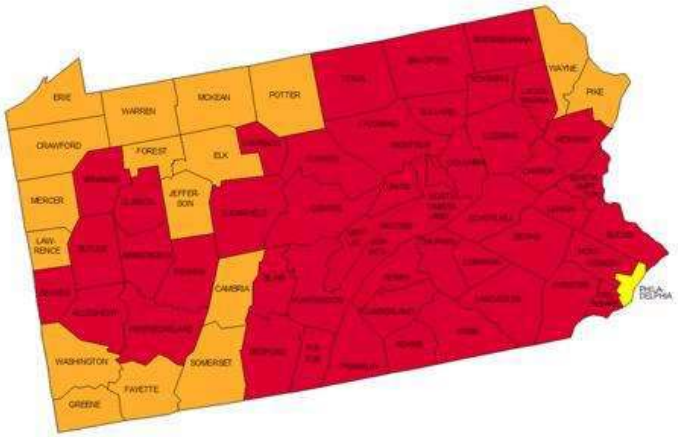
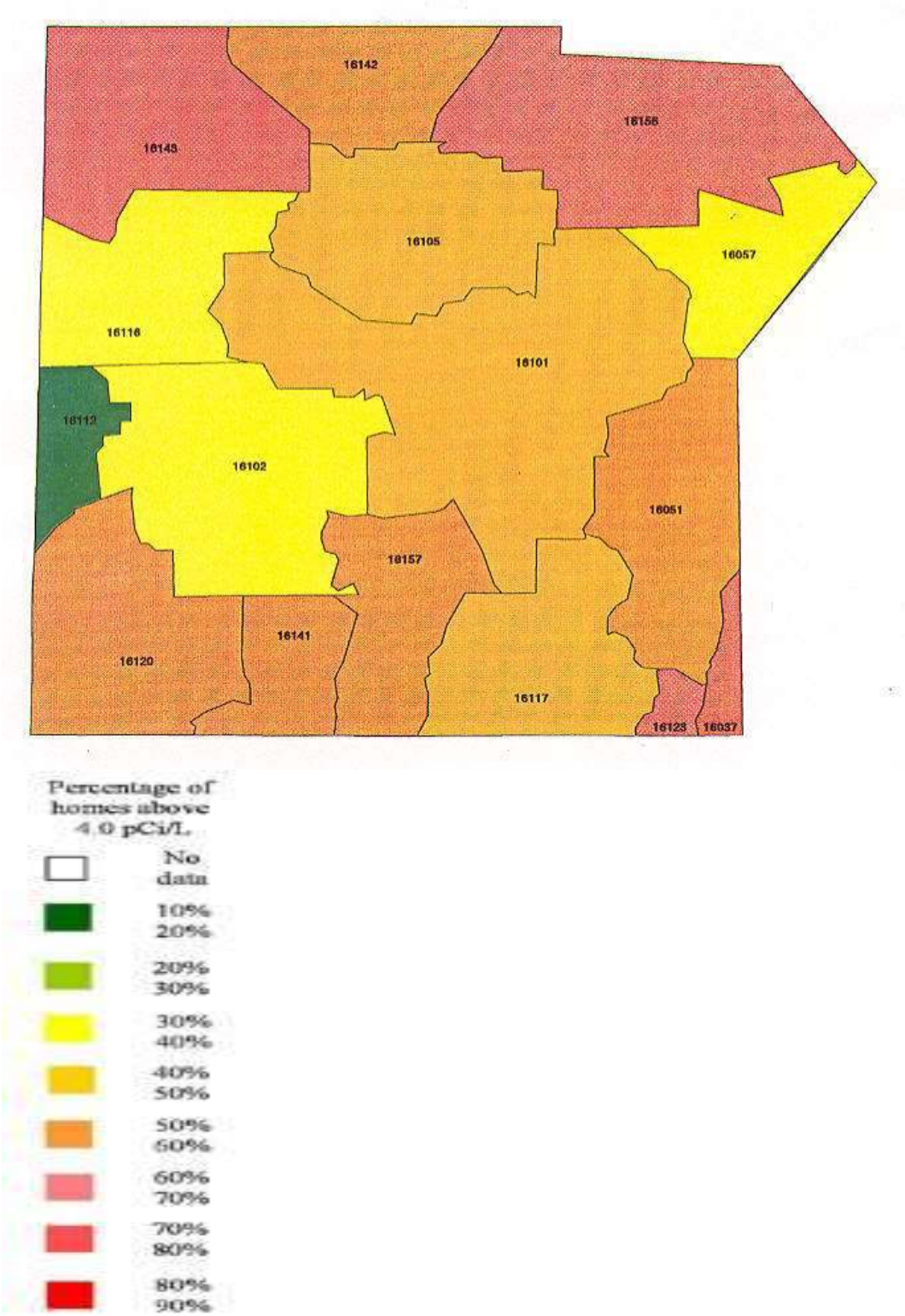


Figure 20 - 4 Curies per Liter and Above Percentage Zip Code Map



www.wpb-radon.com/PA_radon_map.html

4.3.11. Tornados and Windstorms

4.3.11.1 Location and Extent

Tornados

Tornados may occur in the Commonwealth during the spring and summer months. In the past 125 years, records show that about 250 Tornados have been reported in 58 of the 67 counties in Pennsylvania. The National Weather Service estimates the Commonwealth will experience 10 tornados annually.

As stated by the National Climatic Data Center (NCDC), wind speeds in tornados range from values below that of hurricane speeds to more than 300 miles per hour. The NCDC continues by reporting that, "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 and 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.

Windstorms

Windstorms are more frequent with thunderstorms than with hurricanes or tornados in Western Pennsylvania. A microburst is a very-localized column of sinking air, capable of producing damaging opposing and straight-line winds at the surface.

Figure 21 - Microburst Illustration

Microburst

The air moves downward until at ground level. It then spreads outward in all directions

A wind sheer is usually found when a violent weather front is moving through; wind speeds have been recorded up to 100 mph. Wind Sheer is defined as a difference in wind speed and direction over a relatively short distance in the atmosphere.

4.3.11.2 Range of Magnitude

While it is difficult to pinpoint the exact locations at the greatest risk of a tornado, the southeast, southwest and northwest sectors of the Commonwealth are more prone to tornados. Lawrence County lies in the West Central Pennsylvania. Tornados can have varying secondary effects. The most common is power failure. The severe wind strength can dismantle power sources. Structural damage can also be significant. Hazardous material spills can occur if a tornado comes near a holding tank, or the spill stems from a traffic accident caused by high winds.

Windstorms of all types have caused the following problems within Lawrence County:

- Power failures lasting 4 hours or longer
- Loss of communications networks lasting 4 hours or more
- Residents requiring evacuation or provision of supplies or temporary shelter
- Severe crop loss and or damage

Tornados are measured on the Enhanced Fujita Scale by focusing on their wind speed. This scale is shown below in *Table 27 - Enhanced Fujita Scale*.

Table 27 - Enhanced Fujita Scale

Enhanced Fujita Scale (EF-Scale) Categories with Associated Wind Speeds and Description of Damages.			
EF-SCALE NUMBER	**WIND SPEED (mph)**	**F-SCALE NUMBER**	**TYPE OF DAMAGE POSSIBLE**
EF0	65–85	F0-F1	**Minor damage**: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornados with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	F1	**Moderate damage**: Roofs severely stripped; mobile homes over-turned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111–135	F1-F2	**Considerable damage**: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136–165	F2-F3	**Severe damage**: Entire stories of well-constructed houses de-stroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166–200	F3	**Devastating damage**: Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	F3-F6	**Extreme damage**: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (300 ft.); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

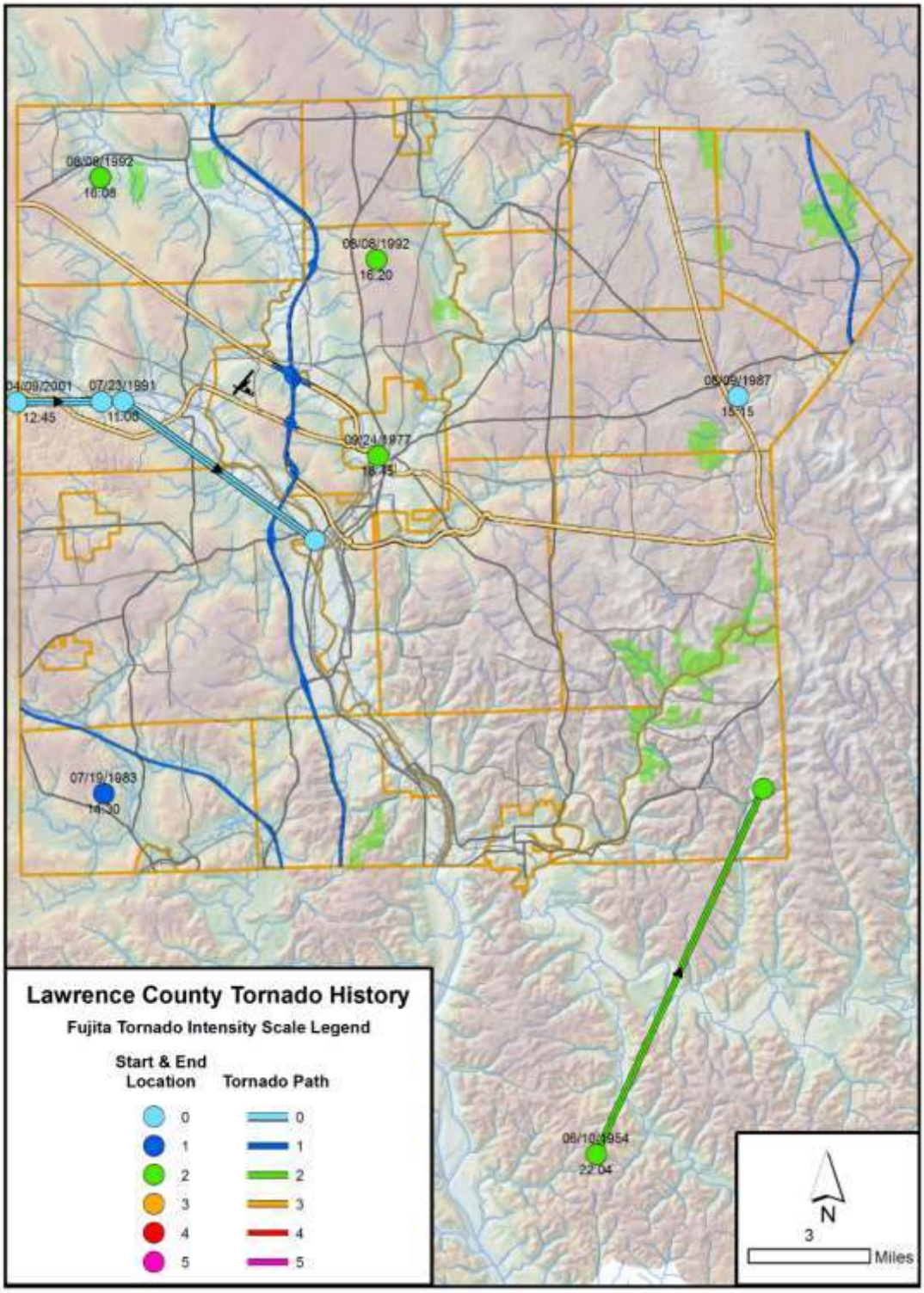
4.3.11.3 Past Occurrence

Lawrence County has witnessed eleven tornados since 1950. *Table 28 - Tornado History* outlines previous tornados in Lawrence County.

Table 28 - Tornado History

Tornado History for Lawrence County				
Date	**Time**	**Fujita Scale**	**Injuries**	**Deaths**
06/10/54	2220	F2	2	0
09/24/77	1845	F2	0	0
07/19/83	1430	F1	0	0
08/09/87	1515	F0	0	0
07/22/90	1558	F0	0	0
07/23/91	1100	F0	0	0
07/12/92	2145	F0	0	0
08/08/92	1708	F2	11	0
08/08/92	1720	F2	0	0
04/09/01	1345	F0	0	0
07/10/13	1542	EF1	0	0

Figure 22 - Lawrence County Tornados



Windstorms

Table 29 - Windstorm History outlines the history of the windstorm incidents in Lawrence County from 2006-2014.

Table 29 - Windstorm History

Windstorms in Lawrence County from 2006 to 2014				
Date	**Type**	**Location**	**Types of Damages**	**Damage Totals**
06/22/06	Windstorm	Volant	Trees down, power/utility outages	
07/30/06	Thunderstorm/Wind	New Castle	Trees down	
06/08/07	Thunderstorm/Wind	New Bedford	Trees down	
06/08/07	Thunderstorm/Wind	Volant	Trees down, power/utility outages	$3,000.00
06/08/07	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$3,000.00
06/08/07	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	
06/27/07	Windstorm	New Castle	Trees down, power/utility outages	
07/27/07	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$15,000.00
08/09/07	Thunderstorm/Wind	Duck Run	Trees down, power/utility outages	
08/09/07	Thunderstorm/Wind	Pleasant Hill	Trees down, power/utility outages	$10,000.00
08/23/07	Thunderstorm/Wind	Pleasant Hill	Trees down, power/utility outages	$20,000.00
06/13/08	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$75,000.00
06/13/08	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$50,000.00
06/29/08	Thunderstorm/Wind	New Wilmington	Trees down, power/utility outages	$75,000.00
07/22/08	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$25,000.00
05/28/09	Thunderstorm/Wind	Duck Run	Trees down, power/utility outages	$50,000.00
08/10/09	Thunderstorm/Wind	New Wilmington	Trees down, power/utility outages	$50,000.00
08/10/09	Thunderstorm/Wind	MC Oaslin	Trees down, power/utility outages	$50,000.00
05/11/10	Thunderstorm/Wind	New Wilmington	Trees down, power/utility outages	$15,000.00
07/17/10	Thunderstorm/Wind	New Wilmington	Trees down, power/utility outages	$10,000.00
07/17/10	Thunderstorm/Wind	Brent	Trees down, power/utility outages	$25,000.00
07/23/10	Windstorm	Wilmington Jnct	Trees down, power/utility outages	$20,000.00
07/23/10	Thunderstorm/Wind	Mc Oaslin	Trees down, power/utility outages	$25,000.00
07/23/10	Thunderstorm/Wind	Walford	Trees down, power/utility outages	$25,000.00
07/24/10	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$5,000.00
10/26/10	Thunderstorm/Wind	Volant	Trees down, power/utility outages	$50,000.00
05/25/11	Thunderstorm/Wind	East Brook	Trees down, power/utility outages	$5,000.00
05/25/11	Thunderstorm/Wind	Neshanock Falls	Trees down, power/utility outages	$5,000.00
05/25/11	Thunderstorm/Wind	Harlansburg	Trees down, power/utility outages	$5,000.00
07/22/11	Thunderstorm/Wind	New Wilmington	Trees down, power/utility outages	$20,000.00
07/22/11	Thunderstorm/Wind	Ellwood City	Trees down, power/utility outages	$5,000.00
08/25/11	Thunderstorm/Wind	Walmo	Trees down, power/utility outages	$50,000.00
11/14/11	Thunderstorm/Wind	Walford	Trees down, power/utility outages	$15,000.00
11/14/11	Thunderstorm/Wind	Lawrence Jnct	Trees down, power/utility outages	$25,000.00
11/14/11	Thunderstorm/Wind	East New Castle	Trees down, power/utility outages	$25,000.00
11/14/11	Thunderstorm/Wind	Pleasant Hill	Trees down, power/utility outages	$15,000.00
05/27/12	Thunderstorm/Wind	Wampum	Trees down, power/utility outages	$25,000.00
07/03/12	Thunderstorm/Wind	Ellport	Trees down, power/utility outages	$25,000.00
07/07/12	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$50,000.00
07/26/12	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$15,000.00
08/08/12	Thunderstorm/Wind	Enon	Trees down, power/utility outages	$5000.00
08/08/12	Thunderstorm/Wind	Mountair	Trees down, power/utility outages	$1000.00
08/09/12	Thunderstorm/Wind	MCOaslin	Trees down, power/utility outages	$1000.00
08/09/12	Thunderstorm/Wind	MCOaslin	Trees down, power/utility outages	$3000.00

Windstorms in Lawrence County from 2006 to 2014				
Date	**Type**	**Location**	**Types of Damages**	**Damage Totals**
04/10/13	Thunderstorm/Wind	Pulaski	Trees down, power/utility outages	$2000.00
04/10/13	Thunderstorm/Wind	Plain Grove	Trees down, power/utility outages	$2000.00
04/10/13	Thunderstorm/Wind	Harbor Bridge	Trees down, power/utility outages	$2000.00
04/10/13	Thunderstorm/Wind	Robinson	Trees down, power/utility outages	$500.00
04/10/13	Thunderstorm/Wind	East New Castle	Trees down, power/utility outages	$500.00
04/10/13	Thunderstorm/Wind	Weigletown	Trees down, power/utility outages	$500.00
06/25/13	Thunderstorm/Wind	New Castle	Trees down, power/utility outages	$2000.00
06/25/13	Thunderstorm/Wind	Ellwood City	Trees down, power/utility outages	$2000.00
06/28/13	Thunderstorm/Wind	MC Oaslin	Trees down, power/utility outages	$2000.00
07/10/13	Thunderstorm/Wind	Coverdale	Trees down, power/utility outages	$25,000.00
07/10/13	Thunderstorm/Wind	Coverdale	Trees down, power/utility outages	$5000.00
07/10/13	Thunderstorm/Wind	Energy	Trees down, power/utility outages	$25,000.00
07/10/13	Thunderstorm/Wind	Weigletown	Trees down, power/utility outages	$25,000.00
07/23/13	Thunderstorm/Wind	Lawrence Jnct	Trees down, power/utility outages	$25,000.00
11/17/13	Thunderstorm/Wind	New Bedford	Trees down, power/utility outages	$25,000.00
Total				**$1.149 M**

4.3.11.4 Future Occurrence

The probability of a disastrous tornado hitting Lawrence County is ranked as possible. A risk factor of 2.4 has been assessed to this hazard utilizing the risk factor assessment tool. Eleven tornados have occurred in Lawrence County since 1950. Windstorms, straight line winds and winds associated with a severe thunderstorm occur on a more frequent basis. The local planning team ranked this hazard separate from tornados since the wind events occur more often in Lawrence County. The local planning team identified the probability of a windstorm event as highly likely. A risk factor of 2.8 has been assigned to this hazard utilizing the risk factor assessment tool.

4.3.11.5 Vulnerability Assessment

Tornados can occur at any time of the year, with peak months in the northern part of the United States during the summer. Tornados are most likely to occur between 3 P.M and 9 P.M. but have been known to occur at all hours of the day or night.

Other factors that impact the amount of damage caused by a tornado are the strength of the tornado, 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 tornados make them one of the most destructive natural hazards.

Other associated dangers that accompany thunderstorms that can produce tornados are:

- Flash floods – with 146 deaths annually nationwide
- Lightning – 75 to 100 deaths annually nationwide
- Damaging Straight-line winds – reaching 140 mph wind speed

- Large Hail – can reach the size of a grapefruit and causes several hundred million dollars in damages annually to property and crops.

The critical facilities of Lawrence County are highly vulnerable to tornados. While many severe storms can cause exterior damage to structures, tornados can completely destroy structures, along with surrounding infrastructure and abruptly halt operations. Severe storms often accompany tornados and can be just as threatening to the critical facilities within the county. Many secondary effects from these disasters can jeopardize the operation of these critical facilities as well. Power outages can leave facilities functionless, which can have a crippling effect on the infrastructure supporting the population of the county.

Tornados present a high social vulnerability in Lawrence County. With a storm's ability to destroy structures, citizens and their possessions are often left at the will of the storm. Numerous secondary effects can also spawn from tornados; among these, power outages, transportation accidents, hazardous material spills and flooding can be the most frequent. The special needs population is vitally at risk when faced with tornados. Without assistance to evacuate, they may be unable to prepare themselves or their homes and other possessions to safely weather the storm.

The economy of Lawrence County is highly vulnerable to tornados. While there may be limited impact on the financial and commercial systems of the economy, these storms and the damage they cause can disrupt business for the long term. The local economy can be crippled if buildings or supporting infrastructure are destroyed in the storm. The secondary effects of tornados can also take a toll on business. Power outages can create work stoppages while transportation accidents and road closings can limit the transportation of goods and services. Also, flooding cannot be discounted as it can destroy the physical structures, merchandise and equipment essential for business operation.

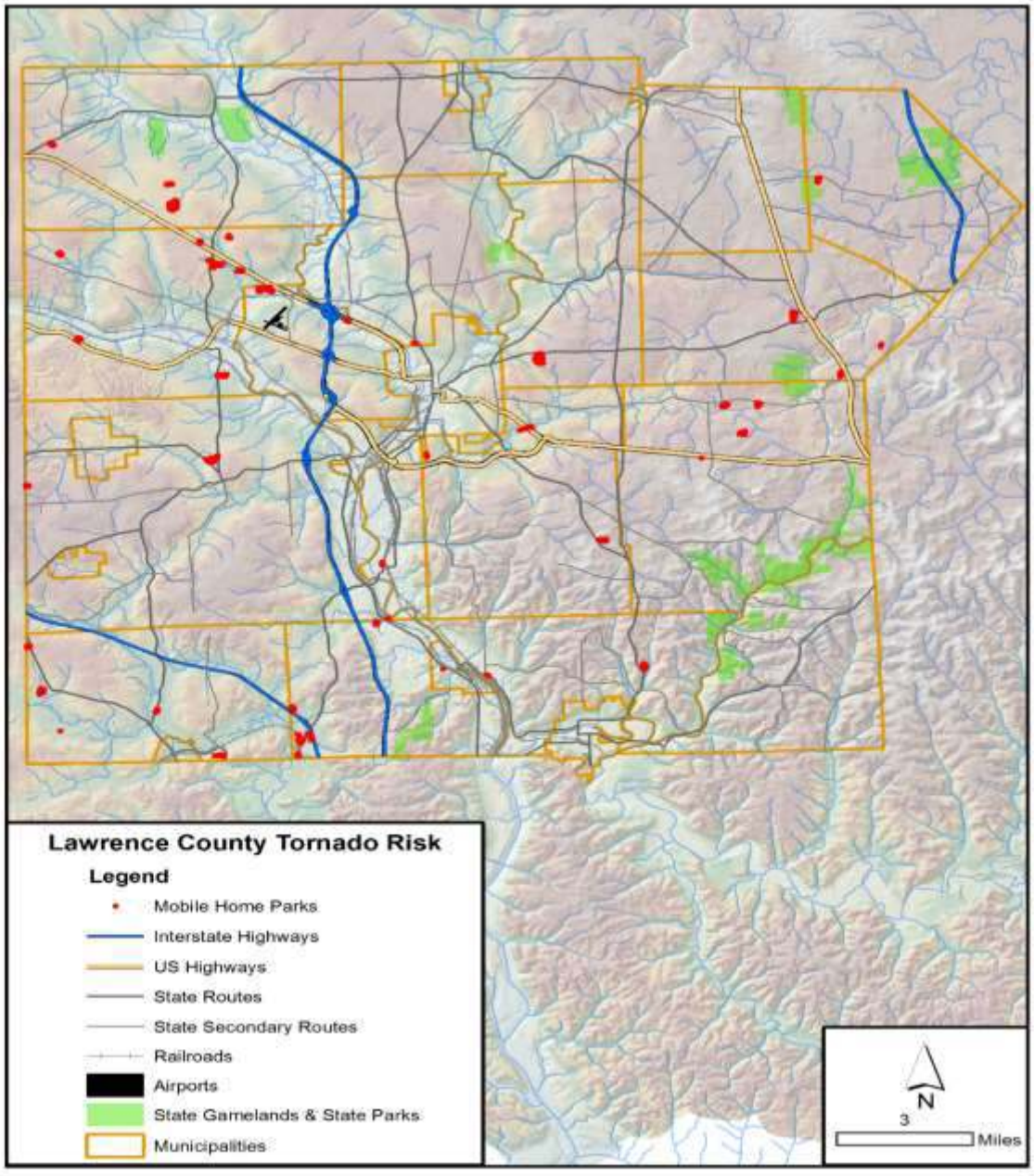
Lawrence County's environment is moderately vulnerable to tornados. Like many natural disasters, tornados alone will have little impact on the local ecosystems. However, similar to other hazards, secondary effects can impact the environment. Most notably, hazardous material spills can pollute ground water systems and vegetation. These situations often require extensive clean-up and mitigation efforts.

A proper warning system is vital for the public to be informed of what to do and where to go. Lawrence County is a rural county and with that comes tourism. Numerous hikers and hunters visit Lawrence County annually. In the event of a tornado or severe storm, these tourists have limited emergency notification measures.

Lawrence County is also highly vulnerable to windstorms. Power outages and blown down trees are the most likely secondary effect of these storms. The local planning team has identified windstorms to be more frequent than tornados. Windstorms have impacted critical infrastructure and closed vital state highways in the past.

Lawrence County is also more vulnerable economically to windstorms. Windstorms can impact tracts of hardwood and softwood lumber. At times, the storms can blow down large pockets of trees in a specific geographic area. The loss of these trees can be considered a financial loss to landowners and the lumber industry due to their value.

Figure 23 - Lawrence County Tornado Risk



4.3.12. Wildfire

4.3.12.1 Location and Extent

The most frequent causes of devastating wildfires are droughts, arson and human carelessness. Wildfires occur throughout wooded and open vegetation areas in Lawrence County. Small fires can rapidly escalate to large fires if undetected. Lawrence County is home to McConnell's Mills State Park and numerous acres of State Game Lands. These large wooded areas could be impacted with wildfires.

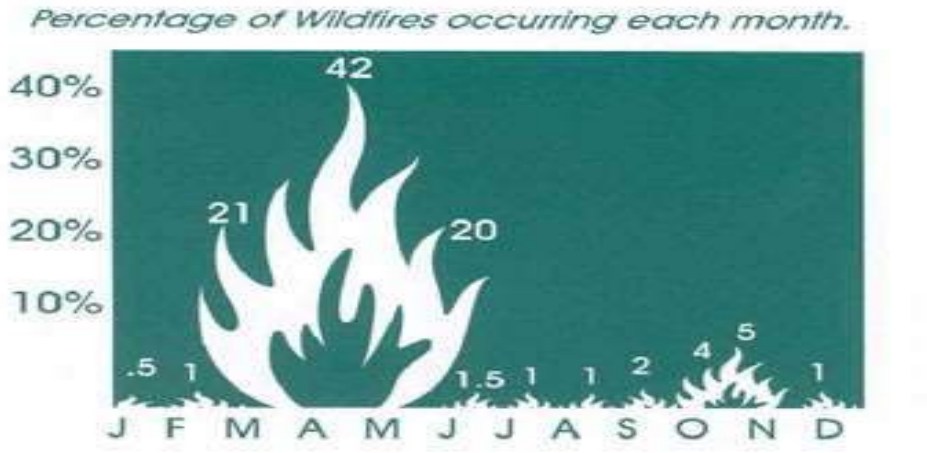
Wildfires take place in less developed or completely undeveloped areas, spreading rapidly through vegetative fuels. They can occur any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

Wildfires in Pennsylvania can occur in open fields, grass, dense brush and forests. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. The greatest potential for wildfires is in the spring months of March, April and May and the autumn months of October and November. In the spring, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris. In the fall, dried leaves are also fuel for fires. Ninety-eight percent of wildfires in Pennsylvania are caused by people, often by debris burns (DCNR, 2009). Several fires have started in a person's backyard and traveled through dead grasses and weeds into bordering woodlands.

During the drought of 1999, almost 8,500 acres of forests were burned in Pennsylvania. During the spring of 2001, 2,549 acres of Pennsylvania forests were burned. Pennsylvania will lose around 10,000 acres of forest land per year because of wildfires. Nationally, in 2003, wildfires burned five million acres in the United States (National Interagency Fire Center). Ninety two percent of Pennsylvania wildfires burn less than ten acres.

Figure 24 - Wildfire Percentage shows the wildfire percentage occurrence during each month occurring in Pennsylvania.

Figure 24 - Wildfire Percentage



Source: PA DCNR

4.3.12.2 Range of Magnitude

The forested areas of the county are at the greatest risk for wildfires. Lawrence County must be watchful of wildfires that could severely hinder farming, recreation, or industry. Wildfires usually occur following prolonged periods of dry weather; and with Lawrence County covered in forests, State Parks and game lands, a wildfire could prove to be costly.

If an urban fire or wildfire is not contained, certain secondary hazards may affect Lawrence County. Power outages may be the most prevalent of these hazards. Environmental hazards could also result from a wildfire or urban fire.

The United States Forest Service utilizes the Forest Fire Assessment System to classify the dangers of wildfire. *Table 30 - Wildland Fire Assessment* identifies each threat classification and provides a description of the level.

Table 30 - Wildland Fire Assessment

U.S. Forest Service – Wildland Fire Assessment System	
Low (L)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may bum freely a few hours after rain, but woods fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
Moderate (M)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.

High (H)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E)	Fires start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

4.3.12.3 Past Occurrences

The Pennsylvania Department of Conservation of Natural Resources (DCNR) Bureau of Forestry tracks forest fires by Forest Districts. Lawrence County is located in the Kittanning Forest District (D-8). According to DCNR, there were 56 fires within the Forest District 8 that burned 235.1 acres in 2013. Since the Kittanning Forest districts encompass more than just Lawrence County, it is unknown how many of these fires actually occurred in Lawrence County. No major forest fires have ever been recorded in Lawrence County.

Table 31 - Wildfire Summary

Lawrence County Summary of Wildfires						
Year	**Number of Incidents**	**Number of Burned Acres**	**Location**	**Cost to Extinguish**	**Estimated Timber & Property Loss**	**Number of Deaths**
1985	1	9	Unknown	$54	$1,248	0
1986	15	46	Unknown	$2,236	$17,508	0
1987	33	156	Unknown	$1,755	$14,871	0
1988	1	7	Unknown	$181	$739	0
1989	2	5	Unknown	$386	$526	0
1990	2	5	Unknown	$83	$99	0
1991	1	27	Unknown	$358	$2,722	0
1992	4	1	Unknown	$365	$4,583	0
1993	1	0	Unknown	$175	$9	0
1994-2006	0	0	Unknown	$0	$0	0
2007	2	Unavailable	Unknown	Unavailable	Unavailable	Unavailable
2008	2	Unavailable	Unknown	Unavailable	Unavailable	Unavailable
Note: Use $90 per acre unless other information is available. Information received from the Department of Environmental Resources, Forest Fire Protection Division November 1994						

Lawrence County Summary of Wildfires						
Year	**Number of Incidents**	**Number of Burned Acres**	**Location**	**Cost to Extinguish**	**Estimated Timber & Property Loss**	**Number of Deaths**
2009	3	Unavailable	Wayne Twp. North Beaver Twp. Slippery Rock Twp.	Unavailable	Unavailable	Unavailable
2010	2	Unavailable	Pulaski Twp. Wayne Twp.	Unavailable	Unavailable	Unavailable
2011	0	Unavailable	--	Unavailable	Unavailable	Unavailable
2012	1	Unavailable	North Beaver Twp.	Unavailable	Unavailable	Unavailable
2013	2	Unavailable	Shenango Twp. and unknown	Unavailable	Unavailable	Unavailable

** Data from 2009 to 2013 was obtained from the Lawrence County Knowledge Center™ log.*

Overall, the county is at a moderate to high risk for wildland fires. The table below details the areas that are most at risk from wildland fires as assessed by the Pennsylvania Bureau of Forestry. *Table 32 - Wildfire Risk* maps the fire hazard ranking shown below for each municipality. Almost all of the wildland fires in the county occur in remote areas or areas away from residential structures. Unlike the wildland fires that occur in other parts of the country and affect vast areas of land and residential areas, most of the fires in Lawrence County are contained before they cause any damage or extensive property loss.

Table 32 - Wildfire Risk

Wildfire Risk by Municipality				
Municipality	**Risk**	**Hazard**	**Value**	**Affected Acres**
Bessemer Borough	Medium	Low	Medium	1,070.13
Ellport Borough	Medium	Low	Medium	321.21
Ellwood City Borough	Low	Low	Low	1,335.79
Enon Valley Borough	High	Low	Medium	306.60
Hickory Township	High	High	High	10,321.62
Little Beaver Township	High	High	High	12,914.18
Mahoning Township	High	High	High	15,794.23
Neshannock Township	High	Medium	High	11,066.03
New Beaver Borough	High	Medium	High	9,279.38
New Wilmington Borough	Medium	Low	Medium	697.35
North Beaver Township	High	High	High	27,922.67
Perry Township	Unavailable	Unavailable	Unavailable	11,852.70

Wildfire Risk by Municipality				
Municipality	**Risk**	**Hazard**	**Value**	**Affected Acres**
Plain Grove Township	High	Medium	Medium	11,755.83
Pulaski Township	High	High	High	19,603.08
S.N.P.J. Borough	Low	Low	Low	480.15
Scott Township	High	High	High	12,620.76
Slippery Rock Township	High	High	High	15,697.59
South New Castle Borough	High	High	High	19,365.24
Taylor Township	Medium	Low	Medium	3,392.75
Union Township	High	Medium	Medium	6,162.19
Volant Borough	Medium	Low	Medium	67.82
Wampum Borough	Low	Low	Low	745.50
Washington Township	High	High	High	10,404.85
Wayne Township	High	Medium	High	10,392.60
Wilmington Township	High	High	High	13,185.35

Table 33 - Kittanning District Wildfires reflects the Kittanning District Reports from 2009-2013.

Table 33 - Kittanning District Wildfires

Statewide Wildfires in the Kittanning District, 2009-2013					
Year	**Lawrence District**	**Fires**	**% of State-wide**	**Acres**	**% of State-wide**
2009	Kittanning (D-8)	11	1.8%	85.0	1.4%
2010	Kittanning (D-8)	8	1.4%	274.4	8.1%
2011	Kittanning (D-8)	18	8.9%	96.4	16.6%
2012	Kittanning (D-8)	73	10.2%	102.9	3.2%
2013	Kittanning (D-8)	56	8.9%	235.1	13.2%

4.3.12.4 Future Occurrence

Wildfires have a possible probability of occurring on an annual basis. A risk factor of 2.3 has been assigned to the wildfire hazard utilizing the risk factor assessment tool provided by the Pennsylvania Emergency Management Agency.

No significant wildfires have occurred in Lawrence County's recorded history. Weather conditions play a major role in the occurrence of these wild fires. Dry conditions with decreased humidity are an ideal scenario for a wild fire.

The Lawrence County Department of Public Safety coordinates countywide burn bans when the conditions are ideal for wildfires. Public information and press releases are issued to help decrease the risk of a major fire thus reducing the possibility of future occurrences. Lawrence County DPS disseminates all red flag warnings.

4.3.12.5 Vulnerability

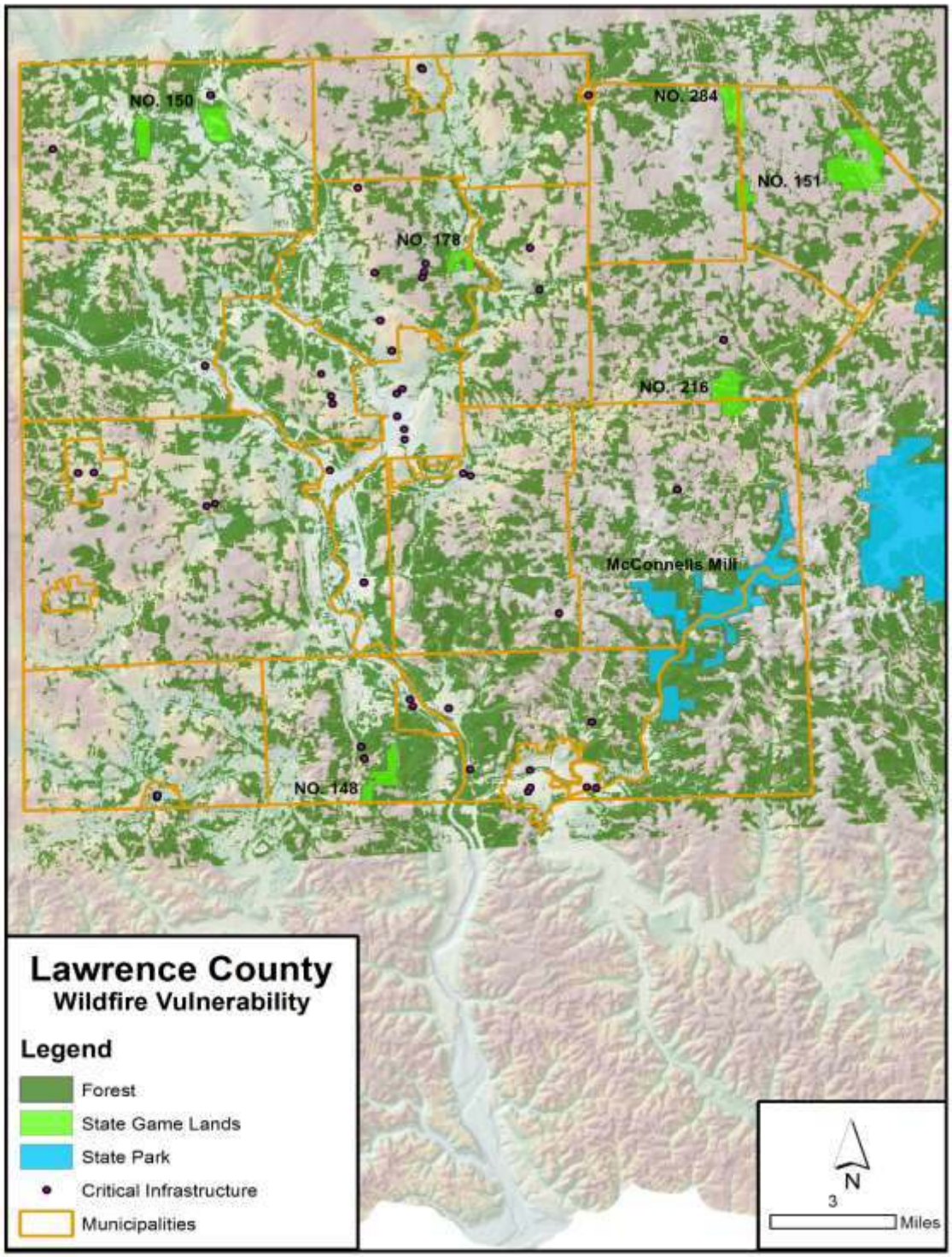
Although no significant wildfires have been recorded by the Pennsylvania Department of Conservation and Natural Resources – Bureau of Forestry (PA DCNR-BOF) and the National Climatic Data Center (NCDC) for Lawrence County, all areas of the county can be prone to wildfires. The size and impact of a wildfire 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. During a drought, wildfires can be devastating. Lightning strikes are another cause of wildfires. However, human carelessness and negligence remain as the leading factor.

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.

Firefighters and other first responders are vulnerable to forest fires. Traffic accidents during a response and then the impacts of fighting the fire once on scene are examples of the first responder vulnerabilities.

In accordance with the 2013 Pennsylvania Hazard Mitigation Plan, the Pennsylvania Department of Conservation of Natural Resources, Bureau of Forestry conducts jurisdictional assessments of wildfire hazards throughout the Commonwealth. The last analysis was completed in 2009 and was conducted with the best available information. Hazard is defined by fuel, topography and local weather which jurisdictions are most vulnerable to wildfires. Sixteen municipalities within Lawrence County are identified as high hazard classification.

Figure 25 - Wildfire Vulnerability Map

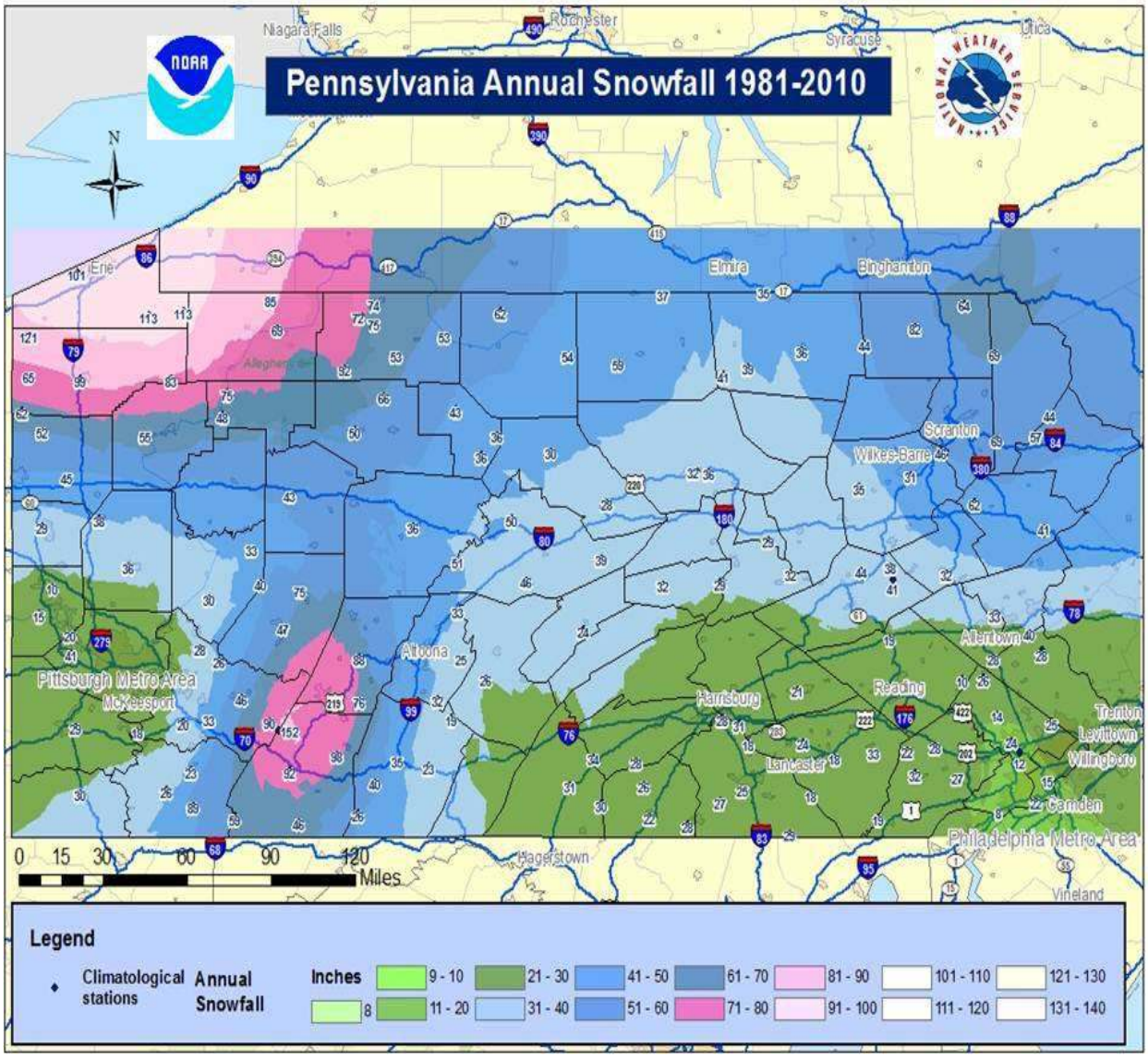


4.3.13. Winter Storms

4.3.13.1 Location and Extent

Winter storms with excessive snow and ice and frigid temperatures can occur on average five times a year in Lawrence County. Every county in Pennsylvania shares these hazards. However, the northern tier, western counties and mountainous regions seem to experience storms more frequently and with a greater severity. *Figure 26 - Annual* Snowfall shows the annual snowfall amounts for locations in Pennsylvania.

Figure 26 - Annual Snowfall



**National Weather Service*

4.3.13.2 Range of Magnitude

Winter storms are usually a countywide hazard. Winter storms consist of cold temperatures, heavy snow or ice, sleet and sometimes strong winds. Due to their regular occurrence, these storms are considered hazards only when they result in damage to specific structures or cause disruption to traffic, communications, electric power, or other utilities.

During the winter months about a fourth of the precipitation occurs in Lawrence County as snow; with about a chance of precipitation on any day. The snow fall is generally from late November to early April, with the greatest monthly amounts occurring in December and January. The month of March usually records the greatest individual storm amounts, as the moisture in the air increases.

Flooding and power outages are major secondary effects of winter storms and winter weather. Melting snow can lead to large amounts of ground water that cannot be contained by streams and creeks. Power outages can be caused by large amounts of snow or ice that weighs on power lines.

A winter storm can adversely affect roadways, utilities, business activities and can cause frostbite or loss of life. These storms may include one or more of the following weather events outlined in *Table 34 - Winter Weather Events*:

Table 34 - Winter Weather Events

Winter Weather Events	
Weather Event	**Classification**
Heavy Snowstorm	Accumulations of four inches or more in a six-hour period, or six inches or more in a twelve-hour period.
Sleet Storm	Significant accumulations of solid pellets which form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces posing hazards to pedestrians and motorists.
Ice Storm	Significant accumulations of rain or drizzle freezing on objects (trees, power lines, roadways, etc.) as it strikes them, causing slippery surfaces and damage from the sheer weight of ice accumulation.
Blizzard	Wind velocity of 35 miles per hour or more, temperatures below freezing, considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period of time.
Severe Blizzard	Wind velocity of 45 miles per hour, temperatures of 10 degrees Fahrenheit or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period time.

Lawrence County and its 27 municipalities are susceptible to the entire range of severe weather, from heavy snow storm to severe blizzard. The worst case scenario would be a series of multiple, severe blizzards causing major disruptions to utilities and transportation and limiting the effectiveness of emergency response activities.

4.3.13.3 Past Occurrence

Winter storms occur on the average of five times a year in Lawrence County.

In the winter of 1993-94, the state was hit by a series of protracted winter storms. The severity and nature of these storms combined with accompanying record-breaking frigid temperatures posed a major threat to the lives, safety and well-being of Commonwealth residents and caused major disruptions to the activities of schools, businesses, hospitals and nursing homes.

The first of these devastating winter storms occurred in early January with record snowfall depths (in excess of 33 inches in the southwest and south-central portions of the Commonwealth), strong winds and sleet/freezing rains. Numerous storm-related power outages were reported and as many as 600,000 residents were without electricity, in some cases for several days at a time.

Serious power supply shortages continued through mid-January because of record cold temperatures at many places, causing sporadic power generation outages across the Commonwealth. The entire Pennsylvania-New Jersey-Maryland grid and its partners in the District of Columbia, New York and Virginia experienced 15-30 minute rolling blackouts, threatening the lives of people and the safety of the facilities in which they resided. Power and fuel shortages affecting Pennsylvania and the East Coast power grid system required the Governor to recommend power conservation measures be taken by all commercial, residential and industrial power consumers.

The record cold conditions resulted in numerous water-main breaks and interruptions of service to thousands of municipal and city water customers throughout the Commonwealth. Additionally, the extreme cold in conjunction with accumulations of frozen precipitation resulted in acute shortages of road salt. As a result, trucks were dispatched to haul salt from New York to expedite deliveries to PA Department of Transportation (DOT) storage sites.

During January and February 1994, Pennsylvania experienced at least 17 regional or statewide winter storms. The consequences of these disasters resulted in the need for intervention by the President in an effort to alleviate the severity of the hardship and to aid the recovery of the hardest-hit counties.

In January 1996, another series of severe winter storms with 27 and 24 inch accumulated snow depths was followed by 50 to 60 degree temperatures resulting in rapid melting and flooding.

Lawrence County is vulnerable to an array of winter weather. This weather has the ability to close businesses, close schools and block and damage roadways throughout the county. The average snowfall is 60-80 inches per year depending upon location within the county. The history of major winter storms in Lawrence County since 1966 is outlined in *Table 35 - Severe Winter Weather Occurrences*.

Table 35 - Severe Winter Weather Occurrences

Severe Winter Weather Occurrences in Lawrence County	
Past Occurrence	**Hazard**
January 1966	Heavy snow
February 1972	Heavy snow
January 1977	Severe Winter Weather
January 1978	Heavy snow
February 1978	Blizzard
March 1993	Blizzard
January 1994	Severe Winter Storms
January 1996	Severe Winter Storms
November 1997	Ice Storm
January 1999	Severe Winter Storm
December 2000	Severe Winter Storm
December 2002	Ice Storm/Heavy Snow
February 2003	Heavy Snow
December 2003	Heavy Snow
February 2004	Ice Storm
January 2005	Heavy Snow
March 2005	Heavy Snow
December 2005	Ice Storm
February 2007	Heavy Snow/ Ice Storm
December 2007	Severe Winter Storm
February 2008	Severe Winter Storm
December 2009	Severe Winter Storm/ Ice Storm
January 9, 2009	Severe Winter Storm/ Ice Storm
February 12, 2009	High Winds
December 9, 2009	High Winds
December 9, 2009	Building collapse (vacant)
February 6 2010	Winter Storm
February 8, 2010	Emergency Declaration Adverse/Severe Weather- Wayne Township
February 18, 2010	Roof Collapses (in 2 municipalities)
February 19, 2010	Emergency Declaration Adverse/Severe Weather-Enon Valley Boro
January 31, 2011	Winter Weather Warning
February 22, 2011	Winter Weather Events
February 28, 2011	Flooding Events with search and rescue operations
January 31, 2013	Wind damage
February 4, 2014	Winter Storm

4.3.13.4 Future Occurrence

There is a likely probability of winter weather and winter storms occurring in Lawrence County, with expected annual events. The county is located in an area with the chance of equaling or exceeding total snow depths of 31 to 50 inches. An analysis of the past occurrences indicates that this trend will continue annually in the future. A risk factor of 3.1 is associated with this natural hazard. Approximately thirty-six winter storms occur across Pennsylvania every year, with Lawrence County experiencing approximately five annually.

4.3.13.5 Vulnerability Assessment

Since winter storms are a regular occurrence in Lawrence County, as well as other counties throughout the Commonwealth, strategies have been developed to respond these events. Snow removal and utility repair equipment is present to respond to typical events. The use of auxiliary heat and electricity supplies such as wood burning stoves, kerosene heaters and gasoline power generators reduces the vulnerability of specific structures. Locations lacking adequate equipment to protect against cold temperatures or significant snow and ice are more vulnerable to winter storm events. Even for communities that are prepared to respond to winter storms, severe events involving snow accumulations that exceed six or more inches in a twelve hour period can cause a large number of traffic accidents, interrupt power supply and communications and cause the failure of inadequately designed and/or maintained roof systems.

Similar to the vulnerability assessment discussion for tornados and severe wind, vulnerability to the effects of winter storms on buildings is dependent on the age of the building type, construction material used and condition of the structure. Additional information on construction type and building codes enforced at time of construction would allow a more thorough assessment of the vulnerability of structures to winter storm impacts such as severe wind and heavy snow loading. Based on the information available, all 27 communities within Lawrence County are equally vulnerable to the direct impacts of winter storms.

4.3.14. Civil Disturbance

4.3.14.1 Location and Extent

Throughout the history of 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 impact is generally low.

4.3.14.2 Range of Magnitude

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 performed. 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 as a result of the disturbance. 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.

4.3.14.3 Past Occurrence

There have been no major civil disorders in Lawrence County.

4.3.14.4 Future Occurrence

The probability is likely for a civil disorder in Lawrence County to occur. A risk factor of 2.2 has been assigned to this hazard utilizing the risk factor assessment tool. Large scale incidents are less likely to occur than low or moderate scale incidents.

4.3.14.5 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 seriousness of the event may well be exacerbated by how authorities handle the crowd.

4.3.15. Dam Failure

4.3.15.1 Location and Extent

There are no high hazard dams located within Lawrence County, but there are five dams outside of Lawrence County that could significantly impact population and structures within the County in the event of dam failure. The county does not have digital copies of dam inundation maps. Paper maps are found at the County Courthouse. Flood Insurance Rate Maps were analyzed to determine the water bodies that were dammed and the direction of the downstream flow of flooding that would come from dam failures. Three of the dams impact the Mahoning River or tributaries into the Mahoning River. One dam impacts the Shenango River dam. One dam impacts Muddy Creek that quickly converges into Slippery Rock Run. Since the exact inundation areas were not known at the time of the update, all communities that have the dammed water bodies running through them are listed. The actual impact of flooding from dam failures could be greater or less than the communities listed below.

- Shenango River Dam (Mercer County) - The Shenango River Dam dams the Shenango River in Mercer County. Pulaski, Neshannock, Mahoning, Union, New Castle and Taylor Townships in Lawrence County are downstream of the dam on the Shenango River and could be impacted with flooding caused by dam failure.
- Moraine State Park Dam (Butler County) - The Moraine State Park Dam dams the Muddy Creek in Butler County. Muddy Creek flows downstream into Slippery Rock Run in Slippery Rock Township, Lawrence County. Slippery Rock Township could be impacted by flooding caused by dam failure on Muddy Creek. If the flooding from a dam failure continued along Slippery Rock Run, Perry and Wayne Townships could also be impacted.
- Mosquito Creek Dam (Ohio) - The Mosquito Creek Dam dams the Mosquito Creek in Trumbull County, Ohio. Mosquito Creek flows downstream into the Mahoning River in Trumbull County, Ohio. Mahoning, Union, New Castle, North Beaver and Taylor Townships in Lawrence County are downstream of the dam on the Mahoning River and could be impacted with flooding caused by dam failure.
- Berlin Lake Dam (Ohio) - The Berlin Lake Dam dams the Mahoning River in Mahoning County, Ohio. Mahoning, Union, New Castle, North Beaver and Taylor

Townships in Lawrence County are downstream of the dam on the Mahoning River and could be impacted with flooding caused by dam failure.

- M.J. Kirwan Dam & Reservoir (Ohio) - The M.J. Kirwan Dam dams the West Branch of the Mahoning River in Portage County, Ohio. The West Branch of the Mahoning River flows downstream into the Mahoning River in Trumbull County, Ohio. Mahoning, Union, New Castle, North Beaver and Taylor Townships in Lawrence County are downstream of the dam on the Mahoning River and could be impacted with flooding caused by dam failure.

The Nashua Bridge area of Pulaski Township would be heavily impacted by a failure of the Shenango River Dam. A dam failure at Lake Arthur could directly affect certain areas of Slippery Rock Township.

4.3.15.2 Range of Magnitude

Dam safety laws are embodied in the Dam Safety and Encroachments Act ("DSE Act")-enacted July 1, 1979 and last amended in 1985. Rules pertaining to dam safety are found in Title 25-Rules and Regulations; Part I-Department of Environmental Resources; Subpart C-Protection of Natural Resources; Article II-Water Resources; Chapter 105-Dam Safety and Waterway Management ("the Rules") adopted September 16, 1980. (www.damsafety.org)

Dams assigned the significant-hazard potential classification are those dams where failure or incorrect operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or 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 incorrect operation has a great possibility of causing loss of human life.

4.3.15.3 Past Occurrence

There have been no major dam failures in Lawrence County. Other small dam failures have occurred over the years with very limited impacts.

4.3.15.4 Future Occurrence

Minor dam failures occur quite frequently. However, they often go unnoticed and cause little or no damage or effects on the general population. A risk factor of 1.9 has been assigned to this hazard utilizing the risk factor assessment tool. Significant dam failures occur much less frequently. The probability of a significant dam failure in Lawrence County is unlikely to occur. Dam failures are often a secondary effect, resulting from another hazard, such as heavy rainfall from a hurricane or tropical storm.

4.3.15.5 Vulnerability Assessment

There is always the possibility any dam could fail, however the probability is unlikely in Lawrence County. According to 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.

No significant high hazard or low hazard dams have been identified in Lawrence County. The local planning team anticipates that some agricultural dams may be present throughout Lawrence County. The local planning team will develop a hazard mitigation strategy to inventory and document all dams throughout the county and possibly in other counties that would impact Lawrence County during a failure.

4.3.16. Disorientation

4.3.16.1 Location and Extent

Disorientation is the loss of one's sense of direction, position, or relationship with one's surroundings. This can also be defined as mental confusion or impaired awareness. In Lawrence County, disorientation can vary from a missing child to a person lost on the waterways. Emergency services will be expected to search for missing or disoriented persons at all times of the year and in all types of conditions. Disorientation events have the potential to take place throughout the county.

4.3.16.2 Range of Magnitude

All ranges of the population, from age to social status, would be at a maximum threat to disorientation. The county has state game-lands, a state park and trails; to include State Game Land 148 in New Beaver, SGL 150 Pulaski Twp., SGL 151 Washington Twp., SGL 178 Neshannock Twp. and SGL 216, Scott Twp.; McConnell's Mill State Park in Slippery Rock Twp.; North Country Trail and Stavich Bike Trail.

4.3.16.3 Past Occurrence

Table 36 - Disorientation Incidents below depicts the events that required emergency service personnel to be utilized for search and rescue of disoriented persons from January 2009 to December 2013. Those persons that were disoriented but did not require emergency service personnel to assist them are not accounted for as it is difficult to determine the frequency of occurrence.

Table 36 - Disorientation Incidents

Disorientation Incidents in Lawrence County Requiring First Responders			
Date(s)	**Location / Municipality**	**Duration of search**	**Details**
05/02/09	Slippery Rock Twp.	2 hours	Hikers
05/22/09	North Beaver Twp.	1 hr. 40 minutes	Search detail
08/15/10	Bessemer Borough	13 hrs. 43 minutes	Missing person
12/29/10	Wayne Twp.	4 hrs. 19 minutes	Search detail
08/09/11	Slippery Rock Twp.	3 hours	Lost Hikers
02/25/12	New Castle City	1 hr. 54 minutes	Body found in river
03/04/12	Neshannock Twp.	46 minutes	Search detail

Disorientation Incidents in Lawrence County Requiring First Responders			
Date(s)	**Location / Municipality**	**Duration of search**	**Details**
04/22-25/12	New Castle City	3 days	Missing person/ body found
11/05/12	Neshannock Twp.	20 minutes	Missing person
11/29-30/12	Perry Twp.	3 hr. 58 minutes	Search detail
02/10/13	Neshanock Twp.	2 hr. 2 minutes	Search detail
05/11/13	Slippery Rock Twp.	39 minutes	Search detail
07/25/13	Lawrence County	12 hr. 15 minutes	Search detail
09/5-9/13	Neshannock Twp.	4 days	Lost person
10/30/13	Lawrence County	1 hr. 26 minutes	Search detail
Source: Lawrence County Knowledge Center™ Event Log			

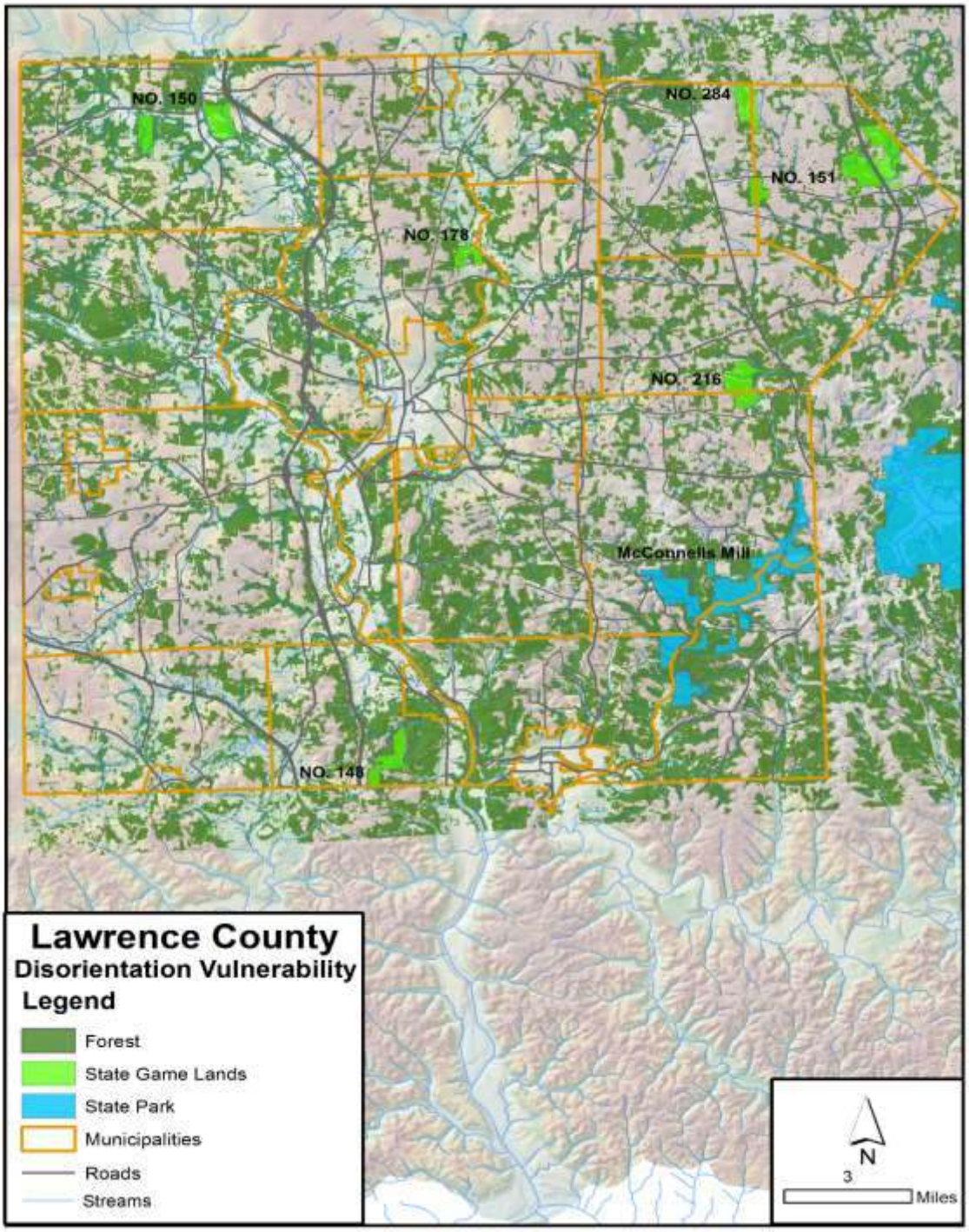
4.3.16.4 Future Occurrence

The probability of a disorientation event is highly likely. Citizens should be aware of their surroundings, although the very young and those with mental incapacities will always be at a higher risk. Hunters should be aware of the areas that they hunt. Maps and other resources would enhance the hunter's capabilities to navigate safely. A risk factor of 2.6 has been assigned to this hazard.

4.3.16.5 Vulnerability Assessment

Disorientation events are typically a local event, but sometimes may span across municipality and county borders as state game lands and forests lie within numerous municipalities. A search and rescue operation can take place in all types of settings, to include a village, a park, forested lands, or lakes and ponds.

Figure 27 - Disorientation Vulnerability Map



4.3.17. Drowning

4.3.17.1 Location and Extent

Drowning events in Lawrence County can occur in the numerous streams and lakes within the county. It is the intention of this report to document this hazard in natural bodies of water and not in swimming pools or other commercial/residential settings.

4.3.17.2 Range of Magnitude

According to the U.S. Census Bureau, the county has a total area of 363 square miles (940.2 km2), of which 358.2 square miles (927.7 km2) is land and 4.5 square miles (11.7 km2) (1.2%) is water. Major waterways are the Shenango River, Neshannock Creek and the Mahoning River which form the Beaver River. Also, the Slippery Rock Creek and Connoquenessing Creek empty into the Beaver River. *Table 37 - Waterways, Streams and Lakes* lists the waterways, streams and lakes in Lawrence County.

Table 37 - Waterways, Streams and Lakes

Waterways, Streams and Lakes Within Lawrence County			
Name	**Type**	**Name**	**Type**
Beaver Dam Run	Creek	Jordans Run	Dam
Big Run	Creek	Lakewood Dam	Dam
Brush Run	Creek	Little Neshannock	Creek
Big Beaver Pond	Pond	Madden Run	Creek
Cascade Lake	Lake	Mahoning River	River
Cheeseman Run	Creek	Marshall Run	Creek
Clarks Run	Creek	Mckee Run	Creek
Coffee Run	Creek	Muddy Creek	Creek
Connoquenessing Creek	Creek	Neshannock Creek	Creek
Deer Creek	Creek	Quakertown Falls	Creek
Duck Run	Creek	Shenango River	Creek
Eckles Run	Creek	Skunk Run	Creek
Edwards Run	Creek	Slippery Rock Creek	Creek
Harman Run	Creek	Small Run	Creek
Hell Run	Creek	Snake Run	Creek
Hickory Creek	Creek	Spill Way Falls	Creek
Hickory Run	Creek	Squaw Run	Creek
Homewood Falls	Creek	Stockman Run	Creek
Honey Creek	Creek	Sugar Creek	Creek
Hottenbaugh Run	Creek	Thompson Run	Creek
Jenkins Run	Creek	Wampum Run	Creek

A secondary hazard from a drowning is the potential for a rescuer to lose their life while trying to rescue a drowning person, or recover a drowned person's body. There is also a hazard from flash flooding victims to drown. The National Weather Service has adopted the "Turn Around, Don't Drown" slogan to inform the public of the hazards of traveling through or near flood waters. People often underestimate the force and power of water.

Many of the deaths occur in automobiles as they are swept downstream. The next highest percentage of flood-related deaths is due to walking into or near flood waters. A mere six inches of fast-moving water can knock over an adult and it only takes two feet of rushing water to carry away most vehicles; to include pickups and SUVs.

4.3.17.3 Past Occurrence

Table 38 - Water Rescue Events list the past occurrence of water rescues performed within Lawrence County between 2009 and 2013 per the Lawrence County Knowledge Center™ log.

Table 38 - Water Rescue Events

Water Rescue Events in Lawrence County		
Event Date(s)	**Event Type/Details**	**Location**
06/29/09	Search & Rescue - Water rescue	Taylor Twp.
02/28/11	Search & Rescue – Evacuation via boat	Wilmington Twp.
02/28/11	Search & Rescue – Evacuation via boat	Hickory Twp.
02/28/11	Search & Rescue – Water Rescues	New Beaver Borough
04/30/11	Search & Rescue – River Search	Slippery Rock Twp.
02/25/12	Search & Rescue – Body found in the river	New Castle City
06/01/12	Search & Rescue – Water rescue	Ellwood City Borough
08/02/12	Search & Rescue – Water rescue/search	Taylor Twp.
05/20/13	Search & Rescue – Water rescue	Slippery Rock Twp.
05/29/13	Search & Rescue – Water rescue	Slippery Rock Twp.
07/10/13	Search & Rescue – Water rescue at Kerrs' Trailer Park	Shenango Twp.
07/10/13	Search & Rescue – Water rescue	New Castle City

4.3.17.4 Future Occurrence

The potential exists for future occurrence of drowning due to the large number of bodies of water within Lawrence County. Visitors entering McConnell's Mill State Park for example should be aware of the natural hazards and steep terrain of the Slippery Rock Creek Gorge. This area contains smooth rocks that are often damp and slippery and varying degrees of whitewater conditions, including deep pools, rapids and swift currents. Slippery Rock Creek is a Class II to IV River, depending on water level. Numerous accidents here have resulted in injury and death. Research will continue on this hazard.

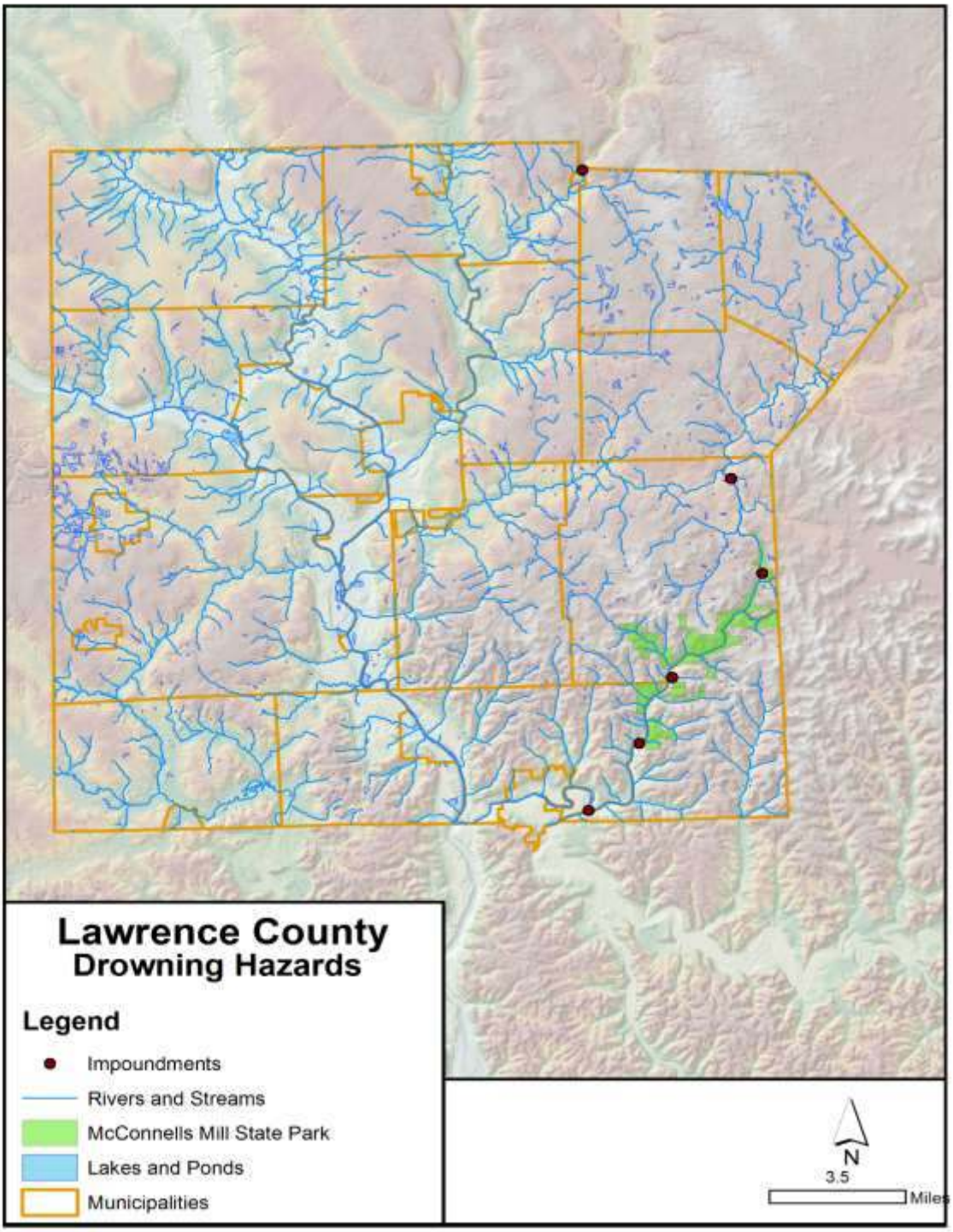
Table 39 - River Difficulty Scale

International Scale of River Difficulty	
Class I	Fast moving water with riffles and small waves. Few obstructions, all obvious and easily missed with little training. Self-rescue is easy.
Class II	Novice - Straightforward rapids with wide, clear channels which are evident without scouting. Occasional maneuvering may be required, but rocks and medium-sized waves are easily missed by trained paddlers.
Class III	Intermediate - Rapids with moderate, irregular waves which may be difficult to avoid and which can swamp an open canoe. Complex maneuvers in fast current and good boat control in tight passages or around ledges is often required. Strong eddies and powerful current effects can occur
Class IV	Advanced - Intense, powerful but predictable rapids requiring precise boat handling in turbulent water. May be large, unavoidable waves and holes or constricted passages demanding fast maneuvers under pressure. Rapids require "must" moves above dangerous hazards. Self-rescue is difficult.

4.3.17.5 Vulnerability Assessment

With the lakes and streams that are listed above in *Table 37 - Waterways, Streams and Lakes* and the numerous unnamed ponds the potential for a drowning to occur is great. Those that are vulnerable to a drowning include all ages of the population and the emergency services personnel that assist in these disasters.

Figure 28 - Drowning Vulnerability Map



4.3.18. Environmental Hazards

4.3.18.1 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 these materials while being transported. Hazardous materials include flammable liquids, solids, gasses, combustible liquids, explosives, blasting agents, radioactive materials, oxidizing materials, corrosive materials, poisons, refrigerated liquids, hazardous waste/substances and other regulated material. With the multiple forms of transportation in Lawrence County, hazardous materials such as chemicals, fuels and other hazardous materials are frequently transported through the county. The carriers of hazardous materials, however, must have response plans in place in the event of an accident.

Pennsylvania was the first place in the world where a commercial successful well was drilled for oil production. Natural gas wells followed. Pennsylvania is a significant producer of natural gas in the northeast United States. Since the first commercial oil well was drilled in Pennsylvania in 1859, perhaps as many as 350,000 oil and gas wells have been drilled in the state.

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). The community right-to-know reporting requirements keep communities abreast of the presence and release of chemicals at individual facilities. EPCRA was designed to ensure that state and local communities are prepared to respond to potential chemical accidents through Local Emergency Planning Committees (LEPCs). LEPCs are charged with developing emergency response plans for SARA Title III facilities; these plans cover the location and extent of hazardous materials, establish evacuation plans, response procedures, methods to reduce the magnitude of a materials release and establish methods and schedules for training and exercises. Information about the chemicals that are being manufactured or processed in facilities can be found in the U.S. Environmental Protection Agency's (USEPA) Toxic Release Inventory (TRI) database: (http://www.epa.gov/enviro/geo_data.html).

Transportation of hazardous materials on highways involves tanker trucks or trailers. Unsurprisingly, large trucks are responsible for the greatest number of hazardous material release incidents.

Table 40 - SARA Facilities lists the SARA Title III facilities located in Lawrence County, as well as whether or not the facility resides in the floodplain. Lawrence County has a total of 27 SARA facilities.

Table 40 - SARA Facilities

Lawrence County SARA Facilities		
Name	**Location**	**100 year Floodplain**
Advanced Waste Services of PA, LLC	101 River Park Drive, New Castle, PA 16101	x
AT&T	Fowler Lane, New Castle, PA 16101	
Axion Power Battery Manufacturing	3601 Clover Lane, New Castle, PA 16105	
Dairy Farmers of America, Inc.	925 State Route 18, New Wilmington, PA 16142	
Deerfield Farms	193 Black Road, Volant, PA 16156	
Ellport WWTP	1 Third Street, Ellwood City, PA 16117	
Ellwood Quality Steels Company	700 Moravia Street, New Castle, PA 16101	x
Ferguson Perforating Company	901 Commerce Avenue, New Castle, PA 16101	
Flowline Division, Ezeflow USA, Inc.	1400 New Butler Road, P O Box 7027, New Castle, PA 16107	
Inmetco	One Inmetco Drive, Ellwood City, PA 16117	
Kennametal, Inc.	599 Northgate Circle, New Castle, PA 16105	
New Castle Sanitation Authority	512 Montgomery Avenue, New Castle, PA 16101	x
New Castle Service Center	215 East North Street, New Castle, PA 16101	
New Wilmington Borough WWTP	155 Maple Street Ext., New Wilmington, PA 16142	
NRG Power Midwest LP	2189 State Route 168, West Pittsburg, PA 16160	
Pennsylvania American Water Company	907 Lundys Lane, Ellwood City, PA 16117	x
Pennsylvania American Water Company	546 Leasure Avenue Ext., New Castle, PA 16105	x
Sears Auto Center	2500 West State Street, New Castle, PA 16101	
Tanner Industries	501 Industrial Street, New Castle, PA 16101	x
Verizon - Ellwood City	209 5th Street, Ellwood City, PA 16117	
Verizon - New Bedford	Main Street, New Bedford, PA 16140	
Verizon - New Castle	40 South Mercer Street, New Castle, PA 16101	x
Verizon - New Wilmington	127 West Vine Street, New Wilmington, PA 16142	
Verizon - Princeton	2280 Mill Bridge Road, New Castle, PA 16101	
Wampum Borough WWTP	101 Water Street, Wampum, PA 16157	
Wilmington Township Sewer Treatment Plant	204 Orchard Terrace Drive, New Castle, PA 16105	x
Young Galvanizing	8281 Mercer Street, Pulaski, PA 16143	

Source: Lawrence County Emergency Management Agency

4.3.18.2 Range of Magnitude

Hazardous material releases can contaminate air, water and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas. With a hazardous material release, whether accidental or intentional, there are several potentially exacerbating or mitigating circumstances that will affect its severity or impact. Exacerbating conditions are characteristics that can enhance or magnify the effects of

a hazard. Mitigating conditions, on the other hand, are characteristics of the target and its physical environment that can reduce the effects of a hazard. These conditions include:

- Weather conditions – affects how the hazard develops;
- Micro-meteorological effects of buildings and terrain – alters dispersion of materials;
- Shielding in the form of sheltering-in-place – protects people and property from harmful effects;
- Non-compliance with applicable codes (e.g. fire and building codes) and maintenance failures (e.g. fire protection and containment features) – can substantially increase the damage to the facility itself and to surrounding buildings.

4.3.18.3 Past Occurrence

According to the Bureau of Transportation Statistics, in 2000, of the 1,115 spills in Pennsylvania, 1,065 happened on highways. These spills cost the Commonwealth approximately $2.5 million. With Lawrence County having Marcellus shale formation, there has been an increase in this type of well drilling. This type of well drilling brings with it different hazards not seen with shallow well drilling. There have been incidents involving wells in the past including well heads being struck, gas migrating into water wells and gas migrating into structures. One such incidence of gas migrating happened in Pulaski Township on June 1, 2012.

Table 41 - Past Environmental Hazard Occurrences lists past environmental hazards occurrences in Lawrence County, as reported on Knowledge Center™.

Table 41 - Past Environmental Hazard Occurrences

Past Environmental Hazard Occurrences			
Date	**Incident**	**Location**	**Details**
10/18/08	Waste oil spill	Mahoning Township	2,500 gallons of waste oil spilled on North Edinburg Road and Benjamin Franklin Highway
10/25/08	Diesel fuel spill	Plain Grove Township	Motor vehicle accident with saddle tanks of a truck leaking on I-79 at the 106 ½ mile marker.
12/29/08	Minor fuel spill	Union Township	25 gallons of gasoline spilled at the Get Go gas station.
02/08/09	Kerosene leak	Union Township	An above ground 275 gallon tank leaking. 10-15 gallons leaked out.
05/18/09	Nitric acid spill	Wilmington Township	Unknown quantity of Nitric acid leaked into storm drains at a SARA Facility.
06/12/09	MVA with gas leak	Neshannock Township	A car coasted out of a parking lot, striking a structure. Part of the structure collapsed damaging a natural gas line causing a release of gas.
06/17/09	Home heating oil spill due to flooding	Bessemer Borough	Two 275-gallon heating oil tanks leaked into a building following flooding in the basement.

Past Environmental Hazard Occurrences			
Date	**Incident**	**Location**	**Details**
06/30/09	Gas well leaking	Washington Township	A farmer disking his field struck a gas well resulting in a large amount of gas leaking.
07/09/09	MVA involving a car on a gas pump	Shenango Township	A passenger vehicle exited the road and wrecked into a gasoline pump. Less than 5-gallons of gas was spilled.
07/11/09	Natural gas leak	Ellwood City Borough	Natural gas leaking from a stove inside a residence.
07/20/09	Natural gas well leak	Plain Grove Township	A natural gas well owned/operated by Exco North Coast Energy is releasing natural gas. Reports state it sounds as though there is a malfunctioning relief valve.
07/30/09	Fuel leak from underground tank	Slippery Rock Township	An unknown amount of fuel seeped into the ground from an old underground tank at the old Wrights Furniture Barn.
08/14/09	Hazardous material fire	New Castle City	Transformer oil at a local scrap yard on fire.
08/14/09	Hazardous material fire	Hickory Township	3-oil drums on fire behind Cooks Junkyard.
12/05/09	Oil leak from holding tank	New Castle City	To 275 gallon oil tanks were shot overnight. One tank was emptied and the other was 2/3 full and was plugged. Oil leaked into the ground.
12/07/09	Natural gas odor	Ellwood City Borough	EMS dispatched for a patient with difficulty breathing. After being on scene for 5 minutes EMS requested Fire Department for an odor of natural gas in the complex.
01/24/10	Ammonia leak	Wayne Township	A small amount of ammonia at the water plant leaked into the air.
04/08/10	Gas leak	New Castle City	A strong smell of gas in the New Castle City building. Fire department on scene with a high explosive rate of gas reported. The building was evacuated.
05/29/10	Hazardous materials	Mahoning Township	2 bottles of arsenic and another jar of an unknown material found in an old barn.
07/26/10	Gas leak	New Castle City	Medium sized gas line leak.
07/30/10	Gas leak	Union Township	Fire department on scene of a large gas leak on Miller Road, Union Twp.
11/16/10	Gas leak	Ellwood City Borough	Gas leak inside Ellwood Forge, building evacuated.
02/03/11	Natural gas leak with evacuation	Ellwood City Borough	Smell of natural gas in the Loop Street Housing Complex. The building houses 4 apartments was evacuated.
04/09/11	Diesel fuel leak	Taylor Township	CSX Rail yard reported diesel fuel leaking from a train engine fuel tank. Approximately 20-30 gallons of diesel fuel was on the ground.
07/18/11	Heating oil spill	Plain Grove Township	Approximately 275 gallons of home heating kerosene leaked from a tank.
08/08/11	Natural gas leak	New Castle City	Smell of natural gas in a Skilled Nursing Home kitchen. Building was ventilated and there was no need to evacuate.

Past Environmental Hazard Occurrences			
Date	**Incident**	**Location**	**Details**
08/17/11	Diesel Fuel Spill	Plain Grove Township	50 gallons of diesel fuel spilled at the southbound rest stop I-79 from an unknown vehicle.
09/11/11	MVA with damage to a gas meter	Shenango Township	A car went off the road and sheared off a gas meter, releasing natural gas.
10/13/11	Gas leak	New Castle City	Travers J F Construction Company reported that an unmarked gas line was struck and had a release of gas, migrated into a residence. A total of 15 people were evacuated from their homes. The gas line is owned/operated by Columbia Gas.
02/28/12	Natural gas smell	New Castle City	Report of a strong odor of natural gas in the downtown area of New Castle. Columbia Gas and New Castle Fire Department on scene.
06/01/12	Gas migration	Pulaski Township	DEP Oil & Gas staff received notification from Hilcorp Energy that gas was detected in the water well head space at the McAllen residence. There was no gas detected in the dwelling. The water well was vented, and Hilcorp supplied the residence with water.
10/11/12	Gas line struck	New Castle City	A gas line was struck in front of a residence on Eastbrook Street. No evacuations occurred.
04/30/13	Natural gas leak	New Castle City	Natural gas leak outside of New Castle's George Washington School. Fire department evacuated the children from the school.
04/30/13	Fuel leak from tractor trailer	Neshannock Township	Fire, police and EMA responded to Paul's Beverage at the Northgate Industrial Park for a tractor trailer leaking fuel. Approximately 40 gallons leaked from the fuel tanks and was contained.
05/16/13	Hazardous material spill	Neshannock Township	Electrical transformer down and approximately 75-100 gallons of fluid leaked into the storm drain.
06/17/13	Heating oil spill	Shenango Township	Approximately 50-gallons of home heating oil leaked from the residence and was found in the ditch and stream.
06/23/13	Ethanol leak	Taylor Township	CSX Railroad reported that a tanker car is actively leaking Ethanol. Unknown amount leaked.
08/06/13	Lube oil spill	Enon Valley Borough	Norfolk Southern reported approximately 2 gallons of lube oil spilled from a locomotive onto the railroad ballast at milepost PC 43.7.
08/15/13	Gas leak in apartment complex	Unknown jurisdiction within Lawrence County	A gas leak was reported at an apartment complex that was involved in a structure fire the night before.
08/22/13	Hazmat spill	Lawrence County	An unknown amount of sulfuric acid entered the Shenango River in Mercer County at JMC in Wheatland.

The majority of the environmental hazards within Lawrence County are oil and/or oil based products. There was one instance where a SARA facility had a spill of Nitric acid in 2009.

4.3.18.4 Future Occurrence

The overall probability of Lawrence County experiencing an environmental hazard is possible. A risk factor of 3.3 has been assigned to this hazard utilizing the risk factor methodology probability criteria. The increase in drilling activities increases the potential for incidents. The occurrence of this event is high, however; the potential for a large scale event is present.

Transportation hazardous material spills occur annually. While minor spills are more common than larger spills, both can occur with varying levels of severity. It is extremely difficult to predict a transportation hazardous material incident. Weather conditions, roadway conditions and other human factors impact the occurrence of these incidents.

Fixed facility hazardous material releases do occur but not as frequently as transportation incidents. The Local Emergency Planning Commission (LEPC) for Lawrence County maintains and updates emergency plans for SARA Title III facilities throughout the county. The county LEPC also identifies the facilities that must report the Tier II chemicals for their facility through the Hazardous Materials Emergency Planning and Response Act (1990-165) as amended.

4.3.18.5 Vulnerability Assessment

Hazardous material releases can occur at facilities (fixed sites) or along transportation routes. Hazardous material releases can create direct injuries and death and contaminate air, water, and soils. They can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary hazards. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances, and hazardous wastes. An accidental hazardous material release can occur wherever hazardous materials are manufactured, used, stored, or transported. Such releases can affect the nearby population and contaminate critical or sensitive environmental areas.

There are increasingly large numbers of chemicals, oils, radioactive materials and other hazardous substances spilled as the result of highway, rail and waterway accidents, storage tank leakage, pipeline break, and/or other accidents. On occasion, these events become a major disaster and force people to evacuate and/or lose their homes and businesses.

There are currently 27 fixed SARA sites in Lawrence County which use, manufacture, store, or treat hazardous materials (Source: Local Emergency Planning Committee).

The following municipalities are threatened by hazard material incidents unique to their area.

Bessemer Borough

Hazardous materials are transported through Bessemer Borough on State Route 317.

Bessemer Borough has a Sara Title III facility within its municipal borders.

City of New Castle

Parts of major transportation arteries pass through the City of New Castle making it susceptible to Hazardous Materials Transportation Incidents.

Several SARA facilities are located within the City of New Castle.

Ellport Borough

The proximity of Ellport Borough to the Nalco Chemical Facility and the Ellport Borough Wastewater Treatment Plant makes it vulnerable to an event at either of these facilities.

A portion of State Route 488 travels through Ellport Borough. Commercial vehicles transporting hazardous materials travel through heavily populated areas of Ellport Borough while using this route.

Ellwood City Borough

The proximity of a section of the Pennsylvania Turnpike could affect some parts of the municipality in the event of a hazardous materials transportation incident in that area.

Enon Valley Borough

The Norfolk and Southern railway travels through Enon Valley Borough and transports high quantities of hazardous materials that, in the event of an incident, would affect populations around the incident.

A feed mill is a large part of the business infrastructure of Enon Valley Borough. A fire at that facility would affect the entire municipality.

Little Beaver Township

The Norfolk and Southern Rail Road and the Pennsylvania Turnpike pass through the southern part of the Municipality, making it susceptible to a transportation hazardous materials Incident.

Mahoning Township

US Routes 224 and 422 and State Route 551 pass through Mahoning Township and are heavily traveled by commercial vehicles transporting hazardous materials. Also, the main line of the CSX railroad passes through Mahoning Township. Any type of transportation incident would have a direct effect on the municipality.

Zambelli Fireworks and Wampum Hardware are located within the municipal boundaries of Mahoning Township. Both facilities store large quantities of explosives.

Neshannock Township

I-376 and PA Route 18 pass through Neshannock Township and are heavily traveled by vehicles transporting hazardous materials.

Several SARA Facilities are located within Neshannock Township and have the potential to affect the municipality.

New Beaver Borough

The proximity of New Beaver Borough to both highways and railroads that transport hazardous materials make it susceptible to the impact of a transportation hazardous materials incident.

Aleron, a facility that processes nuclear waste is located within close proximity to the population of New Beaver Borough. An incident at that facility would impact all parts of the population.

North Beaver Township

A part of the Norfolk and Southern Rail Road passes through the southern part of the Township, making it susceptible to the impact of a transportation hazardous material incident.

I-76 and I-376 traverse the township making it susceptible to the impact of a transportation hazardous material incident.

The Neomet facility located on State Route 551 in North Beaver Township stores hazardous materials. An incident at that facility would affect populations within that area.

Perry Township

Route 488 in Perry Township is traveled by commercial vehicles transporting hazardous materials into and out of the Ellwood City area.

Plain Grove Township

Interstate 79 passes through Plain Grove Township and is heavily traveled by vehicles transporting hazardous materials.

Pulaski Township

Parts of US Route 422 and Interstate 376 pass through Pulaski Township and are heavily traveled by commercial vehicles transporting hazardous materials.

Young Galvanizing, a SARA Facility, is located in close proximity to the village of Pulaski. An incident at the facility would heavily impact the residents of that area.

Scott Township

US Route 19 passes through Scott Township and is heavily traveled by both commercial and non-commercial vehicles.

Shenango Township

All portions of U.S. Route 422 and PA Route 65 which pass through Shenango Township are heavily traveled by commercial vehicles transporting hazardous materials.

SARA Facilities located within Shenango Township have a potential for hazardous materials incidents.

SNPJ Borough

The Pennsylvania Turnpike and a part of the Norfolk and Southern Railroad pass close, but not through SNPJ Borough. A transportation incident could affect the entire area. Each rail company has a hazardous materials response team which is fully equipped to respond when needed.

Some amounts of Chlorine are stored in the area of the Municipal swimming pool. A chlorine leak could affect the Municipality.

Taylor Township

The CSX Railroad has a yard and terminal located within Taylor Township. State Route 168 also passes through Taylor Township and is heavily traveled by commercial vehicles.

An incident at one of the SARA Facilities located within Taylor Township would affect all areas and populations of the Municipality.

Slippery Rock Township

Portions of three major transportation arteries pass through Slippery Rock Township. All of these highways are heavily traveled by hazardous materials carriers.

Slippery Rock Township has no municipal water supply. All areas are served by wells. A hazardous materials spill would have direct impact on these wells.

Union Township

All portions of Interstate 376, US 422, and US 224 are heavily traveled by commercial vehicles, many of which are transporting hazardous materials.

Volant Borough

State Routes 168, and 208 pass through Volant Borough. These highways are traveled by commercial vehicles, many of which are transporting hazardous materials.

Wampum Borough

The CSX and Norfolk and Southern Railway systems pass through Wampum Borough. Both transport large quantities of hazardous materials. An incident on either of these railroads would affect all residents and areas of Wampum Borough. Also, Route 18 passes through the Municipality and is also heavily traveled by transporters of hazardous materials.

The Wampum Wastewater Treatment Facility is located in Wampum Borough. An incident at this facility would affect all residents of Wampum Borough.

Washington Township

US Route 19 passes through Washington Township and is heavily traveled by vehicles transporting hazardous materials.

The D.M. Boyd Company located within Washington Township stores hazardous materials on the premises.

Wayne Township

The CSX Railway passes through Wayne Township. This rail carrier regularly transports hazardous materials through the area.

An incident at the wastewater treatment facility located within Wayne Township would affect both the population and business infrastructure.

Wilmington Township

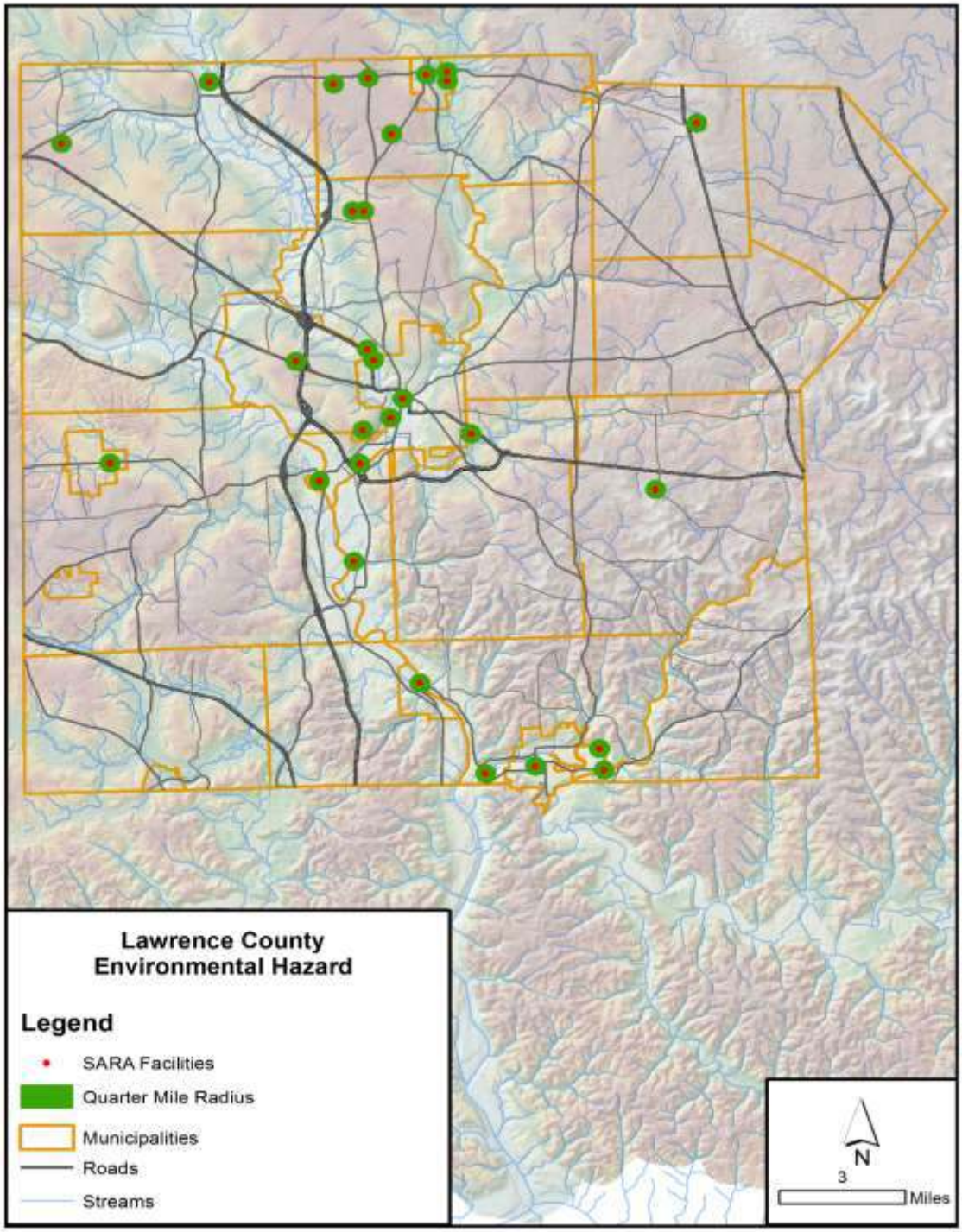
Traffic in the past has been re-routed from Interstate 80, US Route 19, State Route 18, and Interstate 376 through Wilmington Township. Hazardous materials are regularly transported on these routes.

SARA Title III facilities are located within the borders of Wilmington Township. The Agway facility, located in Wilmington Township, stores large quantities of hazardous chemicals and fertilizers.

Table 42 - Gas and Oil Wells

Lawrence County Gas and Oil Wells		
Year	**Permits**	**Drilled**
2010	1	0
2011	8	5
2012	36	17
2013	28	11
2014	83	25

Table 43 - Hazard Vulnerability Map



4.3.19. Nuclear Incidents

4.3.19.1 Location and Extent

There is a Fixed Nuclear Facility (Beaver Valley Power Station) within forty (40) miles of the entire population of Lawrence County. The reception center for evacuees from the Beaver Valley Power Station is located within North Beaver Township.

Nuclear accidents generally refer to events involving the release of significant levels of radioactivity or exposure of workers or the general public to radiation (FEMA, 1997). Nuclear accidents/incidents can be placed into three categories: 1) Criticality accidents which involve loss of control of nuclear assemblies or power reactors, 2) Loss-of-coolant accidents which result whenever a reactor coolant system experiences a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating make-up system and 3) Loss-of-containment accidents which involve the release of radioactivity. The primary concern following such an incident or accident is the extent of radiation, inhalation and ingestion of radioactive isotopes which can cause acute health effects (e.g. death, burns and severe impairment), chronic health effects (e.g. cancer) and psychological effects (FEMA, 1997).

A power reactor facility makes electricity by continuously splitting uranium atoms. Within the Commonwealth of Pennsylvania there are five nuclear power stations. These are:

- Beaver Valley Power Station, Beaver County;
- Limerick Generating Station, Montgomery County;
- Peach Bottom Atomic Power Station, York County;
- Susquehanna Steam Electric Station, Luzerne County; and,
- Three Mile Island Nuclear Generating Station, Dauphin County.

4.3.19.2 Range of Magnitude

In the event of a nuclear facility disaster, radioactive fallout would be the main danger for Lawrence County. Invisible gamma rays from this fallout can cause radiation sickness as a result of physical and chemical changes in the cells of the body. If a person would receive a large dose of radiation, that person would die in a very short time. Non-lethal doses in carrying degrees would cause radiation sickness among the survivors. All of Lawrence County would be in the Ingestion Exposure Pathway. *Table 44 - Emergency Planning Zones* lists the Emergency Planning Zones.

Table 44 - Emergency Planning Zones

Emergency Planning Zones	
EPZ	**Description**
Plume Exposure Pathway	Has a radius of about 10 miles from each reactor site. Predetermined protective action plans are in place and include sheltering, evacuation and the use of potassium iodide where appropriate.
Ingestion Exposure Pathway	Has a radius of about 50 miles from each reactor site. Predetermined protective action plans are in place and are designed to avoid or reduce dose from potential ingestion of radioactive materials. These actions include a ban of contaminated food and water.

Source: U.S. Nuclear Regulatory Commission http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones.html

There are three categories of nuclear accidents:

- Criticality accidents: Involves loss of nuclear assemblies or power reactors.
- Loss of coolant accidents: Occurs when a reactor coolant system experiences a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating make-up system.
- Loss of containment accidents: Involves the release of radioactivity from materials such as tritium, fission products, plutonium and natural, depleted, or enriched uranium.

The Nuclear Regulatory Commission uses four classification levels for nuclear incidents:

- Unusual Event: Events are in process or have occurred which indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.
- Alert: Events are in process or have occurred which involve an actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the EPA Protective Action guides (PAGs).
- Site Area Emergency: Involves events in process or which have occurred that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the EPA PAGs except near the site boundary.
- General emergency: Involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area.

4.3.19.3 Past Occurrence

Lawrence County, so far, has not been affected by a fixed nuclear facility's incident at the Beaver Valley Power Station.

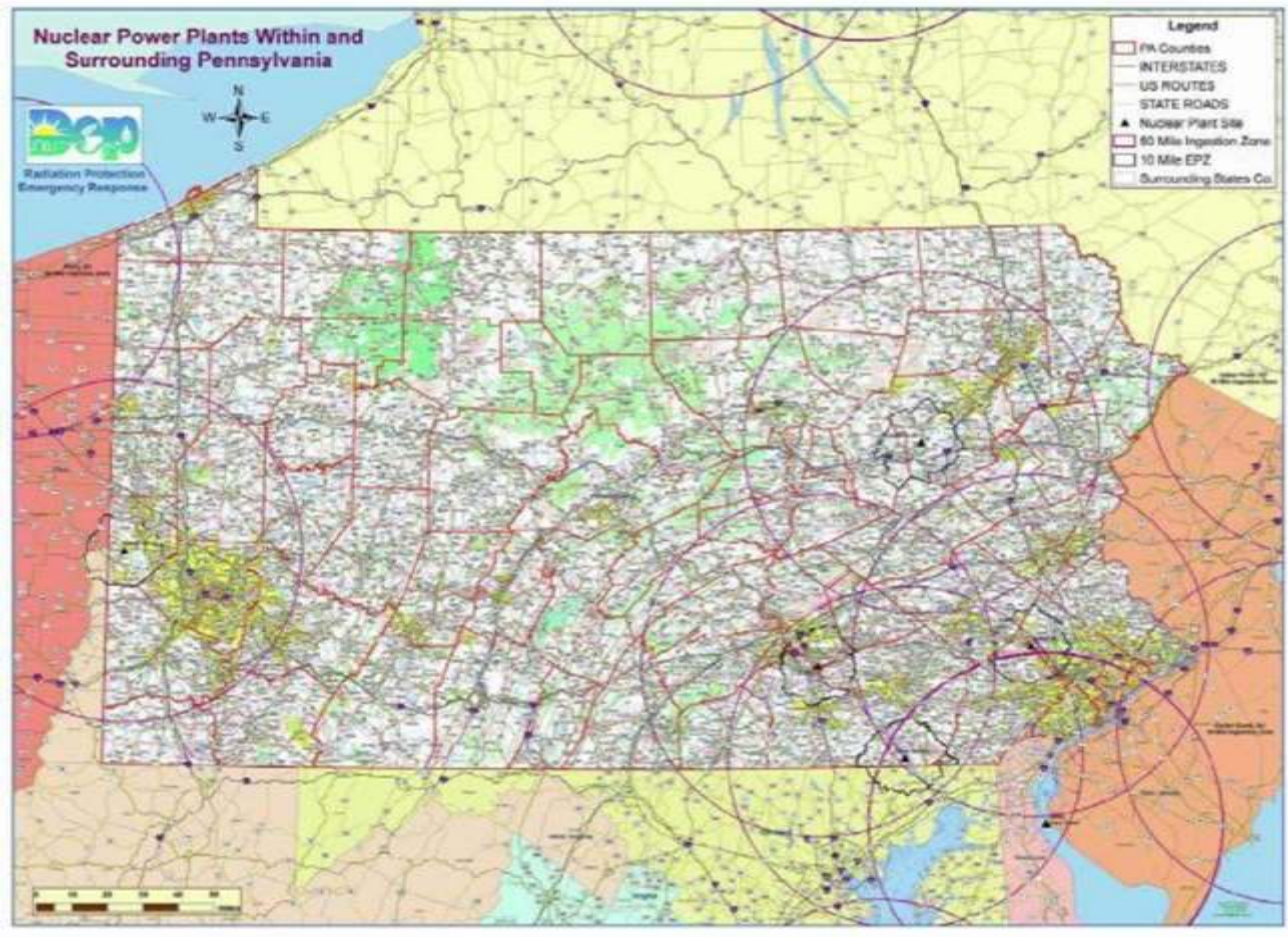
4.3.19.4 Future Occurrence

Lawrence County has minimum potential to be affected by a fixed nuclear facility's incident, but the possibility exists due to the proximity of the Beaver Valley Power Station.

4.3.19.5 Vulnerability Assessment

Lawrence County has potential to be affected by a fixed nuclear facility disaster at the Beaver Valley Power Station. All parts and populations of Lawrence County are within forty (40) miles of the facility. Lawrence County is a support county in the event of a nuclear emergency at the Beaver Valley Power Station. The Beaver Valley Power Station, Beaver County and the Lawrence County Emergency Management Agency have emergency response plans in place for a fixed nuclear incident.

Figure 29 - Pennsylvania Nuclear Power Plants



Sources:

U.S. Nuclear Regulatory Commission- http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones.html

4.3.20. Terrorism

Following several serious international and domestic terrorist incidents during the 1990's and early 2000's, citizens across the United States paid increased attention to the potential for deliberate, harmful actions of individuals or groups. The term "terrorism" refers to intentional, criminal, malicious acts. The functional definition of terrorism can be interpreted in many ways. Officially, terrorism is defined in the Code of Federal Regulations as "*…the unlawful 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 Federal Bureau of Investigation (FBI) further characterizes terrorism as either domestic or international, depending on the origin, base, and objectives of the terrorist organization. However, the origin of the terrorist or person causing the hazard is far less relevant to mitigation planning than the hazard itself and its consequences.

4.3.20.1 Location and Extent

The probability of terrorism occurring cannot be quantified with as great a level of accuracy as that of many natural hazards. Furthermore, these incidents generally occur at a specific location, such as a government building, rather than encompassing an area such as a floodplain. Thus planning should be asset-specific, identifying potentially at-risk critical facilities and systems in the community. Once a comprehensive list of critical assets has been developed, it should be prioritized so that efforts can be directed to protect the most important assets first. Then, beginning with the highest-priority assets, the vulnerabilities of each facility or system to each type of hazard should be assessed.

For the purpose of developing a realistic prioritization of terrorism hazard mitigation projects, three elements should be considered in concert:

- Relative importance of the various facilities and systems in the asset inventory.
- Vulnerabilities of those facilities.
- Threats that are known to exist.

Lawrence County has identified critical facilities located in the county and the hazards to which these facilities are susceptible, however they will not be displayed in this plan and are available at the Department of Public Safety for review by authorized personnel. A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

Critical facilities identified in the county are shelters; gas, electric and communication utilities; hospitals and other health care facilities; water and wastewater treatment plants, hazardous waste sites; and schools.

In addition to critical facilities, the county contains at risk populations that should be factored into a vulnerability assessment.

Critical assets and infrastructures are systems whose incapacity or destruction would have a debilitating effect on the county; this includes:

- Government services
- Emergency services
- Water supply systems
- Transportation networks
- Telecommunications infrastructure
- Electrical power systems
- Gas and oil facilities

4.3.20.2 Range of Magnitude

Terrorism refers to the use of WMD, including, biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and "cyber-terrorism". Within these general categories, however, there are many variations. Particularly in the area of biological and chemical weapons, there are a wide variety of agents and ways for them to be disseminated.

Terrorist methods can take many forms, including:

- Agri-terrorism
- Arson/incendiary attack
- Armed attack
- Biological agent
- Chemical agent
- Cyber-terrorism
- Conventional bomb or bomb threat
- Hazardous material release (intentional)
- Nuclear bomb
- Radiological agent

4.3.20.3 Past Occurrence

According to the Pennsylvania Emergency Incident Reporting System (PEIRS), 58 incidents were reported from 2004 to 2009 and Knowledge Center™ from 2009 to 2014 are illustrated in *Table 45 - PEIRS & Knowledge Center Incidents*.

Table 45 - PEIRS & Knowledge Center Incidents

PEIRS Incidents	
Date	**Type**
05/17/04	School Bomb Threat
08/16/04	Bomb Threat
10/04/04	Bomb Threat
02/01/05	Bomb Threat
05/06/05	School Bomb Threat
05/10/05	Bomb Threat
05/16/05	Bomb Threat
06/06/05	Bomb Threat
06/30/05	Bomb Threat
10/18/05	Hostage Situation
12/06/05	Bomb Threat
03/05/06	Suspicious Substance
03/28/06	Suspicious Substance
04/12/06	Suspicious Activity
06/06/06	School Bomb Threat
06/21/06	Bomb Threat
06/24/06	Bomb Threat
06/27/06	Suspicious Activity
09/19/06	School Bomb Threat
11/14/06	Bomb Threat
04/20/07	School Bomb Threat
04/23/07	School Bomb Threat
04/24/07	School Bomb Threat
04/25/07	School Bomb Threat
04/27/07	School Bomb Threat
05/09/07	School Bomb Threat
06/02/07	Bomb Threat
06/04/07	Bomb Threat
06/25/07	Bomb Threat
09/11/07	School Bomb Threat
09/13/07	School Bomb Threat
09/14/07	School Bomb Threat
09/20/07	School Bomb Threat
09/20/07	Suspicious Substance
09/21/07	School Bomb Threat
09/28/07	School Bomb Threat
10/01/07	School Bomb Threat
10/02/07	Suspicious Substance
10/02/07	School Bomb Threat
10/04/07	School Bomb Threat
10/10/07	School Bomb Threat
10/17/07	School Bomb Threat
10/30/07	School Bomb Threat
11/12/07	School Bomb Threat
11/14/07	School Bomb Threat
11/16/07	School Bomb Threat
11/19/07	School Bomb Threat
12/05/07	Bomb Threat
12/07/07	School Bomb Threat
01/03/08	Bomb Threat
03/14/08	School Bomb Threat

PEIRS Incidents	
Date	**Type**
03/26/08	School Bomb Threat
04/05/08	School Bomb Threat
04/23/08	School Bomb Threat
07/03/08	Bomb Threat
08/10/08	Bomb Threat
10/13/08	Bomb Threat
11/06/08	School Bomb Threat
Knowledge Center™ Incidents	
Date	**Type**
09/16/09	Bomb Threat
11/05/09	School Bomb Threat
10/28/10	School Bomb Threat
04/27/13	Bomb Threat
06/18/13	Bomb Threat
06/19/13	Bomb Threat
10/10/13	Bomb Threat
04/29/14	Bomb Threat - Butler Community College
05/20/14	Bomb Threat - Hospital

4.3.20.4 Future Occurrence

Lawrence County has a minimum risk of terrorism, but the potential certainly exists. There are a number of critical facilities within the county, as well as a nuclear facility in neighboring Beaver County that could affect Lawrence County in the event of a terrorist attack. Because of the close proximity to the risk area, all of Lawrence County may be vulnerable to high levels of radioactive fallout.

4.3.20.5 Vulnerability Assessment

The severity of terrorist incidents depends upon the type of method used, the proximity of the device to people, animals, or other assets and the duration of exposure to the incident or device. For example, chemical agents are poisonous gases, liquids or solids that have toxic effects on people, animals, or plants. Many chemical agents can cause serious injuries or death. Severity of injuries depends on the type and amount of the chemical agent used, and the duration of exposure.

Biological agents are organisms or toxins that have illness-producing effects on people, livestock and crops. Because some biological agents cannot be easily detected and may take time to develop, it is difficult to know that a biological attack has occurred until victims display symptoms. In other cases the effects are immediate. Those affected by a biological agent require the immediate attention of professional medical personnel. Some agents are contagious, and victims may need to be quarantined.

Since the probability of terrorism occurring cannot be quantified in the same way as that of many natural hazards, it is not possible to assess vulnerability in terms of likelihood of occurrence. Instead, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist targets in a community, planning efforts can be put in place to reduce the risk of attack. All communities in Lawrence County are vulnerable on some level, directly or indirectly, to a terrorist attack. However, communities where the previously mentioned potential targets are located should be considered more vulnerable. Site-specific assessments should be based on the relative importance of a particular site to the surrounding community or population, threats that are known to exist, and vulnerabilities including:

Inherent vulnerability:

- Visibility – How aware is the public of the existence of the facility?
- Utility – How valuable might the place be in meeting the objectives of a potential terrorist?
- Accessibility – How accessible is the place to the public?
- Asset mobility – is the asset's location fixed or mobile?
- Presence of hazardous materials – Are flammable, explosive, biological, chemical, and/or radiological materials present on site? If so, are they well secured?
- Potential for collateral damage – What are the potential consequences for the surrounding area if the asset is attacked or damaged?
- Occupancy – What is the potential for mass casualties based on the maximum number of individuals on site at a given time?

Tactical vulnerability:

- Site Perimeter
- Site planning and Landscape Design – Is the facility designed with security in mind – both site- specific and with regard to adjacent land uses?
- Parking Security – Are vehicle access and parking managed in a way that separates vehicles and structures?
- Building Envelope
- Structural Engineering – Is the building's envelope designed to be blast-resistant? Does it provide collective protection against chemical, biological, and radiological contaminants?
- Facility Interior
- Architectural and Interior Space Planning – Does security screening cover all public and private areas?
- Mechanical Engineering – Are utilities and HVAC systems protected and/or backed up with redundant systems?
- Electrical Engineering – Are emergency power and telecommunications available? Are alarm systems operational? Is lightning sufficient?
- Fire Protection Engineering – Are the building's water supply and fire suppression systems adequate, code-compliant, and protected? Are on-site personnel trained appropriately? Are local first responders aware of the nature of the operations at the facility?

- Electronic and Organized Security – Are systems and personnel in place to monitor and protect the facility?

4.3.21. Transportation Accidents

4.3.21.1 Location and Extent

Transportation accidents will claim more lives annually and cause more injuries than any other hazard. With rail, air and highway transportation available all over Pennsylvania, every county in the Commonwealth is susceptible to this hazard. Lawrence County is served by three Interstate Highways (I-76, I-79 and I-376); three U.S. Highways (U.S. Routes 19, US 224 and US 422) and PA State Routes 18, 65, 108, 168, 351, 388 and 551. There are 465.5 miles of state maintained highways and nearly 712 miles of locally owned roads within Lawrence County. Hazardous materials travel through the county daily. The New Castle Area Transit Authority offers public transit.

According to the Federal Railroad Administration, there are four railroads operating in Lawrence County: CSX Transportation, Norfolk Southern Railroad, Buffalo & Pittsburgh Railroad and New Castle Industrial Railroad. Commodity shipments by rail are considered below. The county is also served by the New Castle Municipal Airport in Union Township (which does not see significant cargo shipments). The annual passenger load for the airport is 30,188.
(http://www.newcastlepa.org/Transportation/Airport/airport.html).

Pipelines comprise an element of Lawrence County's commodity flow infrastructure. Most pipelines in the county are gas transmission lines. According to the National Pipeline Mapping System (NPMS), these lines are located on the western side of the county (generally to the west of I-376), the eastern side of the county (generally to the east of SRs 168 and 388) and the southern portion of the county, well south of US 422 (*https://www.npms.phmsa.dot.gov/*). There is also a "hazardous liquid pipeline" in the southwestern corner of the county. This line is owned by Sunoco Pipeline L.P. and is on its "Region 03 Inkster" system. According to the NPMS, the line carries "non-Highly Volatile Liquid (HVL) products".

4.3.21.2 Range of Magnitude

In terms of transportation, the maximum threat to Lawrence 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. These traffic accidents are most common during periods of inclement weather. Significant pipeline accidents are not very common. The most vulnerable areas are those with pipelines running through or along

hillsides. Mudslides and falling rocks can cause pipeline breaks. Hazardous material spills are the most common secondary effect of transportation accidents.

4.3.21.3 Past Occurrence

Lawrence County has witnessed fewer than the state average in automobile accidents from 2007-2013. Fatal accidents in Lawrence County during that three-year period is also below the state average. In 2013, 76 percent of those involved in reported accidents in Lawrence County were wearing a seatbelt. *Table 46 - Automotive Crashes* outlines Lawrence County automobile crash data.

Lawrence County has experienced no aviation accidents recorded by the Federal Aviation Administration (FAA) since 1990.

Table 46 - Automotive Crashes

Lawrence County Automotive Crashes (2007-2013)							
	2007	2008	2009	2010	2011	2012	2013
Total Crashes	829	838	777	773	782	740	748
State Average	1,950	1,870	1,809	1,810	1,871	1852	1853
Fatal Crashes	8	12	8	11	13	10	7
State Average	22	22	19	20	19	18	18
Seatbelt Usage	74%	71%	71%	73%	74%	76%	76%
State Average	75%	76%	77%	77%	78%	78%	78%

Source: Pennsylvania Department of Transportation

4.3.21.4 Future Occurrence

The probability of a transportation accident is highly likely. Automobile accidents, both minor and fatal, will occur more frequently than a pipeline incident or an aviation accident. Roadway accidents occur annually, often with limited impact. The exploration and extraction of natural gas in Lawrence County may lead to an increase of truck and heavy equipment traffic in Lawrence County. A risk factor of 2.6 has been assigned to this hazard utilizing the risk factor methodology probability criteria.

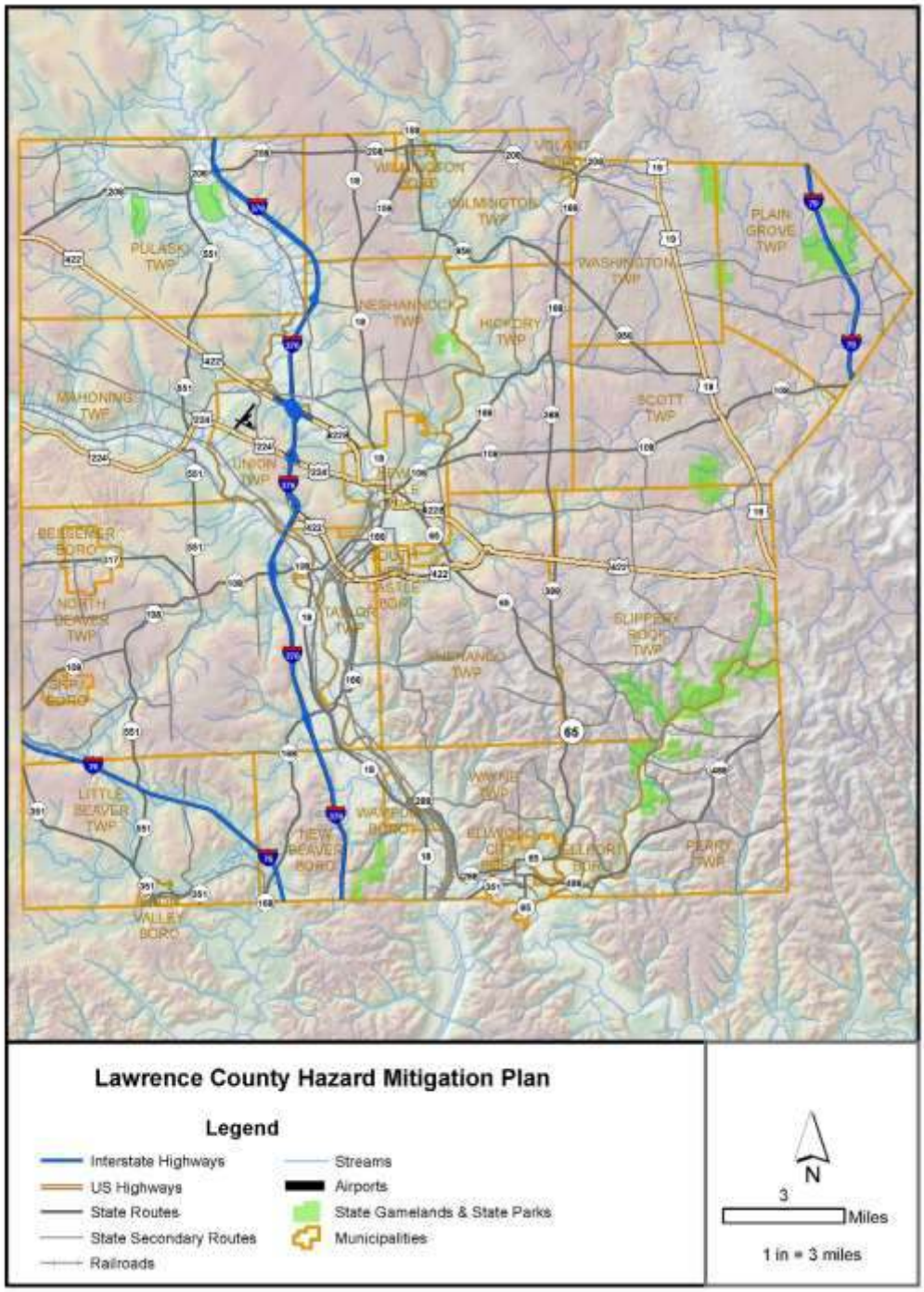
4.3.21.5 Vulnerability Assessment

The vulnerability for a highway accident is directly related to the population and traffic density of that area. The more populated an area the more vulnerable it is to an accident. Interstate Highways (I-76, I-79 and I-376); three U.S. Highways (U.S. Routes 19, US 224 and US 422) and PA State Routes 18, 65, 108, 168, 351, 388 and 551.

Lawrence County's vulnerability to a pipeline break depends on its vulnerability to three other hazards: floods, earthquakes and landslides. Each of these hazards tends to be the primary hazard, while the pipeline break is the secondary hazard. Other hazards

that affect pipelines, that are not as frequent in Lawrence County, include wind storms and tornados.

Figure 30 - Transportation Vulnerability Map



4.3.22. Urban Fire and Explosions

4.3.22.1 Location and Extent

An urban fire involves a structure or property within an urban or developed area. For hazard mitigation purposes, major urban fires involving large buildings and/or multiple properties are of primary concern. Fire can be triggered or exacerbated by other disaster events such as floods, storms, drought, transportation accidents and hazardous materials accidents.

Lawrence County has 22 Fire Departments (20 volunteer, 1 full-time paid [City of New Castle] and one that is partially paid [Ellwood City Borough]).

The potential for a fire is not limited to any one area of Lawrence County. In addition to normal fire hazards a sawmill located in Hickory Township presents a potential fire hazard to the community. Due to the age and proximity of many structures, all areas and populations of Lawrence County can be affected by fire.

Wildfire could affect McConnell's Mill State Park and agricultural areas. Structure (barn) fires could have a substantial effect on the agricultural areas of the county. Also, there is a large Amish population in the area that has been heavily impacted by fire losses.

4.3.22.2 Range of Magnitude

The effects of a major urban fire include minor to significant property damage, loss of life and residential or business displacement. Explosions are extremely rapid releases of energy that usually generate high temperatures and often lead to fires. The risk of severe explosions can be reduced through careful management of flammable and explosive hazardous materials (FEMA, 1997). The worst case based on the information collected would be in 1982 when 7 deaths were recorded. The worst year on record for wildfires was 1987 where 33 incidents were reported.

4.3.22.3 Past Occurrence

Pennsylvania has experienced 13 major urban/suburban fires in the past 80 years. There was a large hazardous materials fire in 1993 at Neomet in Taylor Township. Fire, as a secondary event, may result in very complex situations. Detailed statistics are no longer available concerning the numbers of fire incidents in Pennsylvania and according to the DCNR; only 15% of wildfires are actually reported.

Table 47 - Structure Fires

Summary of Structure Fires in Lawrence County					
Year	**# of Structure Fires**	**Accidental**	**Undetermined**	**Arson**	**Deaths**
1989	108	11	25	72	4
1990	87	13	21	53	1
1991	91	10	47	34	1
1992	72	20	21	31	4
2000	48	Unavailable	Unavailable	Unavailable	Unavailable
Note: Information above is received from figures reported to the State Police Fire Marshal. All fires are not reported due to the unavailability of well documented records by fire companies. Information also received for the monthly reports from PEMA					
2001	4	Unavailable	Unavailable	Unavailable	Unavailable
2002	5	Unavailable	Unavailable	Unavailable	Unavailable
2003	7	Unavailable	Unavailable	Unavailable	Unavailable
2004	3	Unavailable	Unavailable	Unavailable	Unavailable
2005	9	Unavailable	Unavailable	Unavailable	Unavailable
2006	12	Unavailable	Unavailable	Unavailable	Unavailable
2007	55	Unavailable	Unavailable	Unavailable	Unavailable
2008	29	Unavailable	Unavailable	Unavailable	Unavailable
2009	28	Unavailable	Unavailable	Unavailable	Unavailable
Note: Information from 2001 – 2009 was received and reported through the Pennsylvania Emergency Incident Reporting System (PEIRS)					

Year	Total # of Structure Fires	Commercial Buildings	Residential	Multi Family Residential	Other Structure Fires	Fatalities/ Injuries
2010	235	39	176	17	3	0
2011	246	34	183	14	15	1 Fatality 1 injury
2012	275	34	169	34	38	1 Fatality 1 injury
2013	272	32	198	19	23	0
2014	253	35	161	34	23	Unknown
**Data from 2010 to 2014 was obtained from the Lawrence County Computer Aided Dispatch System*						

Also noted from the 2009 to 2013 Lawrence County Knowledge Center™ log was the following information:

- A tire fire on March 25, 2011 in Slippery Rock Township
- A vehicle fire involving hazardous material on August 25, 2012 in Union Township
- A tour bus fire on June 8, 2013 in New Beaver Borough
- A vehicle fire on November 22, 2013, no location given
- A rail car fire on December 10, 2013 in New Castle City
- A locomotive fire on December 24, 2013, no location given.

4.3.22.3 Future Occurrence

Minor fire hazards occur often primarily due to human error. The possibility of wildfire also exists due to the amount of brush and wooded areas that could fuel such a fire. These events have occurred in Lawrence County in the past and will continue to occur in the future. However, the risk should begin to decrease as older, non-code compliant buildings are phased out, unless these structures catch fire through acts of arson or nature prior to being removed.

4.3.22.4 Vulnerability Assessment

The potential for fire damage is not limited to any one area of the county. However, human error can play an important role in creating the potential for a major urban or forest fire. The vulnerability of the citizens and property of Lawrence County to fire and related incidents depends on many factors. A positive factor is the advanced fire services provided within the county. On the negative side, there are many homes and business that have not been updated to current fire safety codes. Each year that these structures go without safety updates, the more at risk they become for a fire incident. In Pennsylvania, the most vulnerable population group was the elderly, age 65 and over and the low-income earners. The elderly had the highest number of deaths resulting from fire and all population groups. The elderly in the county represent a large portion of the population spectrum.

The state fire marshals should focus on strict enforcement of required record keeping by local fire departments. This will aid future analyses and reduce risk. Due to increased training and response by local fire departments, as well as increased public awareness, we hope to see a decrease in the total number of fires each year.

4.3.23. Utility Interruptions

4.3.23.1 Location and Extent

Utility interruptions in Lawrence County include disruptions in fuel, water, electric and telecommunications capabilities in the county, but the primary focus is on electric power failures. Utility interruptions are often a secondary impact of another hazard like severe storms, tornados, winter storms or tropical storms. Severe thunderstorms, tornados and winter storms can also lead to more regional utility interruptions, while localized outages can be caused by traffic accidents or wind damage. Heat waves may also result in rolling blackouts where power may not be available for an extended period of time. Additional utility interruptions may be caused by traffic accidents. Utility interruptions have the potential to take place throughout the county.

Lawrence County Municipal Utility Provider Summary

Electric

Pennsylvania Power Company

Water

Aqua America
Bessemer Borough Water Department
Brent Water Association
Cedar Acres Mobile Home Park
Country Roads Mobile Home Park
Countryside Estates Mobile Home Park
Eastbrook Apartments
Fredericks Mobile Home Park
Freeds Mobile Home Park
Frew Mill Acres Mobile Home Park
Gardenview Mobile Home Park
Green Meadows Mobile Home Park
Heritage Hills Mobile Home Park
Hyland Mobile Home Park
Mahoning Township
Majors Mobile Home Park
New Castle Estates
New Wilmington Borough Water Department
North Star Village
Pennsylvania American Water Co Ellwood City
Pennsylvania American Water Co New Castle
Scottview Terrace Mobile Homes
Villa Maria Community Center
Volant Borough Water Department
Wampum Borough Water Department
Woodmere Estates

Sanitary Sewer

New Castle Sanitation Authority
Bessemer Sewage Authority
Ellport Sewer Authority
Ellwood City Sewage Department
Wampum Sewage Disposal Plant
Wilmington Township Sewer

Gas

Columbia Gas of Pennsylvania
Dominion/Peoples Natural Gas

Telephone

Verizon
CenturyLink
Windstream

Internet

Armstrong
CenturyLink
Comcast
Toast.net
USA Choice
Verizon
Windstream

Cable & Satellite

Armstrong Cable
First Choice
Dish Network

Pipelines*

Columbia Gas of Pennsylvania
Columbia Gas Transmission
Dominion
Harvest Pipeline Co.
Hilcorp Energy Company
Mark West Liberty Midstream & Resources, LLC
National Fuel
Peoples Natural Gas
Sunoco Logistics
Kinder Morgan

Sources:
Resource Data Book
**2012 Emergency Official Manual Pipeline Emergency Response Planning Information for Pennsylvania*
2014 Emergency Responder Manual Pipeline Emergency Response Plan Information

Table 48 - Public Water Supply shows the community public water supply populations and the primary source of that supply for Lawrence County. The remaining residents of Lawrence County receive their water supplies under the purview of the PUC (Public Utility Commission).

Table 48 - Public Water Supply

Community Public Water Supply Populations and Primary Source (DEP, 2013)					
Ground	**Ground or Purchased Ground Under SWI**	**Purchased Ground**	**Purchased Surface**	**Surface**	**Grand total**
3,478	0	0	5,300	60,140	68,918

Source: PA 2013 Approved SSAHMP

4.3.23.2 Range of Magnitude

The special needs population would be at maximum threat, posed by a utility failure in Lawrence County. Loss of resources, such as electricity, communications, gas and water supply could have a serious effect on the 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.

Severe utility interruptions would be regional or widespread power and telecommunications outages. Most often these are short-term outages. The possibility of a large storm hindering the repair of power lines could cause power outages that last several days.

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 have a negative impact on first responders, as well. However, the most critical secondary effect would be the loss of heating compounded by periods of severe cold.

4.3.23.3 Past Occurrence

It is commonly known that utility failures occur annually, at a minimum. The continued documentation of these failures may provide opportunities for the county to mitigate such service failures. *Table 49 - Utility Outages* outlines documented utility outages that have occurred from January 2009 to December 2013.

Table 49 - Utility Outages

Lawrence County Utility Outages		
Utility (reason-if known)	**Date(s) of outage**	**Municipality**
Phone lines out of service	02/25/09 to 02/26/09	New Castle City
Phone outage	03/24/09	Lawrence County
Power outage	03/27/09	Lawrence County
Phone outage	04/13/09	Neshannock Twp.
Sprint & Nextel Cellular 9-1-1- outage	06/29/09 to 06/30/09	Lawrence County
9-1-1/Admin Phone Line outage	07/23/09 to 07/24/09	Lawrence County
Power outage	08/22/09	New Castle City
Phone outage	08/26/09	New Castle City
Power outage	09/20/09	New Castle City
9-1-1 Phone outage	10/03/09 to 10/05/09	New Castle City
Municipal Water Supply outage	10/23/09 to 11/06/09	Volant Borough

Lawrence County Utility Outages		
Utility (reason-if known)	**Date(s) of outage**	**Municipality**
Water Main Break	11/26/09 to 11/27/09	Ellwood City Borough
Temporary 9-1-1 outage	12/13/09	Lawrence County
Power outage	02/06/10 to 03/03/10	Lawrence County
Power outage	02/08/10	Mahoning/Union Twp.
Power outage	03/07/10	Neshannock Twp.
Cellular Phone outage	03/12/10	Lawrence County
Dispatch Radio	04/21/10	Lawrence County
Planned Power Outage	05/19/10 to 05/20/10	New Castle City
Boil Water Advisory	05/25/10 to 06/01/10	New Castle City
Power outage	06/23/10	Lawrence County
Power outage	06/27/10	Union Twp.
Power & Phone outage	07/09/10	Neshannock Twp.
Water Main break	07/22/10	New Castle City
Power outage (semi struck lines)	12/20/10 to 12/27/10	Little Beaver Twp.
Phone outage	01/02/11 to 01/06/11	Lawrence County
Power outage	02/12/11	Neshannock Twp.
Power outage	03/30/11	New Castle City
Power outage	04/12/11	Wilmington Twp.
Power outage	05/09/11	New Castle City
Water supply contamination	06/25/11 to 08/03/11	Pulaski Twp.
Phone outage	11/12/11 to 11/21/11	New Wilmington Borough
Power outage	01/29/12	Ellwood City Borough
Power outage	02/09/12	New Beaver Borough
Natural gas smell	02/28/12 to 03/11/12	New Castle City
Power outage	02/29/12 to 03/01/12	Ellwood City Borough
Power outage	03/10/12	Union Twp.
Power outage	05/28/12 to 05/29/12	Wayne Twp.
Power outage	06/01/12	North Beaver Twp.
Power outage	06/09/12	Shenango Twp.
Power outage	06/14/12	Ellwood City Borough
Planned power outage–Jameson Hospital	06/30/13 to 07/02/12	New Castle City
Power outage	07/09/12 to 07/10/12	Pulaski Twp.
Planned power outage-Jameson Hospital	07/27/12 to 08/13/12	New Castle City
Planned power outage-Jameson Hospital	11/17/12	New Castle City
Widespread Power outage	12/02/12	Lawrence County
Smell of fuel oil in waterway	12/11/12 to 12/13/12	Neshannock Twp.
Phone outage	01/18/13 to 01/19/13	Ellwood City Borough
Power outage	02/07/13	Pulaski Twp.
Power outage	06/23/13 to 6/24/13	Ellwood City Borough
Hospital without water	07/02/13	Ellwood City Borough
Tower Light out	07/21/13 to 08/07/13	Lawrence County
Power outage	07/25/13	Lawrence County
Power outage – large scale	08/06/13	Lawrence County
Gas leak	09/25/13	Lawrence County
Water Leak- Fire System- Nursing Home	11/26/13	Neshannock Twp.
Source: Knowledge Center™ Lawrence County Event Log		

4.3.23.4 Future Occurrence

The probability of a large-scale and extended utility failure is highly likely. Utility interruptions are difficult to predict. Most utility interruptions are secondary to severe

weather. Citizens should always be prepared for these hazards. A risk factor of 2.0 has been assigned to this hazard utilizing the Risk Factor methodology probability criteria.

4.3.23.5 Vulnerability Assessment

Electric

Severe weather is one of the largest causes of power loss. Snow, ice, high winds and lightning can damage the electric power grid infrastructure. Worker strikes have not been known to cause major power outages, however, in some cases, minor power failures have occurred. Other causes of power outages include flooding, falling tree limbs, vehicle accidents involving utility poles and small animals climbing the lines and shorting out the power supply.

When power shortages or failures do occur, they are typically on a regional scale, not simply in a single county. Causes and potential causes include infrastructure failure, sabotage, human error and worker strikes. Also, power outages are often a secondary effect of severe weather. Power outages can damage both homes and businesses. Often, power outages will result in spoiled refrigerated inventories, affecting both residences and businesses.

Water

Water contamination can occur naturally, by human error, or intentionally. Occasionally, releases of manure and milk into the water supply can cause contamination. Overflows from sewage systems and lagoons on farms can also cause contamination of groundwater and drinking water. There are also times when accidental spills and releases of hazardous materials contaminate water. Water supplies along transportation routes may be affected by hazardous materials spills.

Water distribution can be affected in three ways: the amount of water available; the quality of the water; and the viability of the physical components of the distribution systems. The quantity of water depends on nature. Humans, on the other hand, are primarily responsible for the maintenance of water quality. Since Lawrence County is a rural county, a majority of the residential water comes from wells. Well contamination or water shortages due to drought would pose a high vulnerability.

Gas and liquid pipelines

Interruptions to natural gas distribution could be affected by several means: the deterioration of lines and facilities; puncturing the distribution lines by humans (either intentional or accidental); coastal and winter storms; extreme heat or cold events; or transportation accidents. *Table 50 - Pipeline Products* outlines the products that could be transported through Lawrence County.

Table 50 - Pipeline Products

Pipeline Products Transported Through Lawrence County	
Pipeline Company	**Products Transported via Pipelines, DOT Guidebook ID #**
Columbia Gas of Pennsylvania	Natural Gas, 1971
Columbia Gas Transmission	Natural Gas, 1971
Dominion	Natural Gas, 1971 Propane, 1075
National Fuel	Natural Gas, 1971
Peoples Natural Gas	Natural Gas, 1971
Sunoco Logistics	Diesel Fuel, 1993 Fuel Oil, 1993 Fuel, Aviation, Turbine Engine (Jet Fuel or Jet A) 1863 Gasoline, 1203 Kerosene, 1223 Light Cycle Oil, 1993 Low Sulfur Diesel, 1993 Ultra Low Sulfur Diesel, 1993 Ultra Low Sulfur Kerosene, 1223
Kinder Morgan	Natural Gas, 1971
Source: 2012 Emergency Official Manual Pipeline Emergency Response Planning Information for Pennsylvania	

Communications

Cellular communications and coverage is sporadic in the county. Drastic elevation changes, topography issues and a lack of cellular towers in the county lead to a decreased ability to use cellular communications. Cellular communications infrastructure has grown over the past 7 years with additional towers being erected but is still limited.

The primary carrier for land line communications is Verizon. Verizon provides service to most of the municipalities within Lawrence County. Windstream and CenturyLink also service part of the county.

4.4. Hazard Vulnerability Summary

4.4.1. Methodology

Ranking hazards helps communities set goals and priorities for mitigation based on their vulnerabilities. A risk factor (RF) is a tool used to measure the degree of risk for identified hazards in a particular planning area. The RF can also assist local community officials in ranking and prioritizing hazards that pose the most significant threat to a planning area based on a variety of factors deemed important by the planning team and other stakeholders involved in the hazard mitigation planning process. The RF system relies mainly on historical data, local knowledge, general consensus from the planning team and information collected through development of the hazard profiles included in Section 4.3. The RF approach produces numerical values that allow identified hazards to be ranked against one another; the higher the RF value, the greater the hazard risk.

RF values were obtained by assigning varying degrees of risk to five categories for each of the hazards profiled in the HMP update. Those categories include *probability*, *impact*, *spatial extent*, *warning time and duration*. Each degree of risk was assigned a value ranging from one to four. The weighting factor agreed upon by the planning team is shown in *Table 51 - Risk Factor Approach Summary*. To calculate the RF value for a given hazard, the assigned risk value for each category was multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the following example equation:

Risk Factor Value =
[(Probability x .30) + (Impact x .30) +(Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10)]

Table 51 - Risk Factor Approach Summary summarizes each of the five categories used for calculating a RF for each hazard. According to the weighting scheme applied, the highest possible RF value is 4.0.

Table 51 - Risk Factor Approach Summary

Summary of Risk Factor Approach Used to Rank Hazard Risk.					
RISK ASSESSMENT CATEGORY	**DEGREE OF RISK**				**WEIGHT VALUE**
	LEVEL	**CRITERIA**		**INDEX**	
PROBABILITY *What is the likelihood of a hazard event occurring in a given year?*	**UNLIKELY**	LESS THAN 1% ANNUAL PROBABILITY		1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY		2	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY		3	
	HIGHLY LIKELY	100% ANNUAL PROBABILTY		4	
IMPACT *In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?*	**MINOR**	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.		1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.		2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.		3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.		4	
SPATIAL EXTENT *How large of an area could be impacted by a hazard event? Are impacts localized or regional?*	**NEGLIGIBLE**	LESS THAN 1% OF AREA AFFECTED		1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED		2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED		3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED		4	
WARNING TIME *Is there usually some lead time associated with the hazard event? Have warning measures been implemented?*	**MORE THAN 24 HRS**	SELF-DEFINED	*(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)*	1	10%
	12 TO 24 HRS	SELF-DEFINED		2	
	6 TO 12 HRS	SELF-DEFINED		3	
	LESS THAN 6 HRS	SELF-DEFINED		4	
DURATION *How long does the hazard event usually last?*	**LESS THAN 6 HRS**	SELF-DEFINED	*(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)*	1	10%
	LESS THAN 24 HRS	SELF-DEFINED		2	
	LESS THAN 1 WEEK	SELF-DEFINED		3	
	MORE THAN 1 WEEK	SELF-DEFINED		4	

4.4.2. Ranking Results

Using the methodology described in Section 4.4.1, *Table 52 - Risk Factor Assessment* lists the Risk Factor calculated for each of the twenty three (23) potential hazards identified in the 2015 HMP. *It should be noted that the tornado hazard and windstorm hazard were ranked individually instead of together*. Hazards identified as *high* risk have risk factors greater than 2.5. Risk Factors ranging from 2.0 to 2.4 were deemed *moderate* risk hazards. Hazards with Risk Factors 1.9 and less are considered *low* risk.

Table 52 - Risk Factor Assessment

Lawrence County Hazard Ranking Based on RF Methodology.							
HAZARD RISK	HAZARD NATURAL(N) OR MAN-MADE(M)	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		PROBABILITY	ECONOMIC IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Environmental hazards (M)	4	3	2	4	3	3.3
	Winter Storms (N)	4	2	3	2	1	3.1
	Flood, Flash Flood,Ice Jams (N)	4	2	3	2	3	2.8
	Wind storms (N)	3	2	4	1	1	2.8
	Invasive Species (N)	4	2	2	1	4	2.6
	Drought (N)	3	1	4	1	4	2.6
	Disorientation (M)	4	1	4	3	1	2.6
	Transportation Accidents (M)	4	2	1	4	2	2.6
	Radon (N)	3	1	4	1	4	2.5
MODERATE	Urban Fire and Explosions (M)	4	1	2	4	1	2.4
	Nuclear (M)	2	1	1	4	4	2.4
	Tornados (N)	1	4	2	4	1	2.4
	Earthquakes (N)	1	2	4	4	1	2.4
	Drowning (M)	4	1	1	4	2	2.3
	Wildfire (N)	3	1	2	4	3	2.3
	Lightning Strikes (N)	4	1	1	4	1	2.2
	Civil Disturbance (M)	3	1	1	4	2	2.2
	Pandemic & Infectious Disease (N)	2	1	4	1	4	2.2
	Terrorism (M)	1	3	3	3	1	2.2
	Extreme Temperatures (N)	4	1	1	1	3	2.1
	Utility Interruptions (M)	3	1	1	4	2	2.0
LOW	Dam Failure (M)	1	2	2	4	2	1.9
	Hurricane/Tropical Storm (N)	1	1	4	1	3	1.8
	Landslides (N)	2	1	1	4	1	1.6

Based on these results, there are nine (9) *high* risk hazards, twelve (12) *moderate* risk hazards and three (3) *low* risk hazards in Lawrence County. Mitigation actions were developed for all high, moderate and low risk hazards (see Section 6.4). The threat posed to life and property for moderate and high risk hazards is considered significant enough

to warrant the need for establishing hazard-specific mitigation actions. Mitigation actions related to future public outreach and emergency service activities are identified to address low risk hazard events.

A risk assessment result for the entire county does not mean that each municipality is at the same amount of risk to each hazard. *Table 53 - Countywide Risk Factor by Hazard* shows the different municipalities in Lawrence County and whether their risk is greater than (>), less than (<), or equal to (=) the risk factor assigned to the county as a whole. This table was developed by the consultant based on the findings in the hazard profiles located in sections 4.3.1 through 4.3.23.

Table 53 - Countywide Risk Factor by Hazard

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Environmental Hazards (M)	Winter Storms (N)	Flood, Flash Flood, Ice Jams (N)	Windstorms (N)	Invasive Species (N)	Drought (N)	Transportation Accidents (M)	Disorientation (M)	Radon Exposure (N)
	3.3	***3.1***	***2.8***	***2.8***	***2.6***	***2.6***	***2.6***	***2.6***	***2.5***
City of New Castle	=	=	>	=	=	<	=	<	=
Bessemer Borough	=	=	<	=	=	<	=	<	=
Ellport Borough	=	=	<	=	=	<	=	<	=
Ellwood City Borough	=	=	>	=	=	<	=	<	=
Enon Valley Borough	=	=	<	=	=	<	=	<	=
New Beaver Borough	=	=	<	=	=	<	=	<	=
New Wilmington Borough	=	=	<	=	=	<	=	<	=
SNPJ Borough	=	=	<	=	=	<	=	<	=
South New Castle Borough	=	=	>	=	=	<	=	<	=
Volant Borough	=	=	>	=	=	<	=	<	=
Wampum Borough	=	=	>	=	=	<	=	<	=
Hickory Township	=	=	>	=	=	>	=	=	=
Little Beaver Township	=	=	<	=	=	>	=	=	=
Mahoning Township	=	=	>	=	=	>	=	=	=
Neshannock Township	=	=	>	=	=	>	=	>	=
North Beaver Township	=	=	<	=	=	>	=	>	=
Perry Township	=	=	<	=	=	>	=	=	=
Plain Grove Township	=	=	<	=	=	>	=	=	=
Pulaski Township	=	=	<	=	=	>	=	>	=
Scott Township	=	=	>	=	=	>	=	>	=
Shenango Township	=	=	>	=	=	>	=	=	=
Slippery Rock Township	=	=		=	=	>	=	>	=
Taylor Township	=	=	=	=	=	>	=	=	=
Union Township	=	=	>	=	=	>	=	=	=
Washington Township	=	=	<	=	=	>	=	=	=
Wayne Township	=	=	>	=	=	>	=	=	=
Wilmington Township	=	=	>	=	=	>	=	=	=

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk															
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR															
JURISDICTION	Urban Fire & Explosion (N)	Nuclear (M)	Tornado (N)	Earthquakes (N)	Drowning (N)	Wildfire (N)	Lightning Strike (N)	Pandemic (N)	Terrorism (M)	Civil Disturbance (M)	Extreme Temperatures (N)	Utility Interruptions (M)	Hurricane / Tropical Storm (N)	Dam Failure (M)	Landslides (N)
	2.4	*2.4*	*2.4*	*2.4*	*2.3*	*2.3*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.0*	*1.8*	*1.9*	*1.6*
City of New Castle	>	=	=	=	=	<	=	=	=	=	=	=	=	=	<
Bessemer Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Ellport Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Ellwood City Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Enon Valley Boro	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
New Beaver Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
New Wilmington Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
SNPJ Boro	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=
So New Castle Boro	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Volant Boro	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Wampum Boro	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=
Hickory Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Little Beaver Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Mahoning Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Neshannock Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
North Beaver Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Perry Twp.	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Plain Grove Twp.	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Pulaski Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Scott Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Shenango Twp.	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Slippery Rock Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Taylor Twp.	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Union Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Washington Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Wayne Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=
Wilmington Twp.	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=

4.4.3. Potential Loss Estimates

Flooding Loss Estimation:

Flooding is a high risk natural hazard in Lawrence County. The estimation of potential loss in this assessment focuses on the monetary damage that could result from flooding. The potential property loss was determined for each municipality and for the entire county. The following primary datasets were utilized for this estimated potential loss analysis: Flood Insurance Rate Maps, Lawrence County Structures, Lawrence County Municipal Boundaries and the Lawrence County Tax Assessment Database.

The Lawrence County Assessment Office houses a dataset with the total assessed value for each tax parcel throughout the county. Estimated potential losses were calculated by first determining what tax parcels and structures were intersected by the 1% annual chance floodplain. Once the impacted parcel and structures were identified, then primary residence structures and commercial structures were identified. Lawrence County has seasonal structures that are located in the 1% annual chance special flood hazard area. These seasonal structures were not included in the estimation of loss. The county assessed value for all primary residences and commercial structures located in the 1% annual chance special flood hazard area was determined. The total of both land assessed value and the building assessed value provides a total assessed value for that property. The total assessed value for each parcel in a municipality was tallied to derive the total assessed value per municipality for every structure that was located in the 1% annual chance special flood hazard area.

Table 54 - Potential Municipal Flood Loss Estimates outlines the potential flooding losses for each municipality. Losses shown here can only be viewed as estimates and as potential, based on the random occurrence of flood conditions and limited data. Assessed value and market value data include those based on a point within a two-dimensional (latitude and longitude) plane. This data, however, does not include attribute information on first-floor flood elevations, which is essential to assess the base flood elevation's impact on the county's infrastructure. Further, this analysis assumes a total loss for any parcel intersected by the floodplain. As a result of these limitations, the estimates are likely overstated, but to what degree the potential losses are overstated cannot be determined. The quantity of commercial and residential structures in each Lawrence County municipality is outlined in section 4.3.4 of the flooding hazard profile.

MCM Consulting Group conducted a county wide flood study using the Hazards U.S. Multi-Hazard (HAZUS-MH) software that is provided by the Federal Emergency Management Agency. This software is a standardized loss estimation software deriving economic loss, building damage, content damage and other economic impacts that can be used in local flood mitigation planning activities.

Using HAZUS-MH, total building-related losses from a 1%-annual-chance flood in Lawrence County are estimated to equal $468,240,000. Residential occupancies make up

23.15% of the total estimated building-related losses. Total economic loss, including replacement value, content loss, functional loss and displacement cost, from a county-wide 1%-annual-chance flood are estimated to equal $469,950,000.

Table 54 - Potential Municipal Flood Loss Estimates

Addressable and Other Properties in the Floodplain			
Municipality	**Addressable**	**Other**	**Building Assessed Value Totals**
City of New Castle	$2,456,600.00	$36,137,500.00	$38,594,100.00
Bessemer Borough	$55,700.00	$4,785,200.00	$4,840,900.00
Ellport Borough	$0.00	$0.00	$0.00
Ellwood City Borough	$335,900.00	$0.00	$335,900.00
Enon Valley Borough	$53,300.00	$0.00	$53,300.00
New Beaver Borough	$92,300.00	$240,000.00	$332,300.00
New Wilmington Borough	$0.00	$0.00	$0.00
S.N.P.J. Borough	$0.00	$0.00	$0.00
South New Castle Borough	$0.00	$0.00	$0.00
Volant Borough	$77,300.00	$711,500.00	$788,800.00
Wampum Borough	$361,800.00	$89,400.00	$451,200.00
Hickory Township	$1,736,800.00	$0.00	$1,736,800.00
Little Beaver Township	$525,900.00	$0.00	$525,900.00
Mahoning Township	$801,700.00	$86,300.00	$888,000.00
Neshannock Township	$269,800.00	$202,300.00	$472,100.00
North Beaver Township	$1,183,200.00	$0.00	$1,183,200.00
Perry Township	$236,900.00	$0.00	$236,900.00
Plain Grove Township	$363,500.00	$0.00	$363,500.00
Pulaski Township	$115,300.00	$1,572,300.00	$1,687,600.00
Scott Township	$1,537,200.00	$0.00	$1,537,200.00
Shenango Township	$616,100.00	$1,699,000.00	$2,315,100.00
Slippery Rock Township	$630,100.00	$0.00	$630,100.00
Taylor Township	$59,100.00	$7,312,300.00	$7,371,400.00
Union Township	$83,400.00	$0.00	$83,400.00
Washington Township	$0.00	$0.00	$0.00
Wayne Township	$5,003,800.00	$63,800.00	$5,067,600.00
Wilmington Township	$1,609,000.00	$114,200.00	$1,723,200.00
Lawrence County	$18,204,700.00	$53,013,800.00	$71,218,500.00

Severe Wind Storm and Tornado Loss Estimation:

Table 55 - Wind & Tornado Loss Estimates, outlines the potential losses for each municipality due to a high wind related event. Losses shown here can only be viewed as estimates and as potential, based on the random occurrence of wind conditions and the limitations of data. Assessed value data include those based on a point within a two-dimensional (latitude and longitude) plane. Further, this analysis assumes a total loss of a property that is designated as a mobile home property. As a result of these limitations, the estimates are likely overstated, but to what degree the potential losses are overstated cannot be determined.

Table 55 - Wind & Tornado Loss Estimates

Wind and Tornado Estimation of Loss		
Municipality	**Residences**	**Assessed Value**
Hickory Township	118	$2,115,500
Little Beaver Township	48	$632,800
Mahoning Township	200	$1,862,300
Neshannock Township	22	$126,700
New Beaver Borough	70	$541,700
North Beaver Township	51	$514,700
Plain Grove Township	8	$83,300
Pulaski Township	157	$1,364,900
Scott Township	49	$934,200
Shenango Township	60	$449,050
Slippery Rock Township	63	$401,400
South New Castle	10	$82,500
Taylor Township	7	$47,000
Union Township	73	$861,500
Wampum Borough	1	$24,900
Wayne Township	35	$566,600
Total	**972**	**$10,609,050**

4.4.4. Future Development and Vulnerability

While it has been documented that many of Lawrence County's older boroughs and villages have experienced little or no increase in development activity due to the fact that there is limited undeveloped land remaining in those municipalities, a number of communities throughout the County have experienced slow steady growth in the past two decades.

Growth is considered primarily residential because of past trends and the small percentage of commercial and industrial subdivision application submittals. The top ten municipalities in respect to growth during the last two decades are as follows:

1. Neshannock Township
2. Slippery Rock Township
3. Shenango Township

4. North Beaver Township
5. Wilmington Township
6. Scott Township
7. Pulaski Township
8. Perry Township
9. Hickory Township
10. Mahoning Township

It is interesting to note that geographically the municipalities experiencing the most consistent rates of activity are not in any specific area of the county. While three of the top five townships and six of the top ten are on the eastern side of New Castle, the busiest township is north of the City and the remaining three townships are on the western side of New Castle. Specific information on types and numbers of future structures was not available at the time of this update.

The 1980's was a decade of out-migration due to the loss of a significant number of manufacturing and support jobs. The number of new land developments and residential subdivisions reflected a transition from heavy industry to high-tech employment with the focus on service sector jobs, medical technology employment, and transportation and public utility jobs. Within each part of the County, land is available for non-residential development with access to high volume arterial roadways or railways. Capacity in existing utility systems, however, whether on-site or off, is an issue which must be addressed both locally and at the county level if additional commercial and industrial development will continue to occur.

5. Capability Assessment

5.1. Update Process Summary

The capability assessment is an evaluation of Lawrence County's governmental structure, political framework, legal jurisdiction, fiscal status, policies and programs, regulations and ordinances and resource availability. Each category is evaluated for its strengths and weaknesses in responding to, preparing for and mitigating the effects of the profiled hazards. The capability assessment has two components: an inventory of the county's and municipalities' mission, programs and policies; and an analysis of their capacity to execute them. A capability assessment is an integral part of the hazard mitigation planning process. Here, the County and municipalities identify, review and analyze what they are currently doing to reduce losses and identify the framework necessary to implement new mitigation actions. This information will help the County and municipalities evaluate alternative mitigation actions and address shortfalls in the mitigation plan.

A capabilities assessment matrix/questionnaire was provided to the municipalities during the planning process at meetings of Lawrence County officials. These meetings were designed to seek input from key county and municipal stakeholders on legal, fiscal, technical and administrative capabilities of all jurisdictions. As such, the capabilities assessment helps guide the implementation of mitigation projects and will help evaluate the effectiveness of existing mitigation measures, policies, plans, practices and programs.

Throughout the planning process, the mitigation local planning team considered the county's 27 municipalities. Pennsylvania municipalities have their own governing bodies, pass and enforce their own ordinances and regulations, purchase equipment and manage their own resources, including critical infrastructure. These capability assessments, therefore, consider the various characteristics and capabilities of municipalities under study. Additionally, NFPA 1600 recommends that a corrective action program be established to address shortfalls and provide mechanisms to manage the capabilities improvement process.

The evaluation of the categories listed above – political framework, legal jurisdiction, fiscal status, policies and programs and regulations and ordinances – allows the mitigation planning team to determine the viability of certain mitigation actions. The capability assessment analyzes what Lawrence County and its municipalities have the capacity to do and provides an understanding of what must be changed to mitigate loss.

Lawrence County has a number of resources it can access to implement hazard mitigation initiatives including emergency response measures, local planning and regulatory tools, administrative assistance and technical expertise, fiscal capabilities and participation in local, regional, state and federal programs. The presence of these resources

enables community resiliency through actions taken before, during and after a hazardous event. While the capability assessment serves as a good instrument for identifying local capabilities, it also provides a means for recognizing gaps and weaknesses that can be resolved through future mitigation actions. The results of this assessment lend critical information for developing an effective mitigation strategy.

5.2. Capability Assessment Findings

All participating municipalities completed and submitted a capability assessment survey. The results of the survey were collected, aggregated and analyzed.

5.2.1. Emergency Management

The Lawrence County Department of Public Safety coordinates countywide emergency management efforts. Each municipality has a designated local emergency management coordinator who possesses a unique knowledge of the impact hazard events have on their community.

The Emergency Management Services Code (PA Title 35) requires that all municipalities in the Commonwealth have a local emergency operations plan (EOP) which is updated every two years. Each municipality is required to adopt the countywide EOP. The Notification and Resource Section of the plan was developed individually by each municipality. A copy of each EOP is on file with the Department of Public Safety. Lawrence County updates the EOP every 5 years. The next update will occur in 2016.

5.2.2. Participation in the National Flood Insurance Program (NFIP)

Floodplain management is the operation of programs or activities that may consist of both corrective and preventive measures for reducing flood damage, including but not limited to such things as emergency preparedness plans, flood control works and flood plain management regulations. The Pennsylvania Floodplain Management Act (Act 166) requires every municipality identified by the Federal Emergency Management Agency (FEMA) to participate in the National Flood Insurance Program (NFIP) and permits all municipalities to adopt floodplain management regulations. It is in the interest of all property owners in the floodplain to keep development and land usage within the scope of the floodplain regulations for their community. This helps keep insurance rates low and makes sure that the risk of flood damage is not increased by property development.

The Pennsylvania DCED provides communities, based on their CFR, Title 44, Section 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP along with the Pennsylvania Flood Plain Management Act (Act 166). These suggested or model ordinances contain provisions that are more restrictive than state and federal requirements. Suggested provisions include, but are not limited to:

- Prohibiting manufactured homes in the floodway.
- Prohibiting manufactured homes within the area measured 50 feet landward from the top-of bank of any watercourse within a special flood hazard area.
- Special requirements for recreational vehicles within the special flood hazard area.
- Special requirement for accessory structures.
- Prohibiting new construction and development within the area measured 50 feet landward from the top-of bank of any watercourse within a special flood hazard area.
- Providing the County Conservation District an opportunity to review and comment on all applications and plans for any proposed construction or development in any identified floodplain area.

Act 166 mandates municipal participation in and compliance with the NFIP. It also establishes higher regulatory standards for new or substantially improved structures which are used for the production or storage of dangerous materials (as defined by Act 166) by prohibiting them in the floodway. Additionally, Act 166 establishes the requirement that a Special Permit be obtained prior to any construction or expansion of any manufactured home park, hospital, nursing home, jail and prison if said structure is located within a special flood hazard area.

The NFIP's Community Rating System (CRS) provides discounts on flood insurance premiums in those 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 floodplains.

The CRS was implemented in 1990 to recognize and encourage community floodplain management activities that exceed the minimum NFIP standards. Section 541 of the 1994 Act amends Section 1315 of the 1968 Act to codify the Community Rating System in the NFIP. The section also expands the CRS goals to specifically include incentives to reduce the risk of flood-related erosion and to encourage measures that protect natural and beneficial floodplain functions. These goals have been incorporated into the CRS and communities now receive credit toward premium reductions for activities that contribute to them.

Under the Community Rating System, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet a minimum of three of the following CRS goals:

- Reduce flood losses
- Protect public health and safety
- Reduce damage to property
- Prevent increases in flood damage from new construction
- Reduce the risk of erosion damage

- Protect natural and beneficial floodplain functions
- Facilitate accurate insurance rating
- Promote the awareness of flood insurance

There are 10 Community Rating System classes. Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction. CRS premium discounts on flood insurance range from five percent for Class 9 communities up to 45 percent for Class 1 communities. The CRS recognizes 18 credible activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction and Flood Preparedness.

FEMA Region III makes available to communities, an ordinance review checklist which lists required provisions for floodplain management ordinances. This checklist helps communities develop an effective floodplain management ordinance that meets federal requirements for participation in the NFIP. The Pennsylvania Department of Community and Economic Development (DCED) provides communities, based on their 44 CFR 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP and the Pennsylvania Flood Plain Management Act (Act 166). Act 166 mandates municipal participation in and compliance with the NFIP. It also establishes higher regulatory standards for hazardous materials and high risk land uses. As new Digital Flood Insurance Rate Maps (DFIRMs) are published, the Pennsylvania State NFIP Coordinator at DCED works with communities to ensure the timely and successful adoption of an updated floodplain management ordinance by reviewing and providing feedback on existing and draft ordinances.

Table 56 - Planning Tool Summary

Summary of Planning Tools Adopted by Each Municipality in Lawrence County (HMP Capability Assessment Surveys, 2013; Lawrence County Planning Department 2013)									
COMMUNITY	**COMPREHENSIVE PLAN**	**PLAN YEAR ADOPTED**	**BUILDING CODE**	**NFIP PARTICIPANT**	**FLOODPLAIN ORDINANCE**	**SUBDIVISION & LAND DEVELOPMENT ORDINANCE**	**SALDO YEAR ADOPTED**	**ZONING ORDINANCE**	**ZONING YEAR ADOPTED**
Bessemer Borough	No		Yes	Yes	Yes	Yes		Yes	
Ellport Borough	No		Yes	Yes	Yes	No	N/A	Yes	1997
Ellwood City Borough	Yes		Yes	Yes	Yes	Yes		Yes	
Enon Valley Borough	No		Yes	Yes	Yes	No		No	
Hickory Township	No		No	Yes	Yes	Yes		Yes	
Little Beaver Township	No		Yes	Yes	Yes	No		No	
Mahoning Township	Yes		Yes	Yes	Yes	Yes		Yes	
Neshannock Township	Yes	2004	Yes	Yes	Yes	Yes	1969	Yes	2013
New Beaver Borough	Yes		Yes	Yes	Yes	Yes		Yes	
City of New Castle	Yes	2005	Yes	Yes	Yes	Yes		Yes	
New Wilmington Borough	Yes		Yes	Yes	Yes	Yes		Yes	
North Beaver Township	Yes		No	Yes	Yes	Yes		Yes	
Perry Township	No		Yes	Yes	Yes	Yes	2007	No	
Plain Grove Township	Yes		No	Yes	Yes	No		Yes	
Pulaski Township	Yes		Yes	Yes	Yes	Yes	2007	Yes	
Scott Township	No		No	Yes	Yes	Yes		No	
Shenango Township	Yes		Yes	Yes	Yes	Yes		Yes	
Slippery Rock Township	No		No	Yes	Yes	Yes		No	
South New Castle Borough	No		No	Yes	Yes	No		No	
S.N.P.J. Borough	No		No	No	Yes	No		No	
Taylor Township	No		No	Yes	Yes	Yes		Yes	
Union Township	Yes		No	Yes	Yes	Yes		Yes	
Volant Borough	Yes		Yes	Yes	Yes	No		Yes	
Wampum Borough	Yes		Yes	Yes	Yes	No		Yes	2010
Washington Township	No		No	Yes	Yes	No		No	
Wayne Township	Yes		No	Yes	Yes	Yes		Yes	2014
Wilmington Township	No		No	Yes	Yes	Yes		Yes	

5.2.3. Planning and Regulatory Capability

Municipalities have the authority to govern more restrictively than state and county minimum requirements; as long as they are in compliance with all criteria established in the Pennsylvania Municipalities Planning Code (MPC) and their respective municipal codes. Municipalities can develop their own policies and programs and implement their

own rules and regulations to protect and serve their local residents. Local policies and programs are typically identified in a comprehensive plan, implemented through a local ordinance and enforced by the governmental body or its appointee.

Municipalities regulate land use via the adoption and enforcement of zoning, subdivision and land development, building codes, building permits, floodplain management and/or stormwater management ordinances. When effectively prepared and administered, these regulations can lead to an opportunity for hazard mitigation. For example, the National Flood Insurance Program (NFIP) established minimum floodplain management criteria. Adoption of the Pennsylvania Floodplain Management Act (Act 166 of 1978) established higher standards. A municipality must adopt and enforce these minimum criteria to be eligible for participation in the NFIP. Municipalities have the option of adopting a single-purpose ordinance or incorporating these provisions into their zoning, subdivision and land development, or building codes; thereby mitigating the potential impacts of local flooding. This capability assessment details the existing Lawrence County and municipal legal capabilities to mitigate the profiled hazards. It identifies the county's and the municipalities' existing planning documents and their hazard mitigation potential. Hazard mitigation recommendations are, in part, based on the information contained in the assessment. *Table 56 - Planning Tool Summary* outlines the municipal capability assessment survey results for zoning, subdivision and land development, building codes, floodplain management and comprehensive planning.

Building Codes

Building codes are important in mitigation because they are developed for a region of the country in respect to the hazards existing in that area. Consequently, structures that are built according to applicable codes are inherently resistant to many hazards, such as strong winds, floods and earthquakes; and can help mitigate regional hazards, such as wildfires. In 2003, Pennsylvania implemented the Uniform Construction Code (UCC) (Act 45), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures.

The code applies to almost all buildings, excluding manufactured and industrialized housing (which are covered by other laws), agricultural buildings and certain utility and miscellaneous buildings. The UCC has many advantages. It requires builders to use materials and methods that have been professionally evaluated for quality and safety, as well as inspections to ensure compliance.

The initial election period, during which all of Pennsylvania's 2,565 municipalities were allowed to decide whether the UCC would be administered and enforced locally, officially closed on August 7, 2004. The codes adopted for use under the UCC are the 2003 International Codes issued by the International Code Council (ICC). Supplements to the 2003 codes have been adopted for use over the years since.

If a municipality has "opted in", all UCC enforcement is local, except where municipal (or third party) code officials lack the certification necessary to approve plans and inspect commercial construction for compliance with UCC accessibility requirements. If a municipality has "opted out", the PA Department of Labor and Industry is responsible for all commercial code enforcement in that municipality; and all residential construction is inspected by independent third party agencies selected by the owner. The department also has sole jurisdiction for all state-owned buildings no matter where they are located. Historical buildings may be exempt from such inspections and Act 45 provides quasi-exclusion from UCC requirements.

The municipalities in Lawrence County adhere to the standards of the Pennsylvania Uniform Construction Code (Act 45).

The following municipalities are under agreement with the Lawrence County Regional Council of Governments to use Code.sys (1-877-821-0337) to enforce the Uniform Construction Code and issue building permits:

Bessemer Borough
Ellport Borough
Ellwood City Borough
Enon Valley Borough
Hickory Township
Little Beaver Township
Mahoning Township
City of New Castle
New Wilmington Borough
North Beaver Township
Perry Township
Pulaski Township
Slippery Rock Township
Union Township
Volant Borough
Wilmington Township

Property owner or builder must go to the PA Department of Labor and Industry to obtain building permit for the following municipalities:

Neshannock Township
Scott Township
South New Castle Borough
SNPJ Borough

The following municipalities use a third party to enforce the Uniform Construction Code - check with municipality for third party name:

New Beaver Borough

Plain Grove Township
Shenango Township
Wampum Borough
Taylor Township
Washington Township
Wayne Township

Zoning Ordinance

Article VI of the Municipalities Planning Code (MPC) authorizes municipalities to prepare and enact zoning to regulate land use. Its regulations can apply to: the permitted use of land; the height and bulk of structures; the percentage of a lot that may be occupied by buildings and other impervious surfaces; yard setbacks; the density of development; the height and size of signs; the parking regulations. A zoning ordinance has two parts, including the zoning map that delineates zoning districts and the text that sets forth the regulations that apply to each district. Lawrence County has a county zoning ordinance. See *Table 57 - Planning and Regulatory Capability.*

Table 57 - Planning and Regulatory Capability

Planning & Regulatory Capability	Implementation
Comprehensive Plan	52%
Zoning Regulations	52%
Subdivision Regulations	78%
Floodplain Regulations	97%
National Flood Insurance Program	97%

Subdivision Ordinance

Subdivision and land development ordinances include regulations to control the layout of streets, the planning of lots and the provision of utilities and other site improvements. The objectives of a subdivision and land development ordinance are to: coordinate street patterns; assure adequate utilities and other improvements are provided in a manner that will not pollute streams, wells and/or soils; reduce traffic congestion; and provide sound design standards as a guide to developers, the elected officials, planning commissions and other municipal officials. Article V of the Municipality Planning Code authorizes municipalities to prepare and enact a subdivision and land development ordinance. Subdivision and land development ordinances provide for the division and improvement of land. See *Table 56 - Planning Tool Summary*.

Stormwater Management Plan/Stormwater Ordinance

The proper management of stormwater runoff can improve conditions and decrease the chance of flooding. Pennsylvania's Storm Water Management Act (Act 167) confers on counties the responsibility for development of watershed plans. The Act specifies that

counties must complete their watershed stormwater plans within two years following the promulgation of these guidelines by the DEP, which may grant an extension of time to any county for the preparation and adoption of plans. Counties must prepare the watershed plans in consultation with municipalities and residents. This is to be accomplished through the establishment of a Watershed Plan Advisory Committee. The counties must also establish a mechanism to periodically review and revise watershed plans so they are current. Plan revisions must be done every five years or sooner, if necessary.

Municipalities have an obligation to implement the criteria and standards developed in each watershed stormwater management plan by amending or adopting laws and regulation for land use and development. The implementation of stormwater management criteria and standards at the local level are necessary, since municipalities are responsible for local land use decisions and planning. The degree of detail in the ordinances depends on the extent of existing and projected development. The watershed stormwater management plan is designed to aid the municipality in setting standards for the land uses it has proposed. Municipalities within rapidly developing watersheds will benefit from the watershed stormwater management plan and will use the information for sound land use considerations. A major goal of the watershed plan and the attendant municipal regulations is to prevent future drainage problems and avoid the aggravation of existing problems.

There are three watersheds in Lawrence County: Slippery Rock Creek / Connoquenessing Creek, Shenango/Mahoning/Beaver River Watersheds and North Fork Little Beaver Creek. Lawrence County and other local municipalities have general (non-Act 167 compliant) stormwater management regulations as part of either the county or local subdivision and land development plan.

Comprehensive Plan

A comprehensive plan is a policy document that states objectives and guides the future growth and physical development of a municipality. The comprehensive plan is a blueprint for housing, transportation, community facilities, utilities and land use. It examines how the past led to the present and charts the community's future path. The Pennsylvania Municipalities Planning Code (MPC Act 247 of 1968, as reauthorized and amended) requires counties to prepare and maintain a county comprehensive plan. In addition, the MPC requires counties to update the comprehensive plan every 10 years.

With regard to hazard mitigation planning, Section 301.a(2) of the Municipality Planning Code requires comprehensive plans to include a plan for land use, which, among other provisions, suggests that the plan give consideration to floodplains and other areas of special hazards and other similar uses. The MPC also requires comprehensive plans to include a plan for community facilities and services and recommends giving consideration to storm drainage and floodplain management.

Lawrence County has a county comprehensive plan that is dated November 2004.

Article III of the Municipality Planning Code (MPC) enables municipalities to prepare a comprehensive plan; however, development of a comprehensive plan is voluntary. A list of those municipalities within Lawrence County that have a comprehensive plan can be found in *Table 56 - Planning Tool Summary* with the remaining municipalities utilizing the county comprehensive plan.

Capital Improvements Plan

The capital improvements plan is a multi-year policy guide that identifies needed capital projects and is used to coordinate the financing and timing of public improvements. Capital improvements relate to streets, stormwater systems, water distribution, sewage treatment and other major public facilities. A capital improvements plan should be prepared by the respective county's planning department and should include a capital budget. This budget identifies the highest priority projects recommended for funding in the next annual budget. The capital improvements plan is dynamic and can be tailored to specific circumstances. There are no municipalities within Lawrence County that have an identified capital improvements plan.

5.2.4. Administrative and Technical Capability

There is one city, ten boroughs and sixteen townships within Lawrence County. Each of these municipalities conducts its daily operations and provides various community services according to local needs and limitations. Some of these municipalities have formed cooperative agreements and work jointly with their neighboring municipalities to provide services such as police protection, fire and emergency response, infrastructure maintenance and water supply management. Others choose to operate on their own. Municipalities vary in staff size, resource availability, fiscal status, service provision, constituent population, overall size and vulnerability to the profiled hazards.

County Planning Department

In Pennsylvania, planning responsibilities traditionally have been delegated to each county and local municipality through the Municipalities Planning Code (MPC). A planning agency acts as an advisor to the governing body on matters of community growth and development. A governing body may appoint individuals to serve as legal or engineering advisors to the planning agency. In addition to the duties and responsibilities authorized by Article II of the MPC, a governing body may, by ordinance, delegate approval authority to a planning agency for subdivision and land development applications. A governing body has considerable flexibility, not only as to which powers and duties are assigned to a planning agency, but also as to what form an agency will possess. A governing body can create a planning commission, a planning department, or both.

Municipal Engineer

A municipal engineer performs duties as directed in the areas of construction, reconstruction, maintenance and repair of streets, roads, pavements, sanitary sewers, bridges, culverts and other engineering work. The municipal engineer prepares plans, specifications and estimates of the work undertaken by the township. All municipalities within Lawrence County have a contracted municipal engineer.

Personnel Skilled in GIS or FEMA HAZUS Software

A geographic information system (GIS) is an integrated, computer-based system designed to capture, store, edit, analyze and display geographic information. Some examples of uses for GIS technology in local government are: land records management, land use planning, infrastructure management and natural resources planning. A GIS automates existing operations such as map production and maintenance, saving a great deal of time and money. The GIS also includes information about map features such as the capacity of a municipal water supply or the acres of public land. GIS is utilized by 911, Planning and Assessment employees in all 3 departments. There is one employee that has completed Basic HAZUS-MH.

Emergency Management Coordinator

Emergency Management is a comprehensive, integrated program of mitigation, preparedness, response and recovery for emergencies/disasters of any kind. No public or private entity is immune to disasters and no single segment of society can meet the complex needs of a major emergency or disaster on its own.

A municipal emergency management coordinator is responsible for emergency management – preparedness, response, recovery and mitigation within his/her respective authority having jurisdiction (AHJ). The responsibilities of the emergency management coordinator are outlined in PA Title 35 §7503:

- Prepare and maintain a current disaster emergency management plan
- Establish, equip and staff an emergency operations center
- Provide individuals and organizational training programs
- Organize and coordinate all locally available manpower, materials, supplies, equipment and services necessary for disaster emergency readiness, response and recovery
- Adopt and implement precautionary measures to mitigate the anticipated effects of a disaster
- Cooperate and coordinate with any public and private agency or entity
- Provide prompt information regarding local disaster emergencies to appropriate Commonwealth and local officials or agencies and the general public
- Participate in all tests, drills and exercises, including remedial drills and exercises, scheduled by the agency or by the federal government

Title 35 requires Lawrence County and its municipalities to have an emergency management coordinator.

5.2.5. Fiscal Capability

Fiscal capability is significant to the implementation of hazard mitigation activities. Every jurisdiction must operate within the constraints of limited financial resources. The following information pertains to various financial assistance programs relevant to hazard mitigation.

State and Federal Grants

During the 1960s and 1970s, state and federal grants-in-aid were available to finance a large number of municipal programs, including streets, water and sewer facilities, airports, parks and playgrounds. During the early 1980s, there was a significant change in federal policy, based on rising deficits and a political philosophy that encouraged states and local governments to raise their own revenues for capital programs. The result has been a growing interest in "creative financing."

Capital Improvement Financing

Because most capital investments involve the outlay of substantial funds, local governments can seldom pay for these facilities through annual appropriations in the annual operating budget. Therefore, numerous techniques have evolved to enable local government to pay for capital improvements over a time period exceeding one year. Public finance literature and state laws governing local government finance classify techniques that are used to finance capital improvements. The techniques include: revenue bonds; lease-purchase, authorities and special district; current revenue (pay-as-you-go); reserve funds; and tax increment financing.

Indebtedness through General Obligation Bonds

Some projects may be financed with general obligation bonds. With this method, the jurisdiction's taxing power is pledged to pay interest and principal to retire debt. General obligation bonds can be sold to finance permanent types of improvements, such as schools, municipal buildings, parks and recreation facilities. Voter approval may be required.

Municipal Authorities

Municipal authorities are most often used when major capital investments are required. In addition to sewage treatment, municipal authorities have been formed for water supply, airports, bus transit systems, swimming pools and other purposes. Joint authorities have the power to receive grants, borrow money and operate revenue generating pro-

grams. Municipal authorities are authorized to sell bonds, acquire property, sign contracts and take similar actions. Authorities are governed by authority board members, who are appointed by the elected officials of the member municipalities.

Sewer Authorities

Sewer authorities include multi-purpose authorities with sewer projects. They sell bonds to finance acquisition of existing systems or for construction, extension, or system improvement. Sewer authority operating revenues originate from user fees. The fee frequently is based on the amount of water consumed and payment is enforced by the ability to terminate service or by the imposition of liens against real estate. In areas with no public water supply, flat rate charges are calculated on average use per dwelling unit.

Water Authorities

Water authorities are multi-purpose authorities with water projects, many of which operate both water and sewer systems. The financing of water systems for lease back to the municipality is among the principal activities of the local government facilities' financing authorities. An operating water authority issues bonds to purchase existing facilities or to construct, extend, or improve a system. The primary source of revenue is user fees based on metered usage. The cost of construction or extending water supply lines can be funded by special assessments against abutting property owners. Tapping fees also help fund water system capital costs. Water utilities are also directly operated by municipal governments and by privately owned public utilities regulated by the PA Public Utility Commission. The PA Department of Environmental Protection has a program to assist with consolidating small water systems to make system upgrades more cost effective.

Circuit Riding Program (Engineer)

The Circuit Riding Program is an example of intergovernmental cooperation. This program offers municipalities the ability to join together to accomplish a common goal. The circuit rider is a municipal engineer who serves several small municipalities simultaneously. These are municipalities that may be too small to hire a professional engineer for their own operations, yet need the skills and expertise the engineer offers. Municipalities can jointly obtain what no one municipality could obtain on its own.

NFPA 1600 – Standard on Disaster/Emergency Management and Business Continuity

NFPA 1600 recommends a responsive financial management and administrative framework that complies with the authority having jurisdiction's (AHJ) program requirements and is uniquely linked to disaster/emergency operations. The framework should provide for maximum flexibility to expeditiously request, receive, manage and apply funds in a non-emergency and emergency environment to ensure the timely delivery of assistance. The program should also be capable of capturing financial data for future costs recovery,

as well as identifying and accessing alternative funding sources and managing budgeted and specially appropriated funds. It is equally important to have procedures in place that will allow an entity to expedite financial decision making and ensure proper accounting occurs.

5.2.6. Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

The capability assessment survey was used to capture information on each jurisdiction's political capability. Survey respondents were asked to identify examples of political capability, such as guiding development away from hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e. building codes, floodplain management ordinances, etc.). These examples were used to guide respondents in scoring their community on a scale of "unwilling" (0) to "very willing" (5) to adopt policies and programs that reduce hazard vulnerabilities. Of the municipalities that responded, none of the municipalities completed this section with a numerical response.

5.2.7. Self-Assessment

In addition to the inventory and analysis of specific local capabilities, the *Capability Assessment Survey* required each local jurisdiction to conduct its own self-assessment of its capability to effectively implement hazard mitigation activities. As part of this process, county and municipal officials were encouraged to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. In response to the survey questionnaire, local officials classified each of the capabilities as either "L= limited" "M= moderate" or "H= high." *Table 58 - Capability Self-Assessment Matrix* summarizes the results of the self-assessment survey. Six (6) municipalities returned this section of the assessment completed.

Table 58 - Capability Self-Assessment Matrix

Lawrence County Capability Self-Assessment Matrix				
Municipality Name	**Capability Category**			
	Planning and Regulatory Capability	**Administrative and Technical Capability**	**Fiscal Capability**	**Community Political Capability**
Ellport Borough	L	L	L	L
Neshannock Township	M	M	L	L
Perry Township	L	L	L	L
Pulaski Township	M	M	L	M
Union Township	H	H	H	H
Wampum Borough	L	L	L	L

5.2.8. Existing Limitations

Funding has been identified as the largest limitation for a municipality to complete mitigation activities. The acquisition of grants is the best way to augment this process for the municipalities. The county and municipalities representatives will need to rely on regional, state and federal partnerships for future financial assistance. Development of intra-county regional partnerships and intra-municipality regional partnerships will bolster this process.

6. Mitigation Strategy

6.1. Update Process Summary

Mitigation goals are general guidelines that explain what the county wants to achieve. Goals are usually expressed as broad policy statements representing desired long-term results. Mitigation objectives describe strategies or implementation steps to attain the identified goals. Objectives are more specific statements than goals; the described steps are usually measurable and can have a defined completion date. There were four goals and thirteen objectives identified in the 2010 hazard mitigation plan. The 2015 Lawrence County Hazard Mitigation Plan Update has four goals and fourteen objectives. Objectives have been added and arranged in order to associate them with the most appropriate goal. These changes are noted in *Table 59 - 2010 Mitigation Goals and* Objectives. A list of these goals and objectives as well as a review summary based on comments received from stakeholders who participated in the HMP update process is included in *Table 59 - 2010 Mitigation Goals and Objectives.* These reviews are based on the 5-Year hazard mitigation plan review worksheet, which includes a survey on existing goals and objectives, completed by the local planning team. Municipal officials then provided feedback on the changes to the goals and objectives via a mitigation strategy update meeting. Copies of these meetings and all documentation associated with the meetings are located in Appendix C.

Actions provide more detailed descriptions of specific work tasks to help the county and its municipalities achieve prescribed goals and objectives. There were fifty one actions identified in the 2010 mitigation strategy. A review of the 2010 mitigation actions was completed by the local planning team. A list of these actions as well as a review and summary of their progress based on comments from the Lawrence County Local Planning Team is included in

Table 60 - 2010 Mitigation Actions Review. Actions were evaluated by the local planning team with the intent of carrying over any actions that were not started or continuous for the next five years.

Table 59 - 2010 Mitigation Goals and Objectives

Lawrence County 2010 Mitigation Goals and Objectives Review Worksheet		
GOAL 1	*Direct county and local governments to help protect life and property from natural and manmade disasters.*	Goal 1 was reviewed by the local planning team. The team determined that the goal is still valid and will remain in the 2015 plan update.
Objective 1.1	Improving enforcement of floodplain regulations within the County	Objective 1.1 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 1.2	The County and its municipalities will continue sewer and storm drain management.	Objective 1.2 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 1.3	The County and its municipalities will prepare for post disaster events	Objective 1.3 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 1.4	Continue to support Region 13 efforts for a Fusion Center for threat intelligence and law enforcement.	Objective 1.4 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
New Objective 1.5	County will work with municipalities and municipality first responders to encourage regionalization to provide better public safety services.	The local planning team developed this new objective.
GOAL 2	*To take measures that will reduce damage in specific hazard prone areas.*	Goal 2 was reviewed by the local planning team. The team determined that the goal should be amended to read as follows, Take measures that will reduce vulnerability to hazards identified in this hazard mitigation plan.
Objective 2.1	Inform public to elevate and protect all systems vital to their operation.	Objective 2.1 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 2.2	Develop warning devices to notify public in a hazard emergency	Objective 2.2 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.

Lawrence County 2010 Mitigation Goals and Objectives Review Worksheet		
Objective 2.3	Assist public and private utility providers to maintain aging infrastructure.	Objective 2.3 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 2.4	Acquisition/relocation of property in the floodplain.	Objective 2.4 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan.
Objective 2.5	If acquisition/relocation proves to be too costly, modification of property in the floodplain, such as a flood wall would be an acceptable alternative. It does not, however, remove structures from the floodplain, therefore these structures could still be at risk.	Objective 2.5 was reviewed and the local planning team. The team feels that this objective does not align with the 2015 strategy and will be removed.
Objective 2.6	Stream bank/bed management and restoration throughout the County is another mitigation strategy needed to help protect residents and their property from flood damage. Stream bank/bed restoration is a Best Management Practice (BMP) that will help reduce flooding in certain areas of the County.	Objective 2.6 was reviewed and the local planning team. The objective will be renumbered to Objective 2.5 and will read as follows, Stream bank/bed management and restoration will be implemented to reduce flooding in certain areas of the county.
Objective 2.7	Assist local Fire Departments in reducing the impacts to the public after a hazard event has occurred. Coordinate with partners to restore to pre-event condition or better.	Objective 2.7 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan and be numbered 2.6. Reword to public safety agencies
Objective 2.8	Mitigate future damage to roads, drainage and utilities by requiring that reconstruction to be built to include sustainable standards.	Objective 2.8 was reviewed and the local planning team determined that no changes were necessary and the objective will remain in the 2015 hazard mitigation plan and will be numbered 2.7.
GOAL 3	*To improve tracking of hazards and mitigation actions.*	Goal 3 was reviewed by the local planning team. The team determined that the goal does not require changes and remains valid in the 2015 plan.
Objective 3.1	Use GIS and existing technologies to cost effectively track mitigation projects.	Objective 3.1 was reviewed by the local planning team. The team determined that no progress had been made with this objective. The objective will remain valid for the 2015 plan.
Objective 3.2	Expand GIS network to synchronize with state and federal hazard warning systems (eg. Flood Warning).	

Lawrence County 2010 Mitigation Goals and Objectives Review Worksheet		
GOAL 4	*Generate more public involvement in the hazard mitigation plan update.*	Goal 4 was reviewed by the local planning team. The goal has been updated to read, "Generate more public involvement in the hazard mitigation plan maintenance and update process.
Objective 4.1	Providing information to residents on the National Flood Insurance Program (NFIP), providing access to the Pennsylvania Emergency Preparedness Guide, the Local Emergency Preparedness Guide of Lawrence County, and a flood proofing workshop or all residents and business owners. Update County Website to include Plan details and updates.	Objective 4.1 was reviewed by the local planning team. The team decided to break the goal up by developing specific objectives for the overall objective 4.1 from the 2010 plan. Objective 4.1 will read, Educate the residents on the National Flood Insurance Program. Objective 4.2 will read, Provide access to emergency preparedness guides. Objective 4.3 will read, Conduct workshops and seminars for all high hazards.

Table 60 - 2010 Mitigation Actions Review

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
1.1.1 Lawrence County and the municipalities will keep development away from vacant parcels in the floodplain			X			The County continues to work with the municipalities to complete this task. The County will encourage municipalities to keep development away from vacant parcels in the floodplain.
1.1.2 Amend municipal floodplain ordinances to require new construction to be at least two-feet above the floodplain, which is compliant with NFIP regulations				X		Completed in 2012 by all municipalities.

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
1.1.3 Lawrence County to arrange with PEMA/FEMA/DCED to hold training sessions with County and Municipalities and local engineering firms on the NFIP requirements			X			Completed a municipal training session that included topics on the SALDO, Floodplain and Zoning in October of 2014. This action will be renumbered to 1.1.2
1.2.1 Encourage maintenance and separation of sewer systems and storm water systems to alleviate flooding in the county			X			The local planning team determined that this action occurs annually by numerous municipalities as funding is available.
1.3.1 Designated Coordination Centers will be created in each township and borough, and be supplied with Generators, Water, Food, & Supplies for post disaster recovery efforts.			X			The county continues to work on this. North Beaver Township, Neshannock Township and Shenango have completed these.
1.3.2 Municipalities will develop evacuation plans for municipal buildings and sporting events.		X				Some municipalities have completed these forms. County would like to have these submitted to their office.
1.3.3 The county will continue to develop and maintain the Pandemic Emergency Plan for all municipalities			X			County EMA continues to complete this item with some progress noted.
1.3.4 Lawrence County will collect and analyze dam inundation maps to determine which communities are at risk of a dam failure.			X			Maps are not available digitally and the county continues to work towards this.
1.4.1 Lawrence County to determine Agencies involved, databases needed, and investigate resources for a Fusion Center (Currently in Process through Region 13)			X			Region 13 is currently negotiating with the FBI to collocate the center.
1.5.1 Develop a strategy to complete regionalization of emergency management services.						New Action

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
1.5.2 Develop a strategy to complete regionalization of fire services						New Action
1.5.3 Develop a strategy to complete regionalization of law enforcement						New Action
1.5.4 Develop a strategy to complete regionalization of emergency medical services						New Action
1.5.5 Develop Training opportunities for first responders for all hazards.						New Action
2.1.1 Use GIS to develop addresses for structures in flood plains and send educational brochures to affected structures.	X					The addresses are available but the local planning team plans to accomplish this 2015-2020
2.2.1 Acquire Funding for Public Warning System & Sirens for all critical facilities, municipalities, and educate households within the County.		X				Education classes with municipalities completed on sirens. Website updated for public warning. Converted some sirens to just emergency use.
2.2.2 Install early warning Flood gages upstream to notify emergency services.		X				Grant funding is needed. Greenways Plan will outline the installation of new river gauges for recreation uses.
2.3.1 Create a council with local utility providers and county planners to locate aging infrastructure of utilities		X				County EMA has regular coordination with these agencies.
2.3.2 Replace/Rehab aging sewer lines or install lines where non exist at • Carlisle Avenue; Court and Countyline Streets; Highland and Hazelcroft Avenues, Lutton Street; Mahoning Avenue, • Moravia Street; Scott Street; and Wilmington Avenue.			X			Remove the 2 bullets. • Carlisle Avenue; Court and Countyline Streets; Highland and Hazelcroft Avenues, Lutton Street; Mahoning Avenue, • Moravia Street; Scott Street; and Wilmington Avenue.

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
2.3.3 Replace aging Water lines			X			The local planning team stated this is continuous.
2.3.4 Repair of sliding hillside that is collapsing utility lines and eroding onto local streets						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.3.5 Installation of a new pump station to pump water to the river						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.3.6 Installation of inlets and new discharge pipes to river at East Washington Street and Croton Avenue; Mill Street						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.3.7 Cut trees away from Power lines			X			This action is still valid with minimal progress since the last mitigation plan. This action will be renumbered to 2.3.4
2.3.8 Develop a database in existing GIS system of all utility networks, noting age and condition of infrastructure.			X			Some information has been added as provided, but providers are reluctant to provide the data. Renumber to action 2.3.5
2.4.1 Acquisition / relocation of properties in the Cottage Grove area of Wilmington Township, and Kerr and Mooney Trailer Parks.						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form This action will be changed to read as follows: Acquisition or relocation of properties located in flood prone areas
2.4.2 Construct flood walls in the Kerr and Mooney Mobile Home Parks to reduce flood damages						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.1 Dredging the stream at Covert's Crossing Road and Bridge in Union and Mahoning Townships to control flooding downstream.						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form. This action should be reworded to read, Reduce sediment load in waterways to decrease risk of flooding.
2.5.2 Alleviate flood problems on the Neshannock Creek at the Cottage Grove						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
area in Wilmington Township, the Big Run Area in Shenango Township, and the Hillsville area in Mahoning Township.						
2.5.3 Construct new Salt Shed to prepare for winter weather						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.4 Mitigate flooding on Daugherty Road in Shenango Township						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.5 Promote Residential Sprinkler Systems to reduce fire damages			X			Some progress has been made with this action. The action should remain in the updated plan for further coordination
2.5.6 Develop appropriate flood protection for New Castle School of Trade in Union Township, which is located in the Flood plain						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.7 Dredge the Big and Little Neshannock Creeks						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.8 Dredge Deer Creek in Pulaski Township						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.9 Elevate Nashua Road						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form This action should be reworded to state, Elevate roads to alleviate flooding to roadways that prohibits evacuation and public safety access
2.5.10 Develop appropriate flood protection for Sewage Treatment Facility in New Wilmington Borough						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form This action should be reworded to state, Develop appropriate flood protection for sewage and water treatment facilities.

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
2.5.11 Remove 90 degree bend in the North Fork of the Little Beaver River, below Scott Wallace Road						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.12 Replace Church Street Bridge Culvert with larger diameter culvert to increase flow						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
2.5.13 Stormwater mitigation is needed for all municipalities			X			All municipalities have Storm Water management ordinances.
2.6.1 Steam Bank/Bed restoration should be conducted in Hickory Township, Shenango Township, Little Beaver Township, and the City of New Castle						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form. This action should be reworded to say, Conduct stream bank and stream bed restoration to decrease flooding. Renumber to action 2.5.2
2.6.2 Watershed Assessment			X			The action needs reworded to read, Implement watershed conservation plan. Watershed plans have been completed on all the major watersheds of the county. Renumber to action 2.5.3
2.6.3 Stream Bank Management is needed at the Lakewood Beach Area at Hottenbaugh Run in Hickory Township						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form
Increase the access points to various bodies of water to increase emergency services response and recovery capabilities						New Action Fire, Drowning, disorientation, environmental hazards
2.7.1 Maintain and repair fire hydrants in local municipalities			X			Install, maintain and repair. Renumber to 2.6.2
Improve the emergency comms systems can with stand all hazards identified in the mitigation plan			X			New Action: County constructing a new radio systems and communication center/EOC based on the 2010 hazard mitigation plan
Increase emergency planning capabilities as it pertains to missing persons and						New Action

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
search and rescue in recreation areas.						
2.8.1 Municipal offices to review statewide Uniform Construction Code to ensure enforcement.			X			Reword: Encourage adoption and enforcement of the UCC. Renumber
2.8.2 Continue roadside Storm Water Drainage upgrades						This is a structural project and is outlined in the 2010 municipal mitigation opportunity review form. Renumber to 2.7.2
3.1.1 Develop a database in existing GIS system of all natural resource areas including maps to be used in future mitigation activities.			X			National heritage inventory and Greenways Plan Completed or in progress.
3.1.2 Collect more information on critical facilities so that future mitigation plan updates can distinguish vulnerability on building characteristics.			X			The county continues to complete this.
3.2.1 Expand GIS network to synchronize with state and federal hazard notification systems (eg. Flood Warning).						New Action
3.2.2 Improve municipal project status updating process						New Action
4.1.1 Provide the local Public Libraries and public websites with all available resources, as well as a number of FEMA publications, and a final copy of the Lawrence County Hazard Mitigation Plan. This will make all available informational resources readily accessible to the public for their convenience.			X			Completed with the 2010 plan and will be completed with the 2015 plan. Renumber to action 4.2.1

2010 Lawrence County Mitigation Actions Review						
Existing Mitigation Actions	**Status**					**Review Comments**
	No Progress / Unknown	**In Progress / Not Yet Complete**	**Continuous**	**Completed**	**Discontinued**	
4.1.2 Create a "How To" Mitigation brochures for use at public events that would include information and pictures like that contained in FEMA's publications: Retrofitting for Homeowners Guide, Elevating Your Flood Prone Home, Elevating Residential Structures, and Information on NFIP	X					Need grant funding to complete. Renumber to action 4.1.1
4.1.3 Create displays for children's programs that teach safety. Examples of information used would be similar to that on the FEMA for Kids CD or for Sparky Fire Safety Program.			X			County EMA and local municipalities conduct annual outreach projects annually. Renumber to action 4.2.2
4.1.4 County and PEMA to conduct outreach efforts to educate municipalities about NFIP and its requirements			X			Educational series. Same as 1.3.1 and should be removed. Reword 1.1.3 to look more like this action
4.1.5 Provide Flood Insurance Rate Map (FIRM) information to people who inquire, and publicize this service			X			2 certified flood plain managers on staff at the county planning office. Do provide maps and assistance as necessary. Renumber to action 4.1.2
4.1.6 Target owners of properties within identified hazards areas for additional outreach regarding mitigation and disaster preparedness			X			County EMA completes outreach projects annually. Renumber to action 4.3.1
Conduct outreach and educational programs to increase vigilance and potential impacts -on invasive species of Lawrence County						New Action

6.2. Mitigation Goals and Objectives

Based on results of the goals and objectives evaluation exercise and input from the local planning team, a list of six goals and twenty four corresponding objectives was developed. *Table 61 - 2015 Goals and Objectives* details the mitigation goals and objectives established for the 2015 Lawrence County Hazard Mitigation Plan Update.

Table 61 - 2015 Goals and Objectives

Lawrence County 2015 Goals and Objectives	
GOAL 1	Direct county and local governments to help protect life and property from natural and manmade disasters.
Objective 1.1	Improving enforcement of floodplain regulations within the county
Objective 1.2	The county and its municipalities will continue sewer and storm drain management
Objective 1.3	The county and its municipalities will prepare for post disaster events
Objective 1.4	Continue to support Region 13 efforts for a fusion center for threat intelligence and law enforcement
Objective 1.5	County will work with municipalities and municipality first responders to encourage regionalization to provide better public safety services
GOAL 2	Take measures that will reduce vulnerability to hazards identified in this hazard mitigation plan
Objective 2.1	Inform public to elevate and protect all systems vital to their operation
Objective 2.2	Develop warning devices to notify public in a hazard emergency
Objective 2.3	Work with public and private utility providers to maintain aging infrastructure
Objective 2.4	Acquisition/relocation of property in the floodplain.
Objective 2.5	Stream bank/bed management and restoration will be implemented to reduce flooding in certain areas of the county
Objective 2.6	Assist public safety agencies in reducing the impacts to the public after a hazard event has occurred
Objective 2.7	Mitigate damage to roads, drainage and utilities by requiring that reconstruction be built to standard.
GOAL 3	*To improve tracking of hazards and mitigation actions.*
Objective 3.1	Use GIS and existing technologies to cost effectively track mitigation projects.
GOAL 4	*Generate more public involvement in the hazard mitigation plan maintenance and update process*
Objective 4.1	Educate the residents on the National Flood Insurance Program
Objective 4.2	Provide access to emergency preparedness guides
Objective 4.3	Conduct workshops and seminars for all high hazards

6.3. Identification and Analysis of Mitigation Techniques

This section includes an overview of alternative mitigation actions based on the goals and objectives identified in Section 6.2. There are four general mitigation strategy techniques to reducing hazard risks:

- Local plans and regulations
- Structure and infrastructure
- Natural systems protection
- Education and awareness

Local Plans and Regulations: These actions include government authorities, policies or codes that influence the way land and buildings are developed and built. The following are some examples:

- Comprehensive plans
- Land use ordinances
- Subdivision regulations
- Development review
- Building codes and enforcement
- National Flood Insurance Program and Community Rating System
- Capital improvement programs
- Open space preservation
- Stormwater management regulations and master plans

The local plans and regulations technique will protect and reduce the impact of specific hazards on new and existing buildings by improving building code standards and regulating new and renovation construction. The improved building codes will decrease the impact of risk hazards. Subdivision and land development enhancements will also augment this process. Ensuring that municipalities participate in the National Flood Insurance Program and encourage participation in the Community Rating System will decrease the impact as well.

Structure and infrastructure implementation: These actions involve modifying existing structures and infrastructure or constructing new structures to reduce hazard vulnerability. The following are examples:

- Acquisitions and elevations of structures in flood prone areas
- Utility undergrounding
- Structural retrofits
- Floodwalls and retaining walls
- Detention and retention structures
- Culverts
- Safe rooms

Structure and infrastructure implementation is a technique that removes or diverts the hazard from structures or protects the structure from a specific hazard. The new or renovated structures are therefore protected or have a reduced impact of hazards.

Natural Resource Protection: These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. They include the following:

- Erosion and sediment control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

Natural resource protection techniques allow for the natural resource to be used to protect or lessen the impact on new or renovated structures through the management of these resources. Utilization and implementation of the examples above will protect new and existing buildings and infrastructure.

Education and Awareness: These are actions to inform and educate citizens, elected officials and property owners about hazards and potential ways to mitigate them and may also include participation in national programs. Examples of these techniques include the following:

- Radio and television spots
- Websites with maps and information
- Real estate disclosure
- Provide information and training
- NFIP outreach
- StormReady
- Firewise Communities

The education and awareness technique will protect and reduce the impact of specific hazards on new and existing buildings through education of citizens and property owners on the impacts that specific hazards could have on new or renovated structures. This information will allow the owner to make appropriate changes or enhancements that will lessen or eliminate the impact of hazards.

Table *62 - Mitigation Strategy Technique Matrix* provides a matrix identifying the mitigation techniques used for all low, moderate and high risk hazards in the county. The specific actions associated with these techniques are included in *Table 63 - 2015 Mitigation Action Plan*.

Table 62 - Mitigation Strategy Technique Matrix

Lawrence County Mitigation Strategy Technique Matrix				
HAZARD	**MITIGATION TECHNIQUE**			
	Local Plans and Regulations	**Structural and Infrastructure**	**Natural Systems Protection**	**Education and Awareness**
Drought	X			X
Earthquake	X			X
Extreme Temperatures	X			X
Flood, Flash Flood, Ice Jam Flooding	X	X	X	X
Invasive Species	X		X	X
Lightning Strike				X
Pandemic and Infectious Disease	X			X
Radon Exposure	X			X
Tornados and Wind Storms	X	X		X

HAZARD	MITIGATION TECHNIQUE			
	Local Plans and Regulations	Structural and Infra-structure	Natural Systems Protection	Education and Awareness
Wildfire	X	X	X	X
Winter Storms	X	X		X
Civil Disturbance	X			X
Disorientation	X			X
Drowning	X	X		X
Environmental hazards	X	X		X
Nuclear Incidents	X	X		X
Terrorism	X	X		X
Transportation Accidents	X	X		X
Urban Fire and Explo-sions	X			X
Utility Interruptions	X	X		X
Dam Failure	X			X
Hurricane/Tropical Storm	X			X
Landslides	X	X		X

6.4. Mitigation Action Plan

The Lawrence County Hazard Mitigation Local Planning Team (LPT) immediately began work on the mitigation strategy section of the 2015 hazard mitigation plan (HMP) update after the risk assessment section was completed. The LPT started this section by reviewing the 2010 HMP mitigation strategy section. A review of the previous goals, objectives, actions and project opportunities documented in the 2010 HMP was conducted. The next step the LPT completed was the brainstorming of possible new actions based on new identified risks. The LPT compiled all this information for presentations to the municipalities.

The LPT identified the following accomplishments since the development of the 2010 Lawrence County Hazard Mitigation Plan:

- The Lawrence County Department of Planning completed storm water management plans for all watersheds in Lawrence County. Municipalities adopted the plans after the 2010 Lawrence County Hazard Mitigation Plan was developed through 2011.
- The Lawrence County Department of Public Safety completed a children in disasters plan and finalized this document in June 2015.
- The Lawrence County Department of Planning has employed 2 floodplain managers in the department. These managers can assist municipalities.
- The Lawrence County Local Emergency Planning Committee completed a commodity flow study update in August 2013.
- The Lawrence County Department of Planning and Department of Public Safety completed a floodplain and SALDO workshop in October 2014.

- The Lawrence County Comprehensive Plan is currently being updated and is anticipated to be completed in 2016.
- The Lawrence County Greenways Plan is currently under development and is anticipated to be completed in 2016.

The Lawrence County Department of Public Safety has been conducting numerous infrastructure enhancement projects over the past 5 years. Administrative staff has been committed to these infrastructure projects. With this commitment by the Lawrence County DPS Staff, there have been challenges with the completion of actions or projects outlined in the 2010 hazard mitigation plan. The Lawrence County Department of Public Safety is committed to making progress during the 2015-2020 planning period. During this period, annual reviews will be completed and reports of all actions and projects will be developed to determine the status.

MCM Consulting Group, Inc. completed municipality meetings at various time periods at the Lawrence County Department of Public Safety. During all these meetings, an overview of mitigation strategy was presented and the municipalities were informed that they needed to have at least one hazard-related mitigation action for their municipality. All municipalities were invited to attend these meetings.

The municipalities were notified of draft mitigation actions and encouraged to provide new mitigation actions that could be incorporated into the plan. Municipalities were provided copies of their previously submitted mitigation opportunity forms and asked to determine if the projects were still valid. Municipalities were solicited for new project opportunities as well. All agendas, sign in sheets and other support information from these meetings is included in Appendix C.

Mitigation measures for the 2015 Lawrence County HMP are listed in the mitigation action plan. *Table 63 - 2015 Mitigation Action Plan* is the 2015 Lawrence County Mitigation Action Plan. This plan outlines mitigation actions and projects that comprise a strategy for Lawrence County. The action plan includes actions, a benefit and cost prioritization, a schedule for implementation, any funding sources to complete the action, a responsible agency or department and an estimated cost. All benefit and cost analysis was completed using the Pennsylvania Emergency Management Agency recommended PASTEEL analysis tool. The completed PASTEEL analysis is located in Appendix I. *Table 64 - Municipal Hazard Mitigation Actions Checklist* is a matrix that identifies the county and/or municipalities responsible for mitigation actions in the new mitigation action plan.

Table 63 - 2015 Mitigation Action Plan

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
1.1.1	Local Plans and Regulations NFIP	Lawrence County and the municipalities will keep development away from vacant parcels in the floodplain	Flooding	**X**			Continuous	Staff Time	Lawrence County Planning Department	$1,000
1.1.2	Education and Awareness NFIP	Lawrence County to arrange with PEMA/FEMA/DCED to hold training sessions with County and Municipalities on the NFIP requirements	Flooding	**X**			Annually	Staff Time	Lawrence County EMA	$10,000
1.2.1	Structure and Infrastructure Implementation	Clear and separate sewer systems and storm drains to alleviate flooding in the county	Flooding		**X**		Continuous	Sewer Fees	Municipal Public Works	$10,000
1.3.1	Local Plans and Regulations	Designated Coordination Centers will be created in each township and borough, and be supplied with Generators, Water, Food, & Supplies for post disaster recovery efforts.	All Hazards	**X**			2015-2020	Staff Time	Municipal Planning Commission	$10,000
1.3.2	Local Plans and Regulations	Municipalities will develop evacuation plans for municipal buildings and sporting events.	All Hazards		**X**		2015-2020	Staff Time	Municipal Planning Commission and Officials	$20,000
1.3.3	Local Plans and Regulations	The county will continue to develop and maintain the Pandemic Emergency Plan for all municipalities	Pandemic and Infectious Disease		**X**		2015-2020	Staff Time	Lawrence County Department of Public Safety	$20,000
1.3.4	Local Plans and Regulations	Lawrence County will collect and analyze dam inundation maps to determine which communities are at risk of a dam failure	Dam Failure		**X**		2015	EMPG	Lawrence County Department of Public Safety	$10,000
1.3.5	Local Plans and Regulations	Lawrence County will recommend ways to integrate the hazard mitigation plan with other municipal plans	All Hazards	**X**			2016-2020	Staff Time	Lawrence County Department of Planning	$5,000

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
1.4.1	Local Plans and Regulations	Lawrence County to determine Agencies involved, databases needed, and investigate resources for a Fusion Center (Currently in Process through Region 13)	All Hazards		**X**		Continuous	EMPG	Lawrence County Department of Public Safety	$50,000
1.5.1	Local Plans and Regulations	Develop a strategy to complete regionalization of emergency management services	All Hazards		**X**		2015-2017	Staff Time	Municipalities and Lawrence County Department of Public Safety	$25,000
1.5.2	Local Plans and Regulations	Develop a strategy to complete regionalization of fire services	All Hazards		**X**		2015-2017	Staff Time	Municipalities and Lawrence County Department of Public Safety	$25,000
1.5.3	Local Plans and Regulations	Develop a strategy to complete regionalization of law enforcement	All Hazards	**X**			2015-2017	Staff Time	Municipalities and Lawrence County Department of Public Safety	$25,000
1.5.4	Local Plans and Regulations	Develop a strategy to complete regionalization of emergency medical services	All Hazards		**X**		2015-2017	Staff Time	Municipalities and Lawrence County Department of Public Safety	$25,000
2.1.1	Education and Awareness NFIP	Use GIS to develop addresses for structures in flood plains and send educational brochures	Flooding		**X**		2015-2020	FMA or PDM	Lawrence County Department of Public Safety	$20,000
2.2.1	Structure and Infrastructure Implementation	Acquire Funding for Public Warning System & Sirens for all critical facilities, municipalities, and educate households within the County	All Hazards		**X**		2015-2020	FMA or PDM	Lawrence County Department of Public Safety	$200,000
2.2.2	Structure and Infrastructure Implementation	Install early warning flood gages upstream to notify emergency services	All Hazards		**X**		2015-2020	FMA	Lawrence County Department of Planning	$600,000
2.3.1	Local Plans and Regulations	Create a council with local utility providers and county planners to locate aging infrastructure of utilities	Utility Interruptions, Flood, Fire, Winter Storms, Tornados, Windstorms		**X**		2015-2016	EMPG and Staff Time	Lawrence County Department of Public Safety	$10,000

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
2.3.2	Structure and Infrastructure Implementation	Replace/Rehab aging sewer lines or install lines where none exist	Flooding/Flash Flooding			X	2015-2020	FMA, PDM or Sewer Fees	Municipalities	Varies
2.3.3	Structure and Infrastructure Implementation	Replace aging Water lines	Utility Interruptions Drought			X	Continuous	Water Fees and CDBG	Municipalities	Varies
2.3.4	Structure and Infrastructure Implementation	Cut trees away from Power lines	Utility Interruptions, Flood, Fire, Winter Storms, Tornados, Windstorms		X		Continuous	PDM	Municipalities	Varies
2.3.5	Local Plans and Regulations	Develop a database in existing GIS system of all utility networks, noting age and condition of infrastructure.	All Hazards		X		Continuous	Staff Time	Lawrence County Department of Planning and Public Safety	$25,000
2.4.1	Structure and Infrastructure Implementation NFIP	Acquisition or relocation of properties located in flood prone areas	Flooding		X		2015-2020	HMGP and FMA	Lawrence County Department of Public Safety	Varies
2.4.2	Structure and Infrastructure Implementation	Construct flood walls to decrease the risk to flooding	Flooding		X		2015-2020	FMA, PDM, HMGP	Municipalities	Varies
2.5.1	Natural Resource Protection	Dredge waterways to decrease flooding	Flooding			X	2015-2020	PDM, FMA, HMGP	Municipalities	Varies
2.5.2	Natural Resource Protection	Conduct stream bank and stream bed restoration to decrease flooding	Flooding			X	2015-2020	PDM, FMA, HMGP	Municipalities and PA Conservation District	Varies
2.5.3	Natural Resource Protection	Complete and maintain watershed conservation plans	Flooding			X	2015-2020	PDM, FMA, HMGP	Lawrence County Department of Planning	$50,000
2.6.1	Structure and Infrastructure Implementation	Increase the access points to various bodies of water to increase emergency services response and recovery capabilities	Urban Fire and Explosions, Drowning, Disorientation, Environmental Hazards		X		2015-2020	CDBG	Municipalities	$50,000

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
2.6.2	Structure and Infrastructure Implementation	Install, maintain and repair fire hydrants in local municipalities	Urban Fire and Explosions			**X**	2015-2020	Water Fees	Municipalities and Municipal Water Authorities	Varies
2.6.3	Local Plans and Regulations	Improve the emergency communication systems so they can withstand all hazards identified in the mitigation plan	All Hazards		**X**		2015-2016		Lawrence County Department of Public Safety	$5,000,000
2.6.4	Local Plans and Regulations	Increase emergency planning capabilities as it pertains to missing persons and search and rescue in recreation areas	Disorientation, Drowning	**X**			Continuous	EMPG	Lawrence County Department of Public Safety and Municipalities	$10,000
2.7.1	Local Plans and Regulations	Encourage adoption and enforcement of the Uniform Construction Code.	All Hazards			**X**	Continuous	Staff Hours	Lawrence County Department of Planning	$5,000
2.7.2	Structure and Infrastructure Implementation	Continue roadside storm water drainage upgrades	Flooding			**X**	Continuous	FMA, HMGP and CDBG	Municipalities	Varies
3.1.1	Local Plans and Regulations	Develop a database in existing GIS system of all natural resource areas including maps to be used in future mitigation activities	All Hazards		**X**		Continuous	Staff Time and EMPG	Lawrence County Department of Planning and Public Safety	$100,000
3.1.2	Local Plans and Regulations	Collect more information on critical facilities so that future mitigation plan updates can distinguish vulnerability on building characteristics	All Hazards		**X**		Continuous	Staff Time and EMPG	Lawrence County Department of Planning and Public Safety	$50,000
3.1.3	Local Plans and Regulations	Improve municipal project status updating process	All Hazards	**X**			2015-2016	EMPG	Lawrence County Department of Public Safety	$5,000

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
4.1.1	Education and Awareness NFIP	Create a "How To" Mitigation brochure for use at public events that would include information and pictures like that contained in FEMA's publications: Retrofitting for Homeowners Guide, Elevating Your Flood Prone Home, Elevating Residential Structures, and Information on NFIP	Flooding		**X**			PDM, EMPG and Staff Time	Lawrence County Department of Planning and Public Safety	$10,000
4.1.2	Education and Awareness NFIP	Provide Flood Insurance Rate Map (FIRM) information to people who inquire, and publicize this service	Flooding		**X**		2015-2020	PDM, FMA, EMPG	Lawrence County Department of Planning and Public Safety	$10,000
4.2.1	Education and Awareness	Provide the local Public Libraries and public websites with all available resources, as well as a number of FEMA publications, and a final copy of the Lawrence County Hazard Mitigation Plan to make all available informational resources readily accessible to the public	All Hazards	**X**			2015-2020	PDM, FMA, EMPG	Lawrence County Department of Planning and Public Safety	$5,000
4.2.2	Education and Awareness	Create displays for children's programs that teach safety. Examples of information used would be similar to that on the FEMA for Kids CD or for Sparky Fire Safety Program	All Hazards		**X**		2015-2020	PDM, FMA, EMPG	Lawrence County Department of Planning and Public Safety	$5,000
4.2.3	Education and Awareness	Develop and disseminate emergency guides on sheltering in place procedures	Environmental Hazards	**X**			2015-2020	EMPG	Lawrence County Department of Planning and Public Safety	$5,000
4.3.1	Education and Awareness	Target owners of properties within identified hazards areas for additional outreach regarding mitigation and disaster preparedness	All Hazards		**X**		2015-2020	EMPG	Lawrence County Department of Planning and Public Safety	$5,000

Lawrence County 2015 Mitigation Action Plan										
Action Number	Mitigation Actions			Benefit/Cost Prioritization			Implementation			Estimated Cost
	Category	Description/ Action Items	Hazard Vulnerability	High	Medium	Low	Schedule	Funding	Responsibility	
4.3.2	Education and Awareness	Conduct outreach and educational programs to increase vigilance and potential impacts on invasive species of Lawrence County	Invasive Species	**X**			2015-2020	EMPG	Lawrence County Department of Planning and Public Safety	$15,000
4.3.3	Education and Awareness	Conduct a workshop to educate municipalities and residents on mitigation projects to reduce the impact of radon	Radon	**X**			2015-2020	EMPG	Lawrence County Department of Planning and Public Safety	$5,000

Funding acronym definitions:
FMA: Flood Mitigation Assistance Grant Program, administered by the Federal Emergency Management Agency
HMGP: Hazard Mitigation Grant Program, administered by the Federal Emergency Management Agency
PDM: Pre-Disaster Mitigation Grant, administered by the Federal Emergency Management Agency
EMPG: Emergency Management Performance Grant, administered by the Federal Emergency Management Agency
HSGP: Homeland Security Grant Program, administered by the Federal Emergency Management Agency
HMEP: Hazardous Material Emergency Planning Grant, administered by the Pennsylvania Emergency Management Agency
HMRF: Hazardous Material Response Fund, administered by the Pennsylvania Emergency Management Agency

Table 64 - Municipal Hazard Mitigation Actions Checklist

Municipality	1.1.1	1.1.2	1.2.1	1.3.1	1.3.2	1.3.3	1.3.4	1.4.1	1.5.1	1.5.2
City of New Castle	**X**	**X**	**X**	**X**	**X**				**X**	**X**
Bessemer Borough	**X**	**X**	**X**	**X**	**X**				**X**	**X**
Ellport Borough	**X**	**X**	**X**	**X**	**X**				**X**	**X**
Ellwood City Borough	**X**	**X**	**X**	**X**	**X**				**X**	**X**

Municipality	1.1.1	1.1.2	1.2.1	1.3.1	1.3.2	1.3.3	1.3.4	1.4.1	1.5.1	1.5.2
Enon Valley Borough	x	x		x	x				x	x
Hickory Township	x	x		x	x				x	x
Little Beaver Township	x	x		x	x				x	x
Mahoning Township	x	x		x	x				x	x
Neshannock Township	x	x		x	x				x	x
New Beaver Borough	x	x		x	x				x	x
New Wilmington Borough	x	x		x	x				x	x
North Beaver Township	x	x		x	x				x	x
Perry Township	x	x		x	x				x	x
Plain Grove Township	x	x		x	x				x	x
Pulaski Township	x	x		x	x				x	x
S.N.P.J. Borough	x	x		x	x				x	x
Scott Township	x	x		x	x				x	x
Shenango Township	x	x		x	x				x	x
Slippery Rock Township	x	x		x	x				x	x
South New Castle Borough	x	x		x	x				x	x
Taylor Township	x	x		x	x				x	x
Union Township	x	x		x	x				x	x
Volant Borough	x	x		x	x				x	x
Wampum Borough	x	x	x	x	x				x	x
Washington Township	x	x		x	x				x	x
Wayne Township	x	x		x	x				x	x
Wilmington Township	x	x	x	x	x				x	x
Lawrence County	x	x	x	x	x	x	x	x	x	x

Municipality	1.5.3	1.5.4	2.1.1	2.2.1	2.2.2	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5
City of New Castle	x	x	x	x		x	x	x	x	x
Bessemer Borough	x	x	x	x		x	x	x	x	
Ellport Borough	x	x	x	x		x	x	x	x	
Ellwood City Borough	x	x	x	x		x	x	x	x	
Enon Valley Borough	x	x	x	x		x	x	x	x	
Hickory Township	x	x	x	x		x	x	x	x	
Little Beaver Township	x	x	x	x		x	x	x	x	
Mahoning Township	x	x	x	x		x	x	x	x	
Neshannock Township	x	x	x	x		x	x	x	x	
New Beaver Borough	x	x	x	x		x	x	x	x	
New Wilmington Borough	x	x	x	x		x	x	x	x	
North Beaver Township	x	x	x	x		x	x	x	x	
Perry Township	x	x	x	x		x	x	x	x	

Municipality	1.5.3	1.5.4	2.1.1	2.2.1	2.2.2	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5
Plain Grove Township	x	x	x	x		x	x	x	x	
Pulaski Township	x	x	x	x		x	x	x	x	
S.N.P.J. Borough	x	x	x	x		x	x	x	x	
Scott Township	x	x	x	x		x	x	x	x	
Shenango Township	x	x	x	x		x	x	x	x	
Slippery Rock Township	x	x	x	x		x	x	x	x	
South New Castle Borough	x	x	x	x		x	x	x	x	
Taylor Township	x	x	x	x		x	x	x	x	
Union Township	x	x	x	x		x	x	x	x	
Volant Borough	x	x	x	x		x	x	x	x	
Wampum Borough	x	x	x	x		x	x	x	x	
Washington Township	x	x	x	x		x	x	x	x	
Wayne Township	x	x	x	x		x	x	x	x	
Wilmington Township	x	x	x	x		x	x	x	x	
Lawrence County	x	x	x	x	x	x	x	x	x	x

Municipality	2.4.1	2.4.2	2.5.1	2.5.2	2.5.3	2.6.1	2.6.2	2.6.3	2.6.4	2.7.1
City of New Castle	x	x				x	x	x	x	x
Bessemer Borough	x					x	x	x	x	x
Ellport Borough	x					x	x	x	x	x
Ellwood City Borough	x					x	x	x	x	x
Enon Valley Borough	x			x		x	x	x	x	x
Hickory Township	x					x	x	x	x	x
Little Beaver Township	x					x	x	x	x	x
Mahoning Township	x					x	x	x	x	x
Neshannock Township	x					x	x	x	x	x
New Beaver Borough	x					x	x	x	x	x
New Wilmington Borough	x					x	x	x	x	x
North Beaver Township	x					x	x	x	x	x
Perry Township	x					x	x	x	x	x
Plain Grove Township	x					x	x	x	x	x
Pulaski Township	x		x			x	x	x	x	x
S.N.P.J. Borough	x					x	x	x	x	x
Scott Township	x					x	x	x	x	x
Shenango Township	x		x			x	x	x	x	x
Slippery Rock Township	x					x	x	x	x	x
South New Castle Borough	x					x	x	x	x	x
Taylor Township	x					x	x	x	x	x
Union Township	x					x	x	x	x	x
Volant Borough	x					x	x	x	x	x
Wampum Borough	x					x	x	x	x	x
Washington Township	x					x	x	x	x	x
Wayne Township	x		x			x	x	x	x	x
Wilmington Township	x		x			x	x	x	x	x
Lawrence County	x				x	x	x	x	x	x

Municipality	2.7.2	3.1.1	3.1.2	3.1.3	4.1.1	4.1.2	4.2.1	4.2.2	4.2.3	4.3.1
City of New Castle	x	x	x	x	x	x			x	x
Bessemer Borough		x	x	x	x	x			x	x
Ellport Borough		x	x	x	x	x			x	x
Ellwood City Borough		x	x	x	x	x			x	x
Enon Valley Borough	x	x	x	x	x	x			x	x
Hickory Township		x	x	x	x	x			x	x
Little Beaver Township		x	x	x	x	x			x	x
Mahoning Township		x	x	x	x	x			x	x
Neshannock Township	x	x	x	x	x	x			x	x
New Beaver Borough		x	x	x	x	x			x	x
New Wilmington Borough		x	x	x	x	x			x	x
North Beaver Township		x	x	x	x	x			x	x
Perry Township	x	x	x	x	x	x			x	x
Plain Grove Township		x	x	x	x	x			x	x
Pulaski Township		x	x	x	x	x			x	x
S.N.P.J. Borough		x	x	x	x	x			x	x
Scott Township		x	x	x	x	x			x	x
Shenango Township		x	x	x	x	x			x	x
Slippery Rock Township		x	x	x	x	x			x	x
South New Castle Borough		x	x	x	x	x			x	x
Taylor Township		x	x	x	x	x			x	x
Union Township	x	x	x	x	x	x			x	x
Volant Borough		x	x	x	x	x			x	x
Wampum Borough		x	x	x	x	x			x	x
Washington Township		x	x	x	x	x			x	x
Wayne Township		x	x	x	x	x			x	x
Wilmington Township		x	x	x	x	x			x	x
Lawrence County		x	x	x	x	x	x	x	x	x

Municipality	4.3.2	4.3.3								
City of New Castle	x	x								
Bessemer Borough	x	x								
Ellport Borough	x	x								
Ellwood City Borough	x	x								
Enon Valley Borough	x	x								
Hickory Township	x	x								
Little Beaver Township	x	x								
Mahoning Township	x	x								
Neshannock Township	x	x								
New Beaver Borough	x	x								
New Wilmington Borough	x	x								
North Beaver Township	x	x								
Perry Township	x	x								
Plain Grove Township	x	x								
Pulaski Township	x	x								
S.N.P.J. Borough	x	x								
Scott Township	x	x								
Shenango Township	x	x								
Slippery Rock Township	x	x								
South New Castle Borough	x	x								
Taylor Township	x	x								
Union Township	x	x								
Volant Borough	x	x								
Wampum Borough	x	x								
Washington Township	x	x								
Wayne Township	x	x								
Wilmington Township	x	x								
Lawrence County	x	x								

National Flood Insurance Program (NFIP) Related Mitigation Actions

The Federal Emergency Management Agency (FEMA) requires that every participating jurisdiction that either participates in the NFIP or has identified Special Flood Hazard Areas (SFHAs) have at least one specific action in its mitigation action plan that relates to continued compliance with the NFIP. Action numbers 1.1.1; 1.1.2; 2.1.1; 2.4.1; 4.1.1 and 4.1.2 comply for Lawrence County and all its municipalities.

Evaluate and Prioritize Mitigation Actions

Mitigation actions were evaluated using the seven criteria which frame the *PASTEEL* method. These feasibility criteria include:

- **Political:** Does the action have public and political support?
- **Administrative:** Is there adequate staffing and funding available to implement the action in a timely manner?
- **Social:** Will the action be acceptable by the community or will it cause any one segment of the population to be treated unfairly?
- **Technical:** How effective will the action be in avoiding or reducing future losses?
- **Economic:** What are the costs and benefits of the action and does it contribute to community economic goals?
- **Environmental:** Will the action provide environmental benefits and will it comply with local, state and federal environmental regulations?
- **Legal:** Does the community have the authority to implement the proposed measure?

The *PASTEEL* method uses political, administrative, social, technical, economic, environmental and legal considerations as a basis means of evaluating which of the identified actions should be considered most critical. Economic considerations are particularly important in weighing the costs versus benefits of implementing one action prior to another.

FEMA mitigation planning requirements indicate that any prioritization system used shall include a special emphasis on the extent to which benefits are maximized according to a cost-benefit review of the proposed projects. To do this in an efficient manner that is consistent with FEMA's guidance on using cost-benefit review in mitigation planning, the *PASTEEL* method was adapted to include a higher weighting for two elements of the *economic* feasibility factor – Benefits of Action and Costs of Action. This method incorporates concepts similar to those described in Method C of FEMA 386-5: Using Benefit Cost Review in Mitigation Planning (FEMA, 2007).

Those participating in the 2015 HMP update process provided comments which allowed for the prioritization of the mitigation actions using the seven *PASTEEL* criteria. In order to evaluate and prioritize the mitigation actions, *favorable* and *less favorable* factors were identified for each action. Appendix I summarizes the evaluation methodology and provides the results of this evaluation for all mitigation actions. The first results column includes a summary of the feasibility factors, placing equal weight on all factors. The second results column reflects feasibility scores with benefits and costs weighted more heavily; and therefore, given greater priority. A weighting factor of three was used for each benefit and cost element. Therefore, a "+" benefit factor rating equals three pluses and a "-" benefit factor rating equals three minuses in the total prioritization score.

7. Plan Maintenance

7.1. Update Process Summary

Monitoring, evaluating and updating this plan, is critical to maintaining its value and success in Lawrence County's hazard mitigation efforts. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and gives direction for the future. This section explains who will be responsible for maintenance activities and what those responsibilities entail. It also provides a methodology and schedule of maintenance activities including a description of how the public will be involved on a continued basis. The Lawrence County HMP Local Planning Team decided to alter the current maintenance procedures. The 2015 HMP update establishes a review of the plan within 30 days of a disaster event in addition to continuing with an annual plan evaluation. This HMP update also defines the municipalities' role in updating and evaluating the plan. Finally, the 2015 HMP Update encourages continued public involvement and how this plan may be integrated into other planning mechanisms in the county.

7.2. Monitoring, Evaluating and Updating the Plan

Hazard mitigation planning in Lawrence County is a responsibility of all levels of government (i.e., county and local), as well as the citizens of the county. The Lawrence County Local Planning Team will be responsible for maintaining this Multi-Jurisdictional HMP. The Local Planning Team will meet annually and following each emergency declaration to review the plan. Every municipality that has adopted this plan will also be afforded the opportunity to provide updated information or information specific to hazards encountered during an emergency or disaster. Each review process will ensure that the hazard vulnerability data and risk analysis reflect current conditions of the county, that the capabilities assessment accurately reflects local circumstances and that the hazard mitigation strategies are updated based on the county's damage assessment reports and local mitigation project priorities. The HMP must be updated on a five-year cycle. An updated HMP must be completed and approved by the end of the five year period. The monitoring, evaluating and updating of the plan every five years will rely heavily on the outcomes of the annual HMP Planning Team meetings.

The Lawrence County Local Planning Team will complete a Hazard Mitigation Progress Report to evaluate the status and accuracy of the Multi-Jurisdictional HMP and record the local planning team's review process. The Lawrence County Department of Public Safety will maintain a copy of these records and place them in Appendix J of this plan. Lawrence County will continue to work with all municipalities regarding hazard mitigation projects, especially those municipalities that did not submit projects for inclusion in this plan.

7.3. Incorporation into Other Planning Mechanisms

Lawrence County Comprehensive Plan

Article III of the Pennsylvania Municipalities Planning code (Act 247 of 1968, as reenacted and amended) requires all Pennsylvania counties (except Philadelphia) to adopt a comprehensive plan and update it at least every 10 years. The Lawrence County Commissioners adopted the updated Lawrence County Comprehensive Plan in 2004.

The Lawrence County Planning Department is responsible for maintaining and updating the Lawrence County Comprehensive Plan and many other regulatory tools. It uses this information to identify necessary revisions and to amend these plan, ordinances and other regulatory tools.

Technical assistance on community planning matters is provided to the Lawrence County Board of Commissioners through the Lawrence County Planning Department. The Planning Department administers the County Comprehensive Plan, along with the County Subdivision and Land Development Ordinance. The Planning Department also performs technical reviews of municipal subdivision and land development plans, municipal floodplain ordinances and other community planning and development matters.

The next scheduled complete update of the comprehensive plan will be by 2016, based on the municipalities planning code's 10-year review cycle. Certain sections of the county comprehensive plan may be updated prior to 2016. Coupling this requirement with the DMA 2000-required five-year update cycle for county hazard mitigation plans, when possible, will allow the county to better integrate the Lawrence County Comprehensive Plan and the Lawrence County Hazard Mitigation Plan planning processes and strengthen public participation for both efforts.

The risk assessment section 4.3.1 through 4.3.23; section 4.4.4; capability assessment section 5 and the mitigation strategy section 6 of the Lawrence County Hazard Mitigation Plan will provide valuable information for the update of the next comprehensive plan and any section specific updates prior to 2016. Consideration and incorporation of data from this plan will ensure the inclusion of hazard mitigation practices in the county comprehensive plan.

Lawrence County Emergency Operations Plan

The Pennsylvania Emergency Management Services Code, 35 PA C.S. Sections 7701-7707, as amended, requires each county and municipality to prepare, maintain and keep current an Emergency Operations Plan (EOP). Lawrence County Department of Public Safety is responsible for preparing and maintaining the county's EOP, which applies to both the county and municipal emergency management operations and procedures.

The EOP is reviewed at least biennially. Whenever portions of the plan are implemented in an emergency event or training exercise, a review is performed and changes are made where necessary. These changes are then distributed to the county's municipalities.

The complete risk assessment section, mitigation actions and mitigation project opportunities identified in the Lawrence County Hazard Mitigation Plan will assist with decreasing hazard specific risk and vulnerability. Understanding the risks and vulnerability in the county and municipalities will allow for emergency management and other response agencies to better direct planning, response and recovery aspects.

EMA should consider the Lawrence County Hazard Mitigation Plan during its biennial review of the county EOP. Recommended changes to the HMP will then be coordinated with the hazard mitigation local planning team.

Plan Interrelationships

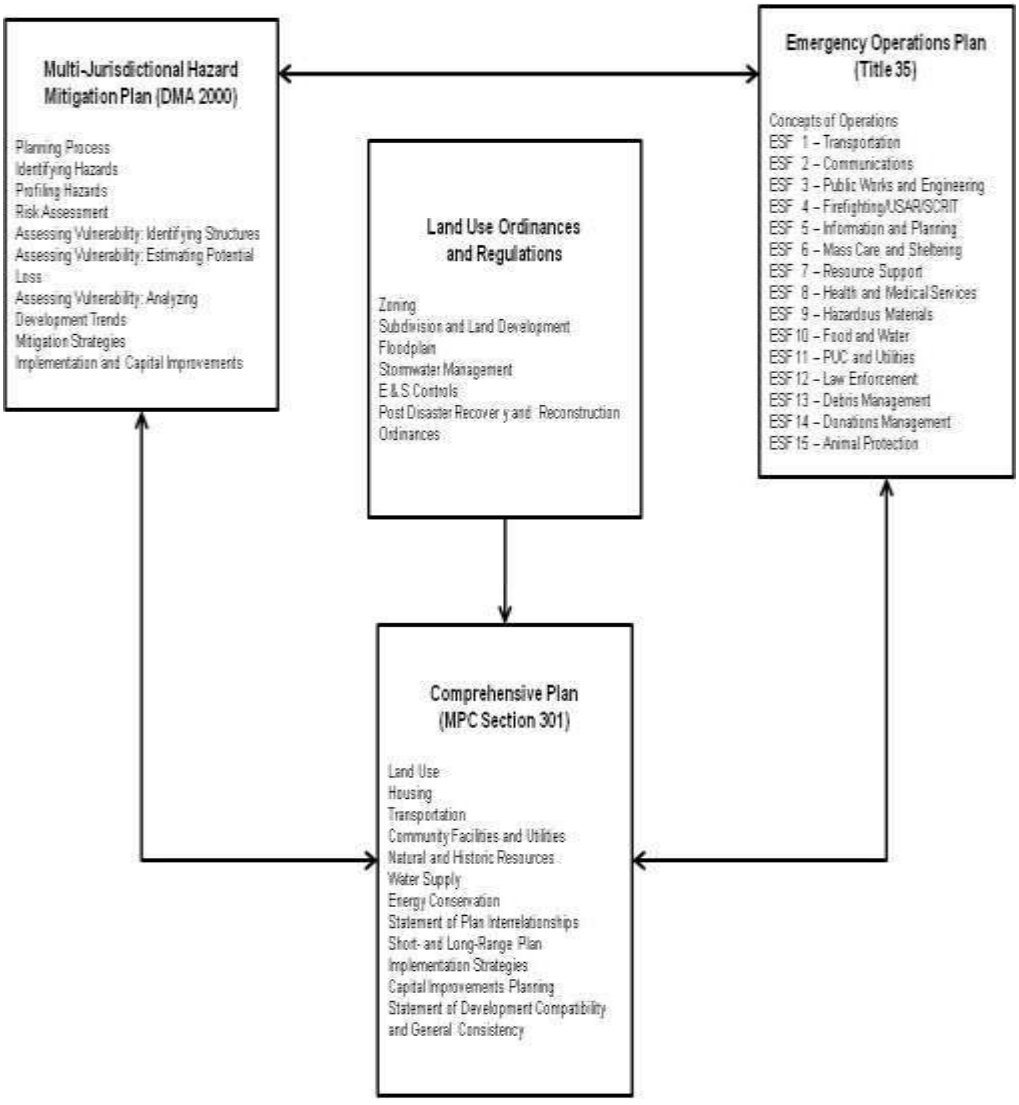
Figure 31 illustrates interrelationships between the Lawrence County Hazard Mitigation Plan, the Lawrence County Comprehensive Plan and the Lawrence County Emergency Operations Plan and other county and municipal planning mechanisms. Ensuring consistency between these planning mechanisms is critical. In fact, Section 301 (4.1) of the Pennsylvania Municipalities Planning Code requires that comprehensive plans include 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 multi-jurisdictional HMP, certain sections of the county comprehensive plan, EOP, and various land use ordinances and regulations provided key information. Moving forward, each of these documents should not be treated as unrelated and updated separately. The county and each participating municipality are responsible for incorporating the specific mitigation actions recommended in this plan into the necessary planning documents, including the appropriate comprehensive plan, the county EOP, and any land use ordinances and regulations.

For example, zoning and other land use regulations will be amended to reflect the newly identified hazard areas, to ensure that development in those areas is minimized or at least conducted in a way that otherwise mitigates against the effects of hazards (e.g., requiring structures built in the floodplain to be elevated). As proposed changes to building codes are presented, their potential for mitigating damage due to hazards will be examined, and the changes will only be adopted if they are shown to lower risk. Changes to stormwater management plans will incorporate identified mitigation actions and will encourage increased participation in the NFIP.

To that end, Lawrence County and its municipalities must ensure that the components of the hazard mitigation plan are integrated into existing community planning mechanisms and are generally consistent with goals, policies and recommended actions. Lawrence County and the hazard mitigation planning team will utilize the existing maintenance schedule of each plan to incorporate the goals, policies and recommended actions as each plan is updated.

Figure 31: Lawrence County and Municipal Plan Interrelationships



7.4. Continued Public Involvement

The Lawrence County Planning Department will ensure that the 2015 Lawrence County Hazard Mitigation Plan is posted and maintained on the Lawrence County website and

will continue to encourage public review and comment on the plan. The Lawrence County website that the plan will be located at is as follows: www.co.Lawrence.pa.us

The public will have access to the 2015 HMP through their local municipal office, the Lawrence County Planning Department, or the Lawrence County Department of Public Safety. Information on upcoming events related to the HMP or solicitation for comments will be announced via newsletters, newspapers, mailings, and the County website.

The citizens of Lawrence County are encouraged to submit their comments to elected officials and/or members of the Lawrence County HMP Local Planning Team. To promote public participation, the Lawrence County Local Planning Team will post a public comment form as well as the Hazard Mitigation Project Opportunity Form on the county's website. These forms will offer the public various opportunities to supply their comments and observations. All comments received will be maintained and considered by the Lawrence County Hazard Mitigation Planning Team.

8. Plan Adoption

8.1. Resolutions

In accordance with federal and state requirements, the governing bodies of each participating jurisdiction must review and adopt by resolution, the 2015 Lawrence County Hazard Mitigation Plan. Copies of the adopting resolutions are included in this plan in Appendix K. FEMA Region III in Philadelphia is the final approval authority for the Hazard Mitigation Plan. PEMA also reviews the plan before submission to FEMA.

9. Appendices

APPENDIX A: Bibliography

APPENDIX B: FEMA Local Mitigation Review Tool

APPENDIX C: Meetings and Support Documents

APPENDIX D: Municipal Flood Maps

APPENDIX E: Critical and Special Needs Facilities

APPENDIX F: 2010 Mitigation Project Opportunities

APPENDIX G: 2015 Mitigation Project Opportunities

APPENDIX H: 2015 HAZUS Report

APPENDIX I: 2015 PASTEEL Analysis

APPENDIX J: Annual Review Documentation

APPENDIX K: Lawrence County & Municipal Adoption Resolutions

APPENDIX A:
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APPENDIX B:
FEMA Local Mitigation Review Tool

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Lawrence County	**Title of Plan:** Lawrence County Multi-Jurisdictional Hazard Mitigation Plan Update	**Date of Plan:** September 1, 2015
Local Point of Contact: Michael Rearick	**Address:** 107 Kathy Ann Court McMurray, PA 15317	
Title: Senior Consultant		
Agency: MCM Consulting Group, Inc.		
Phone Number: 814-229-8063	**E-Mail:** mrearick@mcmconsultinggrp.com	

State Reviewer: Ernest Szabo	**Title:** State HM Planner	**Date:** October 16, 2015

FEMA Reviewer: Alison Kearns	**Title:** Community Planner	**Date:** December 31, 2015
Date Received in FEMA Region ***(insert #)***	October 26, 2015 December 22, 2015	
Plan Not Approved		
Plan Approvable Pending Adoption	December 31, 2015	
Plan Approved		

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 3 (p 27-32) Appendix C	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 3 (p 28-32) Appendix C	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 3 (p 30-31) Appendix C	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 1 (p 10-11) Section 2 (p 21-26) Section 3 (p 32-33)	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 7 (p 204)	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 7 (p 202-204)	X	
ELEMENT A: REQUIRED REVISIONS			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4 (p 37-145) Appendix D	X	

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4 (p 45-145)	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 4 (p 45-158) Appendix D Appendix H	X	
B4. Does the Plan address NFIP insured **structures** within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	NA	X	
ELEMENT B: REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 5 (p 161-174)	X	
C2. Does the Plan address each jurisdiction's **participation** in the NFIP and continued compliance with **NFIP** requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 4 (p 63-64) Section 5 (p 161-164)	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6 (p 186)	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 6 (p 189-195) Appendix F Appendix G	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 6 (p 196-201) Appendix I	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 3 (p 32-33) Section 7 (p 203-204)	X	
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 2 (p 19-20) Section 4 (p 158-159)	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 6 (p 175-185)	X	

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4 (p 34-35) Section 5 (p 160-161) Section 6 (p 189-202)	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Section 8 Appendix K	NA	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Section 8 Appendix K	NA	
ELEMENT E: REQUIRED REVISIONS The following jurisdictions did not participate in any meetings nor submit surveys. By not participating in this planning process, they are not eligible to adopt the hazard mitigation plan. Bessemer Borough Ellwood City Borough Little Beaver Township Mahoning Township North Beaver Township Plain Grove Township SNPJ Borough Scott Township Slippery Rock Township Taylor Township			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

(These might be helpful if interested)

FEMA's Plan Integration Guide (https://www.fema.gov/media-library/assets/documents/108893)
FEMA's FY15 HMA Unified Guidance (https://www.fema.gov/media-library/assets/documents/103279)
FEMA's Mitigation Ideas (https://www.fema.gov/media-library/assets/documents/30627)
Beyond the Basics Website (http://mitigationguide.org/)
Region 3 Risk MAP (http://riskmap3.com/)
Training Topics:

- GIS (ex. E190, Online ESRI Courses)
- HAZUS (ex. EMI Professional or Practitioner Track)
- BCA Toolkit (ex. E-276)
- Floodplain Management (ex. L-273)
- NFIP/ CRS (ex. E-278)
- Mitigation Planning (ex. G-318 or G-393)
- HMA Application Development (ex. L-212, L-213, L-214)

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require-ments
1												
2												
3												
4												
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7												
8												
9												

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require-ments
10												
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20												

APPENDIX C:
Meetings and Support Documents

Hazard Mitigation Plan

- 2015 Hazard Mitigation Plan
- Additional Resources:
  - Lawrence County Department of Public Safety
    - http://www.leoc.net/about
  - FEMA Hazard Mitigation
    - http://www.fema.gov/hazard-mitigation-planning-resources

Lawrence County Government Center
430 Court Street
New Castle, PA 16101-3503
724-658-2541

PUBLIC MEETING NOTICE

A public meeting to review the Draft 2015 Lawrence County Multi Jurisdictional Hazard Mitigation Plan will be conducted on September 1, 2015 at 11:00 am at the Lawrence County Government Center in the Commissioner's Meeting Room located at 430 Court Street, New Castle, PA 16101. The mitigation plan outlines natural and man-made hazard risks and strategies to mitigate the risks specific to Lawrence County and all the Lawrence County Municipalities. An electronic copy of the draft plan may be downloaded and reviewed at: http://co.lawrence.pa.us. A paper copy of the plan will be available at the Department of Planning and Community Development. All public comments must be submitted n writing no later than October 1, 2015 at 4:00 pm to Allen Miller, Deputy Director of Planning, at the Lawrence County Department of Planning and Community Development.

Legal: August 28, 2015

AFFP
NOTICE OF PUBLIC HEARING

Affidavit of Publication

STATE OF PA }
COUNTY OF LAWRENCE SS
COUNTY }

Jamie DeMetro, being duly sworn, says:

That she is Classified Clerk of the New Castle News, a daily newspaper of general circulation, printed and published in New Castle, Lawrence County County, PA; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:
August 28, 2015

PUBLIC MEETING NOTICE
A public meeting to review the Draft 2015 Lawrence County Multi Jurisdictional Hazard Mitigation Plan will be conducted on September 1, 2015 at 11:00 am at the Lawrence County Government Center in the Commissioner's Meeting Room located at 430 Court Street, New Castle, PA 16101. The mitigation plan outlines natural and man-made hazard risks and strategies to mitigate the risks specific to Lawrence County and all the Lawrence County Municipalities. An electronic copy of the draft plan may be downloaded and reviewed at: http://co.lawrence.pa.us. A paper copy of the plan will be available at the Department of Planning and Community Development. All public comments must be submitted n writing no later than October 1, 2015 at 4:00 pm to Allen Miller, Deputy Director of Planning, at the Lawrence County Department of Planning and Community Development.
Legal: August 28, 2015

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

Classified Clerk

Subscribed to and sworn to me this 28th day of August 2015.

Rita Gruber

, , Lawrence County County, PA

My commission expires: February 10, 2016

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Rita Gruber, Notary Public
City of New Castle, Lawrence County
My Commission Expires Feb. 10, 2016
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

00005076 00077689

LAWRENCE COUNTY PLANNING COMM
430 COURT STREET
NEW CASTLE, PA 16101

PUBLIC MEETING NOTICE

A public meeting to review the Draft 2015 Lawrence County Multi Jurisdictional Hazard Mitigation Plan will be conducted on September 1, 2015 at 11:00 am at the Lawrence County Government Center in the Commissioner's Meeting Room located at 430 Court Street, New Castle, PA 16101. The mitigation plan outlines natural and man-made hazard risks and strategies to mitigate the risks specific to Lawrence County and all the Lawrence County Municipalities. An electronic copy of the draft plan may be downloaded and reviewed at: http://co.lawrence.pa.us. A paper copy of the plan will be available at the Department of Planning and Community Development. All public comments must be submitted n writing no later than October 1, 2015 at 4:00 pm to Allen Miller, Deputy Director of Planning, at the Lawrence County Department of Planning and Community Development.
Legal: August 28, 2015

Post Details

Reported stats may be delayed from what appears on posts

Lawrence County Department of Planning & Community Development

Published by Allen Miller · August 6 at 3:05pm · Edited ·

Lawrence County is in the process of updating the County's Hazard Mitigation Plan. A public meeting for review of the draft plan has been scheduled for September 1, 2015 at 11:00 am in the Commissioner's Meeting Room at the Lawrence County Government Center.

The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation Plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. FEMA requires that local governments develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

3 Likes

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Lawrence County Department of Planning & Community Development
Published by Allen Miller · Yesterday at 9:05am · Edited ·

REMINDER: A public meeting for review of the draft Hazard Mitigation Plan has been scheduled for tomorrow, September 1, 2015 at 11:00 am in the Commissioner's Meeting Room at the Lawrence County Government Center.

The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation Plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. FEMA requires that local governments develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

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Lawrence County Department of Planning & Community Development
Published by Allen Miller · 1 min · Edited ·

The DRAFT of the 2015 Lawrence County Hazard Mitigation Plan is available at the link below.

Public Comments can be submitted in writing no later than October 1, 2015 at 4:00pm to Allen Miller, Deputy Director of Planning, Lawrence County Department of Planning and Community Development, 430 Court Street, New Castle, PA 16101

2015 Lawrence County Hazard Mitigation Plan Draft
CO.LAWRENCE.PA.US

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Department of Planning & opment
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UPCOMING EVENTS

Experience Lawrence County
Saturday, September 19, 2015 at 8:30am
William Galbreath is going

Lawrence County Hazard Mitigation Plan Update

Draft Hazard Mitigation Plan
Public Meeting
September 1, 2015

Why is a Hazard Mitigation Plan necessary?

Disaster Mitigation Act of 2000 (DMA 2000) which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act), requires **all local jurisdictions** to have a mitigation plan in order to receive certain types of disaster assistance and hazard mitigation funding.

2015 Hazard Mitigation Plan Update

- Required to be updated every 5 years
- Update process is continuous
- All plans are reviewed annually
- Annual progress reports are required by PEMA

2015 Hazard Mitigation Plan Update

- Lawrence County Hazard Mitigation Grant
- Hired MCM Consulting Group, Inc.
- Local Planning Team Developed
- Update process began
  - Capabilities Assessment
  - Risk Assessment
  - Mitigation Strategy Develop
  - Draft Plan

Lawrence County
Hazard Mitigation Plan Update

2015 Hazard Mitigation Plan Update

- FEMA Hazard Mitigation Plan Update Crosswalk
  - Checklist to ensure that each plan meets minimum requirements
  - Completed and submitted with the draft plan
  - Appendix B of the 2015 Hazard Mitigation Plan

Lawrence County
Hazard Mitigation Plan Update

Capabilities Assessment

- Assessed the county and the municipalities.
- Capability assessment forms provided.
- Assessed the following:
  - Planning and regulatory capability
  - Administrative and technical capability
  - Fiscal capability
  - Community political capability
- Capability assessment information is in section 5 of the 2015 Lawrence County Hazard Mitigation Plan.

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Identifying Hazards

44 CFR Requirement
Part 201 5(c)(2)(i): The risk assessment shall include a description of the type of all [hazards] that can affect the jurisdiction.

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Identifying Hazards

- Note and Document Past Disaster Declarations
- Develop a List of Natural and Human-Made Hazards
  - Review previous hazards in current plan
  - Identify new hazards
  - Municipality and County completion of the Hazard Identification and Risk Assessment Worksheet

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Profiling Hazards

44 CFR Requirement

Part 201 6(c)(2)(i): The risk assessment shall include a description of the location and extent of all [hazards] that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Profiling Hazards

- Identified the location and geographic extent
  - Mapping utilized
- Define the range and magnitude
  - Use of Fujita Scale
  - Use of Richter Scale
- Profile past occurrences
  - Dates
  - Impact

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Profiling Hazards

- Establish probability of future occurrences
  - Based on past occurrence frequency
  - Special Flood Hazard Area (SFHA)
- Determine environmental impacts
  - Flooding causes polluted streams
  - Tornado causes scattering of debris over large areas
  - Droughts kill crops and trees

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

- Inventory and Summarize vulnerable assets
  - Existing buildings
  - Critical facilities
  - New development
  - Hazardous material facilities
  - Utility Systems
- Utilize and update GIS data

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

- Reviewed high risk groups
  - Elderly
  - Children
  - Special needs
- Flooding hazards
  - Utilized Flood Insurance Rate Maps
  - Developed maps with critical facilities and impacted structures

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

- Develop risk factor for hazards
  - 23 hazards identified and profiled
  - Assessed risk factor to 24 hazards
    - Tornado and windstorms
  - Utilized a risk factor tool
  - Relies on historical data
  - Relies on local knowledge
  - Completed by the local planning team

Summary of Risk Factor (RF) Approach

Risk Assessment Category	Degree of Risk			Weight Value
	Level	Criteria	Index	
PROBABILITY *What is the likelihood of a hazard event occurring in a given year?*	**UNLIKELY**	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1% & 49.9% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 50% & 90% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	GREATER THAN 90% ANNUAL PROBABILITY	4	
IMPACT *In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?*	**MINOR**	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT *How large of an area could be impacted by a hazard event? Are impacts localized or regional?*	**NEGLIGIBLE**	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10.9% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 11 & 25% OF AREA AFFECTED	3	
	LARGE	GREATER THAN 25% OF AREA AFFECTED	4	
WARNING TIME *Is there usually some lead time associated with the hazard event? Have warning measures been implemented?*	**MORE THAN 24 HRS**	SELF-DEFINED	1	10%
	12 TO 24 HRS	SELF-DEFINED	2	
	6 TO 12 HRS	SELF-DEFINED	3	
	LESS THAN 6 HRS	SELF-DEFINED	4	
DURATION *How long does the hazard event usually last?*	**LESS THAN 6 HRS**	SELF-DEFINED	1	10%
	LESS THAN 24 HRS	SELF-DEFINED	2	
	LESS THAN 1 WEEK	SELF-DEFINED	3	
	MORE THAN 1 WEEK	SELF-DEFINED	4	

(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

High Risk Hazards:

- Environmental Hazards
- Winter Storms
- Flood, Flash Flood and Ice Jam Flooding
- Wind Storms
- Invasive Species
- Drought
- Disorientation
  Transportation Accidents
- Radon

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

Moderate Risk Hazards:
- Urban Fire and Explosions
- Nuclear
- Tornadoes
- Earthquakes
- Drowning
- Wildfire
- Lightning Strikes
- Civil Disturbance
- Pandemic and Infectious Disease
- Terrorism
- Extreme Temperature
- Utility Interruptions

Lawrence County
Hazard Mitigation Plan Update

Risk Assessment Review
Assessing Vulnerability

Low Risk Hazards:
- Dam Failure
- Hurricane / Tropical Storm
- Landslides

Lawrence County
Hazard Mitigation Plan Update

Mitigation Strategy

44 CFR Requirement

Part 201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Lawrence County
Hazard Mitigation Plan Update

Mitigation Strategy
Goals and Objectives Review

What is a goal?
A general guideline that describes what your community would like to achieve.

What is an objective?
Defines strategies that must be implemented to achieve the goals. Objectives are specific and measurable.

2015 Mitigation Goals and Objectives next slide.

GOAL 1	Direct county and local governments to help protect life and property from natural and manmade disasters.
Objective 1.1	Improving enforcement of floodplain regulations within the county
Objective 1.2	The county and its municipalities will continue sewer and storm drain management
Objective 1.3	The county and its municipalities will prepare for post disaster events
Objective 1.4	Continue to support Region 13 efforts for a fusion center for threat intelligence and law enforcement
Objective 1.5	County will work with municipalities and municipality first responders to encourage regionalization to provide better public safety services
GOAL 2	Take measures that will reduce vulnerability to hazards identified in this hazard mitigation plan
Objective 2.1	Inform public to elevate and protect all systems vital to their operation
Objective 2.2	Develop warning devices to notify public in a hazard emergency
Objective 2.3	Work with public and private utility providers to maintain aging infrastructure
Objective 2.4	Acquisition/relocation of property in the floodplain.
Objective 2.5	Stream bank/bed management and restoration will be implemented to reduce flooding in certain areas of the county
Objective 2.6	Assist public safety agencies in reducing the impacts to the public after a hazard event has occurred
Objective 2.7	Mitigate damage to roads, drainage and utilities by requiring that reconstruction be built to standard.
GOAL 3	*To improve tracking of hazards and mitigation actions.*
Objective 3.1	Use GIS and existing technologies to cost effectively track mitigation projects.
GOAL 4	*Generate more public involvement in the hazard mitigation plan maintenance and update process*
Objective 4.1	Educate the residents on the National Flood Insurance Program
Objective 4.2	Provide access to emergency preparedness guides
Objective 4.3	Conduct workshops and seminars for all high hazards

Lawrence County
Hazard Mitigation Plan Update

Mitigation Strategy
Mitigation Actions

44 CFR Requirement

Part 201 (6)(3)(ii). [The mitigation strategy shall include a section that identifies] 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.

What is a Mitigation Action?

An action is more specific than an objective and should address previously identified objectives.

Lawrence County
Hazard Mitigation Plan Update

Mitigation Strategy
Mitigation Actions

- 2015 Mitigation Actions:
  - 42 Actions updated or developed.
  - Renumbered all action numbers.
  - Located in Section 6 of the mitigation plan.

Lawrence County
Hazard Mitigation Plan Update

Mitigation Strategy
Mitigation Project Opportunities

- 2010 Mitigation Opportunities:
  - Opportunities identified in the 2010 mitigation plan.
  - The projects are in progress or have not been started.
  - Funding may be needed or there may be other needs.
  - 25 valid projects from 8 municipalities to incorporate in the 2015 update.
  - Information is in Appendix F
- 2015 Mitigation Opportunities:
  - 50 new mitigation opportunities
  - Information is in Appendix G

Lawrence County
Hazard Mitigation Plan Update

Next Steps

- Available for public comment
  - Comment Period is September 1, 2015 – October 1, 2015
  - Hard copy available: Lawrence County EMA
  - Digital copies are available at: www.co.Lawrence.pa.us
  - All public comments **MUST** be submitted in writing to Allen Miller, Lawrence County Deputy Director of Planning
- Draft submit to PEMA by October 10, 2015
- FEMA review and approval pending adoption
- County and municipality adoption
  - Completed by resolution

Lawrence County
Hazard Mitigation Plan Update

Conclusion

Questions??

Thank You

SIGN IN SHEET
Lawrence County HMP Update
Draft Plan Public Meeting
September 1, 2015

NAME	MUNICIPALITY YOU LIVE IN
Deb Wapleton - New Castle Twp	
Abby Miller - LC Planning	
Robert Ed Segnine Commissioner	
STEVE CRAIG COMMISSIONER	
JIM GARFLAND JR L. COUNTY	
Amy McKinney L County	
BRIAN MELLON LCOPS	

County plans for potential disasters

By Debbie Wachter

New Castle News | Posted: Wednesday, September 2, 2015 4:30 am

Flooding and high wind storms are natural hazards that have typically plagued Lawrence County.

But the Pennsylvania and Federal Emergency Management Agencies want counties throughout Pennsylvania to plan for any type of disaster and put that planning on paper so they can qualify for funding and assistance following any type of a large-scale emergency. The higher agencies also are demanding the input and participation of individual municipalities in the document, showing how they will respond should larger-scale emergencies arise within the county's borders.

The county commissioners in response to the Disaster Mitigation Act of 2000 in 2004 spearheaded the initial countywide hazard mitigation planning effort to prepare, adopt and implement the multi-jurisdictional Hazard Mitigation Plan for the county and its 27 municipalities. A local hazard mitigation planning team was initially developed comprised of government leaders and citizens from Lawrence County, and the plan was updated in 2010 and has been put to use.

The county departments of public safety and planning were appointed to update the plan, this year. MCM Consulting Group, Inc. of McMurray, Pa., was selected to complete this year's update. Hazard mitigation describes sustained actions taken to prevent or minimize long-term risks to life and property from hazards and to create successive benefits over time, according to the plan.

A core assumption of mitigation is that dollars invested in mitigation practices will significantly reduce future costs by lessening the amount needed for recovery, repair and reconstruction. These mitigation practices will also enable local residents, businesses and industries to re-establish themselves in the wake of a disaster, getting the economy back on track sooner and with less interruption, the plan indicates.

The voluminous document details how the county will respond to any type of manmade or natural emergency occurrence here. A directive of PEMA and FEMA is that each county update its plan every five years.

Lawrence County's plan has a list of added possible scenarios that possibly could occur here, and a list detailing which are most likely to happen and affect the most people. The identified risks are hazards that can affect any county or municipality, according to Michael Rearick of MCM Consulting Group. The list was developed by looking at past occurrences and disaster declarations in the county and identifying new potential hazards, he said.

They include environmental, winter storms, possible shale drilling accidents, flooding, wind storms, invasive species, drought, transportation incidents and accidents, radon, terrorism, earthquakes, hurricanes and tropical storms, wildfire, civil disturbance, drowning, disorientation, flash floods, lightning, dam failure, urban fires or explosions and utility interruption.

The plan includes how many of those occurrences have occurred in the county and where, and provides a lot of other demographic and geographic details including the numbers of wells, the county's top employers including school districts and other information.

County public safety director Brian Melcer noted that the agency used the plan as a tool when evaluating sites for location of the new public safety building and 911 center, which is under construction.

The commissioners Tuesday conducted a public hearing to present the draft of the update. No members of the public attended.

The plan is available for public review on the planning and community development page of the county's website, at co.lawrence.pa.us. Hard copies are available for review at the 911 center in the Cathedral and in the county planning office on the first floor of the courthouse. The plan is to be submitted to PEMA and FEMA by Oct. 10, and upon their approval, it must be approved by resolution by the commissioners and the 27 municipalities.

A public comment period is open until Oct. 1, and anyone who reviews it and wants to comment must do so in writing and address it to Allen Miller, Lawrence County Planning Department, Lawrence County Courthouse, 430 Court St., New Castle, Pa., 16101.

The county used a FEMA grant of $47,500 that came from the federal response and mitigation from severe flooding in 2011 and the subsequent issuance of a presidential disaster declaration in Pennsylvania. The commissioners contracted with MCM Consulting Group Inc. for that amount for this year's update. Rearick, the company's director of client outreach, worked with county public safety officials and he presented the proposed draft at Tuesday's hearing.

(Email:* dwachter@ncnewsonline.com*)

-OFFICE OF-
LAWRENCE COUNTY DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
LAWRENCE COUNTY GOVERNMENT CENTER
430 COURT STREET
NEW CASTLE, PENNSYLVANIA 16101
724-656-2144
724-656-2151 (fax)
E-mail: amckinney@co.lawrence.pa.us

AMY B. McKINNEY,
DIRECTOR
FAIR HOUSING OFFICER

COUNTY COMMISSIONERS
DAN VOGLER,
CHAIRMAN
ROBERT DEL SIGNORE, SR.
STEVE CRAIG

STAFF
ALLEN MILLER,
DEPUTY DIRECTOR OF PLANNING
DONIELE RUSSELL,
DEPUTY DIRECTOR OF COMMUNITY DEVELOPMENT
SARA KNAPP,
SHARED GREENWAYS AND ENVIRONMENTAL PLANNER

MEMORANDUM

TO: Lawrence County Municipalities

FROM: Allen J. Miller, Deputy Director of Planning AJM

SUBJECT: **2015 UPDATE OF THE LAWRENCE COUNTY HAZARD MITIGATION PLAN**

DATE: 9/2/2015

The Lawrence County Commissioners have been tasked with completing an update to the current Lawrence County Hazard Mitigation Plan. The Lawrence County Hazard Mitigation Plan was adopted by the Lawrence County Commissioners in 2010. Most municipalities in Lawrence County adopted the 2010 Lawrence County Hazard Mitigation Plan as the municipal hazard mitigation plan. **Each County and Municipality is required under the Federal Disaster Mitigation Act of 2000 to have a current and adopted hazard mitigation plan.** The hazard mitigation plan is used to support requests for public assistance and individual assistance after a federally declared disaster. **Without a FEMA approved plan the municipality may be ineligible for assistance.**

It is important that the municipalities within Lawrence County have the ability to review and comment on the updated draft Lawrence County Hazard Mitigation Plan. The draft plan is available at the Lawrence County website, www.co.lawrence.pa.us . If you would like to have a digital copy sent to you, please feel free to contact the Lawrence County Department of Planning & Community Development. If you have comments in reference to the plan, please forward your comments in writing to the attention of Allen Miller.

If you have any questions, please feel free to contact Michael T. Rearick, Senior Consultant with MCM Consulting Group, Inc. at 814-229-8063 or contact Allen Miller at the Lawrence County Department of Planning & Community Development at 724-656-1907.

Lawrence County HMP
Project Team Meeting Minutes

October 17, 2013 10:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

PRESENT: Allen Miller, Lawrence Co. Planning Department
Debbie Henson, Lawrence Co. Public Safety
Mike Rearick MCM Consulting Group, Inc.

Introductions:

Introductions completed by all attendees.

New Business:

- Ed Hoffman and Mike Rearick reviewed the draft project schedule.
- Ed Hoffman and Mike Rearick discussed the process that will be utilized by MCM to complete the project.
- Ed Hoffman and Mike Rearick obtained a digital copy of the current HMP and the Commodity Flow study.

Action Items

- Allen Miller and Debbie Hensen will provide MCM with the names of Project Team members.
- Lawrence County will provide MCM with a list of people that will be on the Planning Team.

Next meeting will be a conference call meeting at 10:00 A.M. on 11/20/2013. The conference bridge number is 1-877-252-4049, passcode of 6565

SIGN IN SHEET
Lawrence County HMP:
October 17, 2013:

NAME	COMPANY	CONTACT #	EMAIL
Debbie Henson	Dept of Public Safety	724-202-7106	lcema@co.lawrence.pa.us
Allen Miller	LC Planning	724-656-1907	amiller@co.lawrence.pa.us
Mike Rockwell	MCM Consulting	814-229-5063	mrocwell@mcmconsultinggrp.com
Ed Hoffman	MCM Consulting	814-335-2427	ehoffman@mcmconsultinggrp.com

Lawrence County HMP
Initial Meeting Agenda
October 17, 2013

Welcome and Introductions.

Project Schedule:

- Review of draft project schedule
- HVA
- Copy of Current Plan
- Identify Project and Planning team members
- Conference call on 10/30/2013
- On site meeting on 11/06/2013

General Discussion.

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 10/30/2013

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Mike Rearick	MCM		
Allen Miller	Lawrence County Dps		
Debbie Henson	Lawrence County DPS		
Matt Staniszewski	City of New Castle		
Brian Melcer	Lawrence County Dps		
Amy Mckinney	Lawrence County		

Lawrence County
HMP
Project Team Meeting Agenda

October 30, 2013 09:30 A.M.

Introductions:

Welcome and Introductions

Business:

- Review of project schedule/meeting change on November 6,2013?
- Development of Planning Team.

Action Items

- Next steps in the HMP Process will be redrafting the Community Profile section.
- Next meeting will be a conference call meeting on 11/20/2013 at 0930 utilizing the MCM phone bridge.

Lawrence County HMP
Project Team Meeting Minutes

November 20, 2013 10:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present: Mike Rearick MCM Consulting Group, Inc.
Mike McGrady, MCM Consulting Group, Inc.
Allen Miller, Lawrence County Planning
Amy McKinney, Lawrence County Planning

Introductions:

Introductions completed by all attendees.

New Business:

- Ed Hoffman reviewed the draft project schedule.
- The Community profile section will be reviewed and updated at the December 4, 2013 meeting.

Old Business:

- Ed Hoffman requested that Lawrence County provide MCM with a list of people that will be on the Planning Team.
- Ed Hoffman requested that Lawrence County provide MCM with the number of project books needed.

Action Items

- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Amy McKinney will verify how many project books will be needed for Lawrence County.
- Next meeting will be at the Lawrence County Public Safety building on December 4, 2013 at 09:30 A.M.

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 11/20/2013

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Mike Rearick	MCM		
Allen Miller	Lawrence County Dps		
Debbie Henson	Lawrence County DPS		
Matt Staniszewski	City of New Castle		
Brian Melcer	Lawrence County Dps		
Amy Mckinney	Lawrence County		

Lawrence County HMP
Meeting Agenda

November 20, 2013 10:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Project Schedule
- Lawrence County Planning Team Members
- Project Books
- Review of Section 2 Community Profile

Action Items

- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.
- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Next meeting will be an on-site meeting at 09:30 A.M. on 12/04/2013.

Lawrence County
HMP
Project Team Meeting Minutes

December 4, 2013 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present:

Allen Miller, Lawrence Co. Planning

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule.
- The Community profile section will be reviewed and updated at the December 18th conference call meeting.
- Allen has the letters ready to send to the planning team members once he receives the contact information.

Action Items

- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Amy will verify how many project books will be needed.
- Next meeting will be a conference call on December 18, 2013 at 0930.

SIGN IN SHEET
Lawrence County HMP:
December 4 2013:

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Lawrence County	724-656-1907	[redacted] amiller@co.lawrence.pa.us

Lawrence County HMP
Meeting Agenda

December 4, 2013 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Lawrence County Planning Team Members
- Project Books
- Review of Section 2 Community Profile

Action Items

- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.
- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Amy McKinney will verify how many project books will be needed for Lawrence County.
- Next meeting will be a conference call at 09:30 A.M. on 12/18/2013.

Lawrence County HMP
Project Team Meeting Minutes

December 18, 2013 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present: Allen Miller, Lawrence Co. Planning
Amy McKinney, Lawrence Co. Planning

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule.
- The Community profile section will be reviewed and updated at the January15, 2014 on-site meeting.
- Allen Miller has sent letters to the planning team.

Action Items

- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Draft Community will be reviewed at the next meeting.
- Next meeting will be a conference call on January 29, 2014 at 09:30 A.M.

Lawrence County HMP
Meeting Agenda

December 18, 2013 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Lawrence County Planning Team Members
- Project Books
- Review of Section 2 Community Profile

Action Items

- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.
- Lawrence County will provide MCM with a list of people that will be on the Planning Team.
- Next meeting will be on-site at Lawrence County DES at 09:30 A.M. on 01/15/2014.

Lawrence County HMP
Planning Team Meeting Minutes

January 15, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present:
Dan Vogler, Lawrence Co. Commissioner
Jim Gagliano, Lawrence Co. Administration
Allen Miller, Lawrence Co. Planning
Amy McKinney Lawrence Co. Planning
Tina Marshall, Lawrence Co. DPS
JoAnn McCready, Lawrence Co Conservation District
Matt Staniszewski, City of New Castle
Dave Harding, PennDOT
Stephen Schuster, Ellwood City School District
Jim Gagliano, Lawrence Co.
Jane Wood, Westminster College,

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule and outlined how the update process will move forward.
- The Community Profile section will be reviewed and updated at the January29, 2014 conference call.
- Ed will send all planning team members digital copies of the current HMP.

Action Items

- The draft Community Profile will be reviewed at the next meeting.
- Next meeting will be a conference call on January 29, 2014 at 09:30 A.M.
- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.

SIGN IN SHEET

PROJECT: Lawrence County HMP Planning Team Meeting

DATE: January 15, 2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Lawrence Co	724-656-1907	a.miller@co.lawrence.pa.us
Amy McKinney	Lawrence Co	724-656-2193	amckinney@co.lawrence.pa.us
TINA Marshall	LAWRENCE CO D.P.S	724 202-7105	tmarshall@co.Lawrence.pa.us
JoAnn McCready	Lawrence Co Conservation District	7246524512	jmccready@lawrencecd.org
MATT STANISZEWSKI	CITY OF NEW CASTLE	724-656-3540	mds @ NEWCASTLEPA.ORG
Dave Harding	Lawrence County Penn DOT	724-656-3104	daharding@pa.gov
STEPHEN SCHUSTER	ELLWOOD CITY SCHOOL DIST	724 752 1591	SSCHUSTER@ELLWOOD.K12.PA.US ~~NET~~
JIM GAGLIANO JR	LAWRENCE COUNTY	724-656-2175	jgagliano@co.lawrence.pa.us
Jane Wood	Westminster College	724-946-7123	woodjm@westminster.edu
DAN VOGLER	Lawrence Co Commissioner	724 656 2163	dvoglerc@co.lawrence.pa.us

SIGN IN SHEET

PROJECT: Lawrence County HMP Project Team Meeting

DATE: January 15, 2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Lawrence Co	724-656-1907	amillerlco.lawrence.pa.us

Lawrence County HMP
Meeting Agenda

January 15, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Lawrence County Planning Team Members
- Project Books
- Review of Section 2 Community Profile

Action Items

- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.
- Next meeting will be a conference call at 09:30 A.M. on 01/29/2014.

Lawrence County HMP
Meeting Agenda

February 5, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Review risk assessment forms and Hazard Profiles.
- Review draft of Section 2 Community Profile

Action Items

- Next meeting will be a conference call on 02/19/2014 @ 0930.
- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 02/19/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Mike Rearick	MCM		
Tina Marshall	Lawrence County Dps		
Debbie Henson	Lawrence County DPS		
Stephen Schuster	Ellwood City School		
Allen Miller	Lawrence County Dps		
Amy Mckinney	Lawrence County		

Lawrence County HMP
Meeting Agenda

February 19, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Review capability forms and Hazard Profiles.

Action Items

- Next meeting will be on site on 03/05/2014 @ 0930 for the Project Team and Planning Team meeting at 1100 at Lawrence County EOC.

Lawrence County HMP
Planning Team Meeting
Minutes

March 5, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present: Allen Miller, Lawrence Co. Planning, Amy McKinney Lawrence Co. Planning, Brian Melcer, Stephen Schuster, Ellwood High School

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule and outlined how the update process will move forward.
- Review of Draft Pandemic and Terrorism Profiles
- Discussed locations for Municipal Meetings. Proposed one in the New Castle and Ellwood City Area.
- Capability Assessments will be sent out.

Action Items

- Hazard Profiles will be reviewed at the next Phone conference meeting.
- Dial in number for the conference call is 1-877-252-4049, passcode of 6565. 0930 A.M.

SIGN IN SHEET
PROJECT: Lawrence County HMP
DATE: March 5, 2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Lawrence Co	724-656-1907	[illegible] am.lib@co.lawrence.pa.us
Amy McKinney	Lawrence Co	724-658-2193	amckinney@co.lawrence.pa.us
STEPHEN SCHUSTER	ELLWOOD HIGH SCHOOL	724 714 3608	SSCHUSTER@ELLWOOD.K12.PA.US

Lawrence County HMP
Meeting Agenda

March 5, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Review assessment survey forms and draft Hazard Profiles.

Action Items

- Next meeting will be a conference call on 03/19/2014 @ 0930.
- Dial in number for the conference call is 1-877-252-4049, passcode of 6565.

Lawrence County HMP
Planning Team Meeting
Minutes

March 19, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present: Allen Miller, Lawrence Co. Planning, Amy McKinney Lawrence Co. Planning, Stephen Schuster, Ellwood High School, JoAnn McCready, Lawrence Co.

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule and outlined how the update process will move forward.
- Review of Draft Landslide and Extreme Temperature Profiles
- Discussed locations for Municipal Meetings. Proposed one in the New Castle and Ellwood City Area.
- Allen advised that the Capability Assessments were sent out.

Action Items

- Hazard Profiles and Capability Assesments will be reviewed at the next On-site meeting.
- Next meeting is On-site at Lawrence County EOC on 04/02/2014 @ 1100 A.M.

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 03/19/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Mike Rearick	MCM		
Allen Miller	Lawrence County Dps		

Lawrence County HMP
Meeting Agenda

March19, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Review capability forms and Hazard Profiles.
  - Extreme Temperatures
  - Landslides

Action Items

- Next meeting will be a conference call on 04/02/2014 @ 1100. This will be an Onsite meeting at Lawrence County EOC.

Lawrence County HMP
Planning Team Meeting
Minutes

April 2, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Present: Allen Miller, Lawrence Co. Planning, Brian Melcer, Lawrence County EMA

Introductions:

Introductions completed by all attendees.

Business:

- Ed Hoffman reviewed the draft project schedule and outlined how the update process will move forward.
- Discussed locations for Municipal Meetings. Proposed one in the New Castle and Ellwood City Area. These are scheduled for July.
- Identified New Hazards to profile including; Earthquake, Extreme Temperature, Invasive Species, Radon Exposure, Disorientation, Urban Fire and Explosion, Drowning, and Utility Interruptions.
- It was discussed that another On-site meeting will not be needed until the hazard profiles are drafted. This meeting will be on May 21, 2014 @ Lawrence County EOC at 1100 A.M.

Action Items

- Hazard Profiles and Capability Assesments will be reviewed at the next On-site meeting.
- Next meeting is will be on May 7th 2017 @ 0930 and will be a conference call. Invites will be sent.

SIGN IN SHEET
PROJECT: Lawrence County HMP
DATE: April 02, 2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Planning	724-654-1907	amiller@co.lawrence.pa.us
Brian Mellon	Public Safety	724 202-7101	BMELLEN@LEOL.NET

Lawrence County HMP
Meeting Agenda

April 2, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
  - Review and Complete Hazard Assessment worksheet for the County
  - Review Hazard profiles

Action Items

- Status of Capability assessment forms.

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 04/16/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Allen Miller	Lawrence County DPS		
Tina Marshall	Lawrence County Dps		

SIGN IN SHEET
PROJECT: HMP
DATE:05/21/2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Lawrence	724-658-1907	amiller@co.lawrence.pa.us
Debbie Henson	Lawrence Co DPS	724-202-7106	lcema@co.lawrence.pa.us
TINA MARSHALL	LCDPS	724-202-7105	tmarshall@co.lawrence.pa.us

Lawrence County HMP
Meeting Agenda

May 21, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
  - Assign Risk Factor using Assessment tool
  - Review Hazard profiles

Action Items

- Status of Capability assessment forms.
- Municipality Meetings
- Next meeting will be a conference call on June 2, 2014 @ 0930. 1-877-252-4049, passcode 6565

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 06/04/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Allen Miller	Lawrence County DPS		
Tina Marshall	Lawrence County Dps		
Debbie Henson	Lawrence County Dps		

SIGN IN SHEET
PROJECT: Lawrence County HMP
DATE:August 20, 2014

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	LawrenceCounty	724-656-1907	amiller@co.lawrence.pa.us
Debbie Henson	DPS	724-202-7106	lcema@co.lawrence.pa.us *Add
Tina Marshall	LCDPS	724-202-7105	tmarshall@co.lawrence.pa.us
STEPHEN SCHUSTER	ELLWOOD CITY SCHOOL	724 ~~333~~ 8743608	SSCHUSTER @ ELLWOOD.PA.US

Lawrence County HMP
Meeting Agenda

August 20, 2014 11:00 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
  - Develop Schedule for Municipal Meetings
  - Review Project Opportunity Project Form

Action Items

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- Municipality Meetings
- Next meeting will be a conference call on September 9, 2014 @ 0930. 1-877-252-4049, passcode 6565

SIGN IN SHEET

PROJECT: Lawrence County Municipal Meetings

DATE: 09/25-26/2014

NAME	COMPANY	CONTACT #	EMAIL
Washington Twp			
South New Castle			
New Beaver			
Volant Boro			
City of New Castle			
Enon Valley			

SIGN IN SHEET

PROJECT: Lawrence County Municipal Meetings

DATE: 09/25-26/2014

NAME	COMPANY	CONTACT #	EMAIL
Hickory Twp			
Enon			

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 10/15/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Allen Miller	Lawrence County DPS		

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 12/17/2014

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Allen Miller	Lawrence County DPS		

SIGN IN SHEET
PROJECT: Lawrence County Phone Conference
DATE: 01/29/2015

NAME	COMPANY	CONTACT #	EMAIL
Ed Hoffman	MCM		
Mike Rearick	MCM		
Debbie Henson	Lawrence County DPS		
Matt Staniszewski	City of New Castle		
Allen Miller	Lawrence County Dps		
Amy Mckinney	Lawrence County		

Lawrence County HMP
Meeting Agenda

January 29, 2014 09:30 A.M.

CALL TO ORDER: Ed Hoffman, MCM Consulting Group, Inc.

Introductions:

New Business:

- Review Project Schedule
- Lawrence County Planning Team Members
- Review draft of Section 2 Community Profile

Action Items

- Next meeting will be an onsite meeting, 02/05/2014 @ 1100 A.M.

Sort.

MCM Consulting Group, Inc.
Solutions for an unsafe world.

107 Kathy Ann Court
McMurray, PA 15317

Lawrence County
Hazard Mitigation Plan Update
Local Planning Team Meeting Minutes

July 22, 2015 10:00 A.M.

CALL TO ORDER: Michael Rearick, MCM Consulting Group, Inc.

PRESENT: Brian Melcer, Lawrence County DPS
Allen Miller, Lawrence County Planning
Robert Anderson, MCM Consulting Group

Business:

Project Schedule Review:

- Mike reviewed the updated project schedule.
- Brian will provide new dates for the public meeting for the draft mitigation plan.

Risk assessment section review:

- Risk Factor Assessment:
  - Mike reviewed the results of the assessment.
- Estimation of loss:
  - Flooding:
    - Mike discussed the results of the flooding estimation.
    - Mike also discussed the HAZUS analysis.
  - Wind storm/tornadoes:
    - Mike discussed what was needed to complete this estimation.
    - Brian and Allen stated that the chief assessor may have data to assist with this.
    - Allen, Mike and Bob will meet with the assessor prior to leaving.
- GIS data:
  - Mike requested access to the GIS data for Lawrence County.
  - MCM will be developing maps of vulnerability for each hazard.
  - Allen will place the data in a Dropbox folder and send the information to MCM.
- Landslides:
  - The group discussed landslides and previous occurrences.
  - Brian advised that there should be a couple incidents in Knowledge Center.
  - Brian stated there is a recent event in North Beaver Township.
  - MCM will follow up on the incidents.

412-580-7632 info@MCMConsultingGrp.com MCMConsultingGrp.com

Mitigation strategy section review:

- 2010-2015 accomplishments:
  - Allen and Brian provided a list of accomplishments in Lawrence County for the past 5 years in reference to hazard mitigation
- 2015 goals and objectives:
  - The group discussed the 2015 goals and objectives.
  - Adjustments were made to the list.
- 2015 mitigation actions:
  - The group reviewed and updated all the mitigation actions from the previous HMP.
  - Mike will update the list of actions and send the list back to the local planning team for a final review.
- 2015 municipal opportunity forms:
  - Mike provided a current list of mitigation opportunities from the municipalities.
  - Additional municipal opportunity forms will be placed in the spreadsheet.

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Public comment period:

- Determine date for public meeting:
  - Brian recommended completing the public meeting after a county commissioner meeting.
  - Brian will review upcoming dates and advise MCM.
  - Mike stated that the meeting would have to be conducted after August 13, 2015.
  - Brian stated that the meeting would occur towards the end of August or beginning of September.
- County advertising requirements:
  - Mike discussed the advertising requirements and proof of publications.
  - Mike also discussed the use of websites for information dissemination.
- Public comment period 30 days:
  - Mike discussed the public comment period and the process for submission of public comments.

Letters to municipalities and county EMA's:

- Mike suggested letters to the municipalities and the surrounding county EMA's to advise them when the updated plan is completed and available for review.

PEMA and FEMA review process:

- Mike discussed this process and the anticipated timeline.

General discussion:

- None.

Next meeting:

- The next planning team meeting will be conducted once the public meeting date is determined by Brian.

412-580-7632 info@MCMConsultingGrp.com MCMConsultingGrp.com

Action Items:

- MCM will develop meeting minutes for this meeting and an agenda for the next meeting.
- MCM will update the project schedule.
- MCM will update the mitigation goals, objectives and actions and return them to the local planning team for review.
- Lawrence County will determine a date to conduct the public meeting for the draft plan presentation and send the date to MCM.

SIGN IN SHEET

Lawrence County HMP Update

Local Planning Team Meeting

July 22, 2015

NAME	COMPANY	CONTACT #	EMAIL
Allen Miller	Planning	724-656-1907	amiller@co.lawrence.pa.us
Brian Melcer	Public Safety	724-202-7101	BMELCER@LEOC.NET
Robert Anderson	MCM	267-614-5485	RAnderson@MCMConsultingGrp.com
Mike [illegible]	MCM	814-229-8063	[illegible]@mcmconsultinggrp.com

APPENDIX D:
Municipal Flood Maps

Lawrence County Hazard Mitigation Plan

Bessemer Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

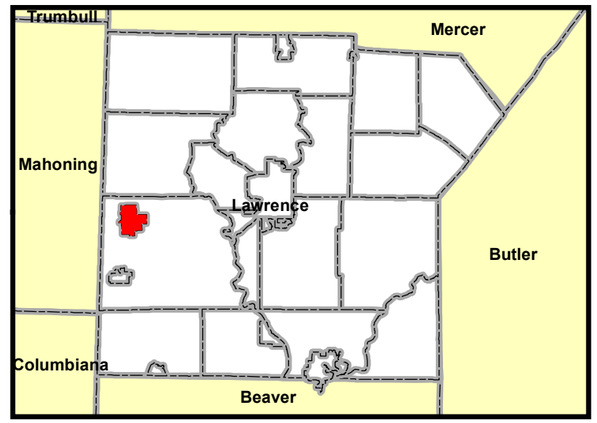
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 330 660 1,320 1,980 2,640 Feet



Lawrence County Hazard Mitigation Plan

Ellport Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

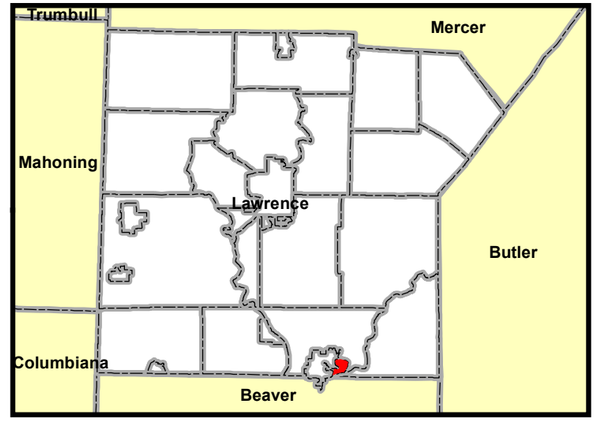
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 185 370 740 1,110 1,480 Feet



Lawrence County Hazard Mitigation Plan

Ellwood City Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

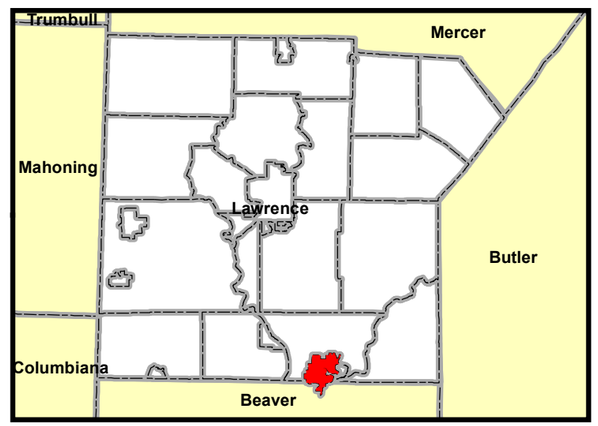
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

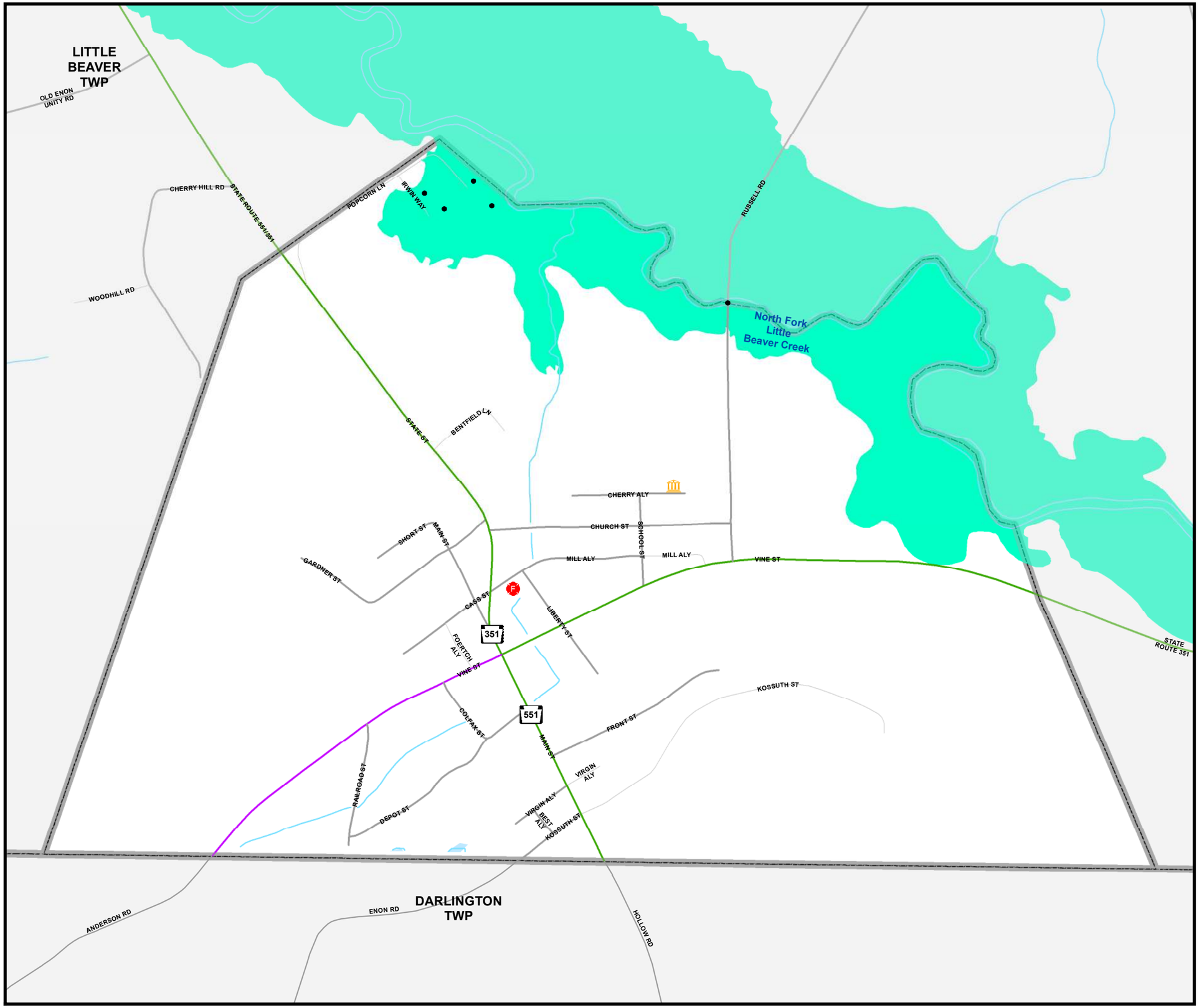
0 460 920 1,840 2,760 3,680 Feet



Lawrence County Hazard Mitigation Plan

Enon Valley Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015



Legend

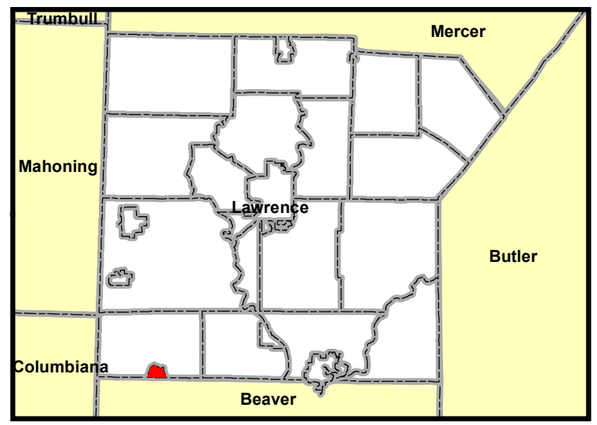
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 180 360 720 1,080 1,440 Feet



Lawrence County Hazard Mitigation Plan

Hickory Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

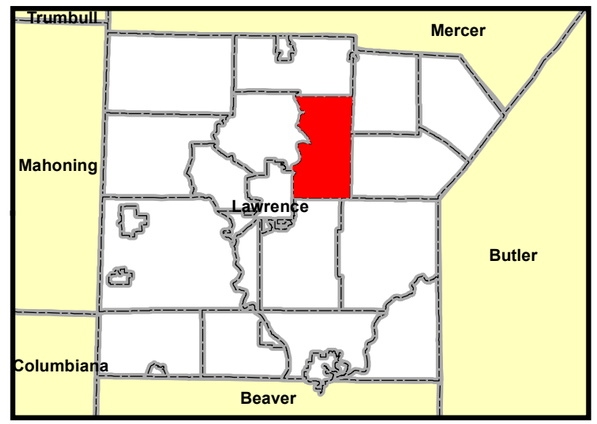
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,050 2,100 4,200 6,300 8,400 Feet



Lawrence County Hazard Mitigation Plan

Little Beaver Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

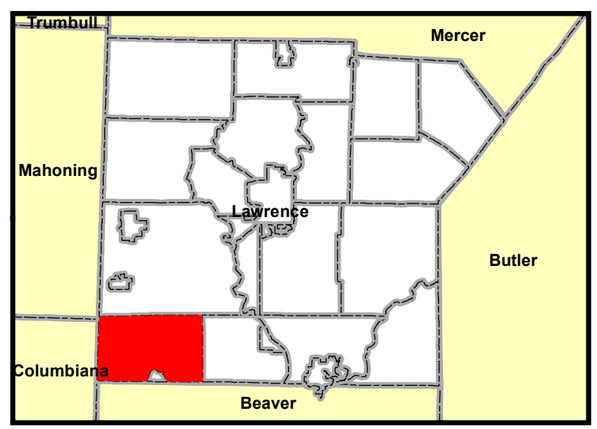
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 900 1,800 3,600 5,400 7,200 Feet



Lawrence County Hazard Mitigation Plan

Mahoning Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

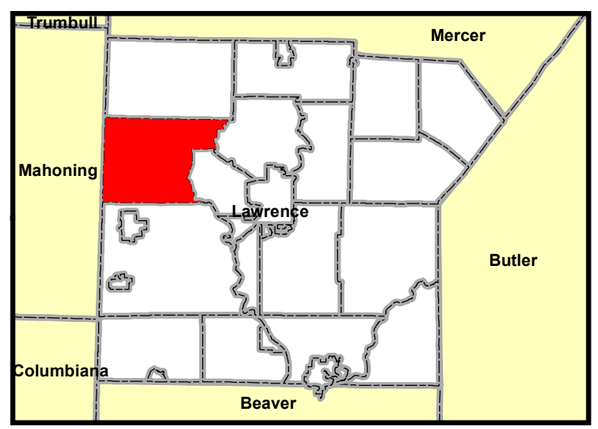
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,100 2,200 4,400 6,600 8,800 Feet



Lawrence County Hazard Mitigation Plan

Neshannock Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

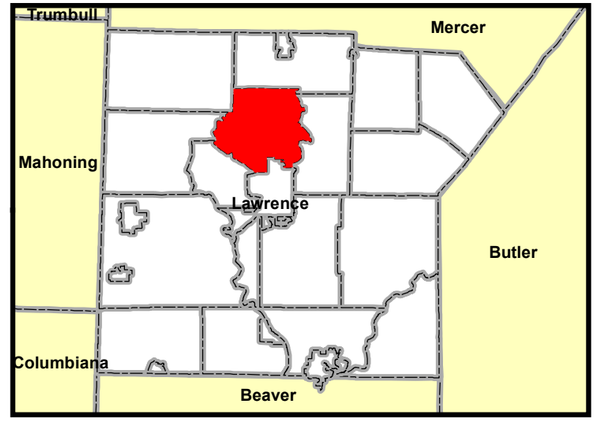
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 875 1,750 3,500 5,250 7,000 Feet



Lawrence County Hazard Mitigation Plan

New Beaver Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

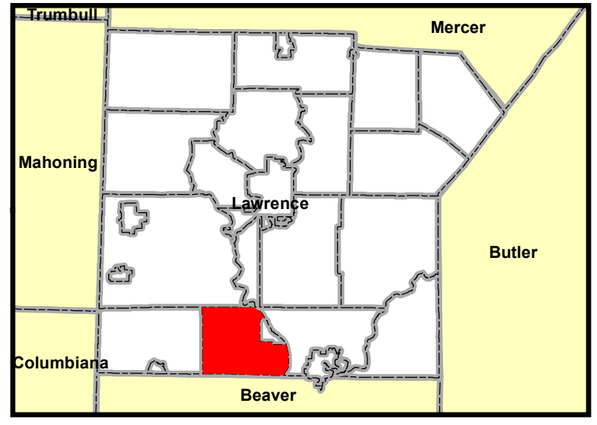
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 750 1,500 3,000 4,500 6,000 Feet



Lawrence County Hazard Mitigation Plan

New Castle City Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

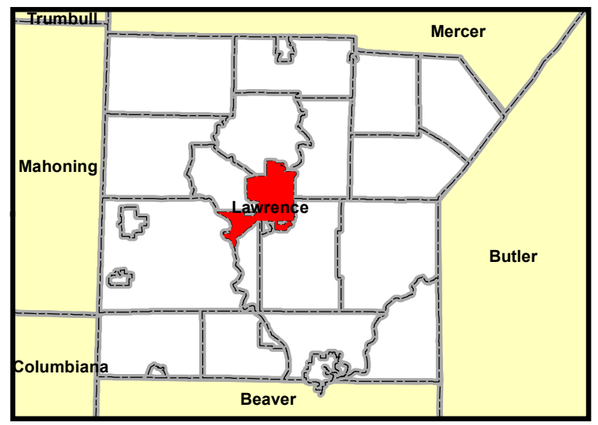
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 900 1,800 3,600 5,400 7,200 Feet



Lawrence County Hazard Mitigation Plan

New Wilmington Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

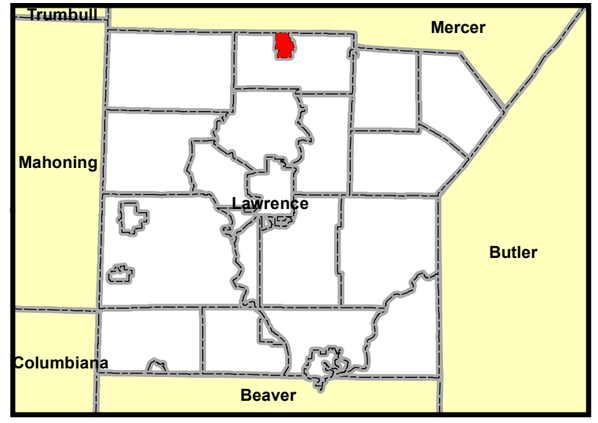
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 275 550 1,100 1,650 2,200 Feet



Lawrence County Hazard Mitigation Plan

North Beaver Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

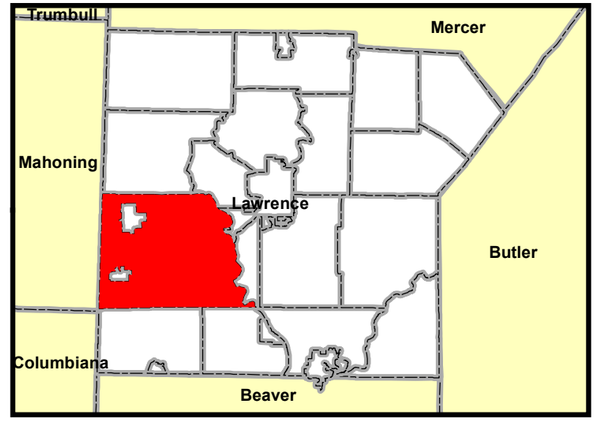
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,375 2,750 5,500 8,250 11,000 Feet



Lawrence County Hazard Mitigation Plan

Perry Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

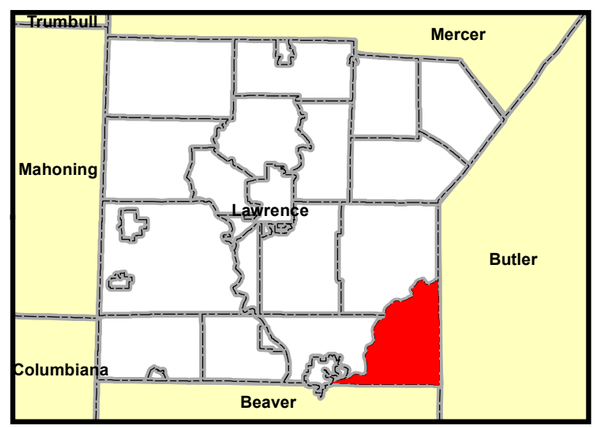
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,100 2,200 4,400 6,600 8,800 Feet



Lawrence County Hazard Mitigation Plan

Plain Grove Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

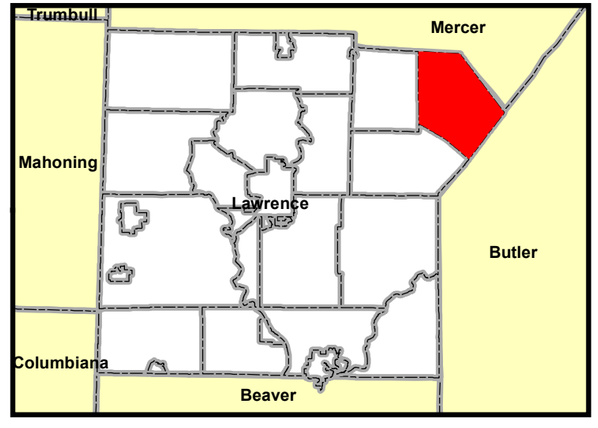
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,125 2,250 4,500 6,750 9,000 Feet



Lawrence County Hazard Mitigation Plan

Pulaski Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

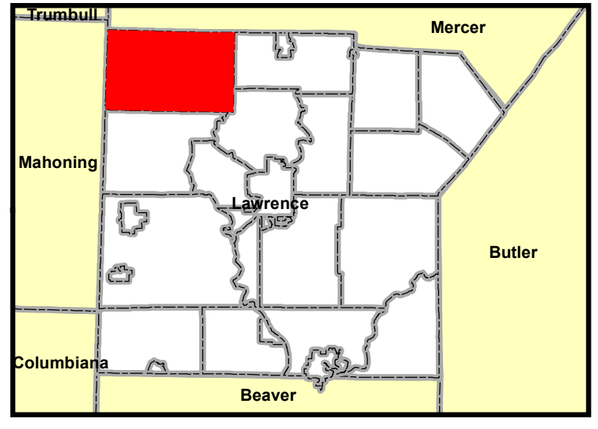
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,150 2,300 4,600 6,900 9,200 Feet



Lawrence County Hazard Mitigation Plan

Scott Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

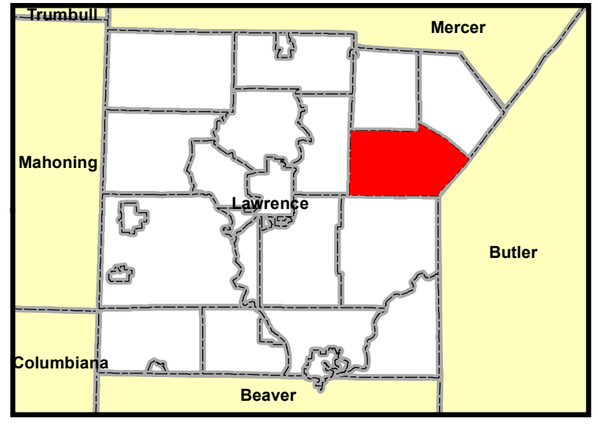
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,050 2,100 4,200 6,300 8,400 Feet



Lawrence County Hazard Mitigation Plan

Shenango Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

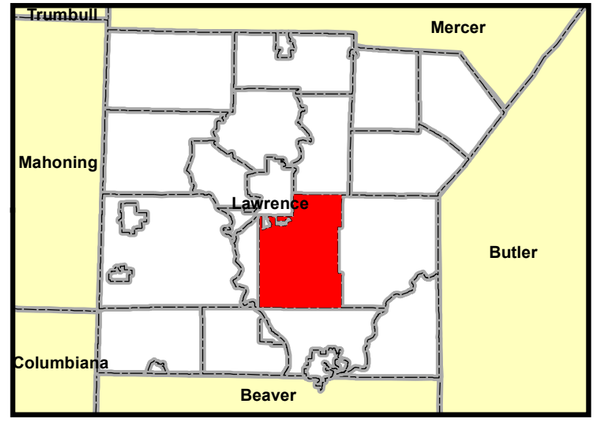
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,150 2,300 4,600 6,900 9,200 Feet



Lawrence County Hazard Mitigation Plan

Slippery Rock Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

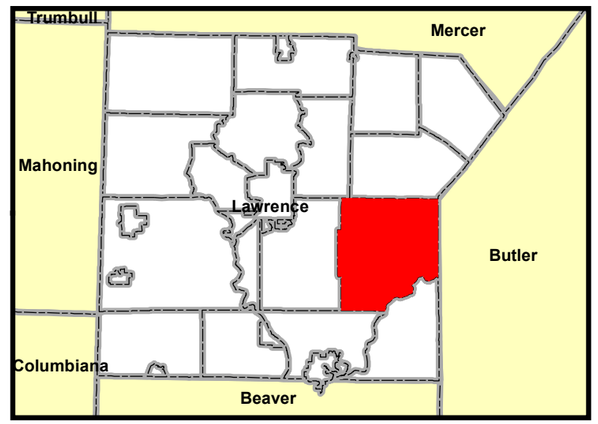
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N, W, E, S

0 1,150 2,300 4,600 6,900 9,200 Feet



NORTH
BEAVER TWP

MOUNT JACKSON RD

108

TROTTER RD

HERITAGE HILL RD

SLOVENE RD

FRATERNAL LN

MARTIN RD

LAKEVIEW CIR

LAKEVIEW CT

CABIN HILL LN

LAKEVIEW CIR

SPRING LN

MARTIN RD

MCCLAIN RD

DENTON LN

Lawrence County Hazard Mitigation Plan

Snpj Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

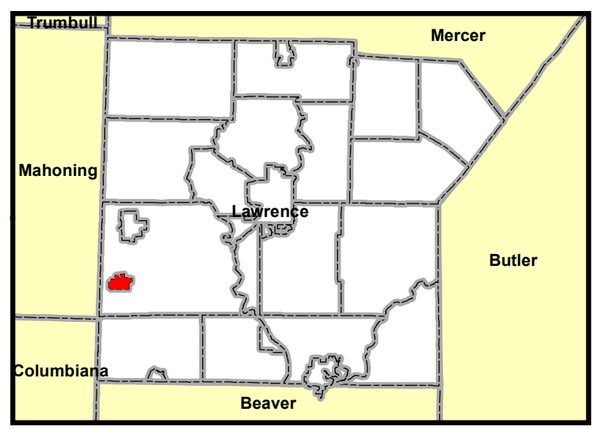
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N
W E
S

0 215 430 860 1,290 1,720 Feet



Lawrence County Hazard Mitigation Plan

South New Castle Bor Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

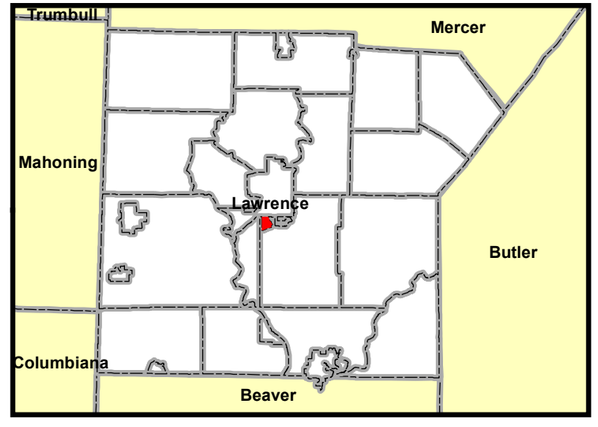
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 155 310 620 930 1,240 Feet



Lawrence County Hazard Mitigation Plan

Taylor Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

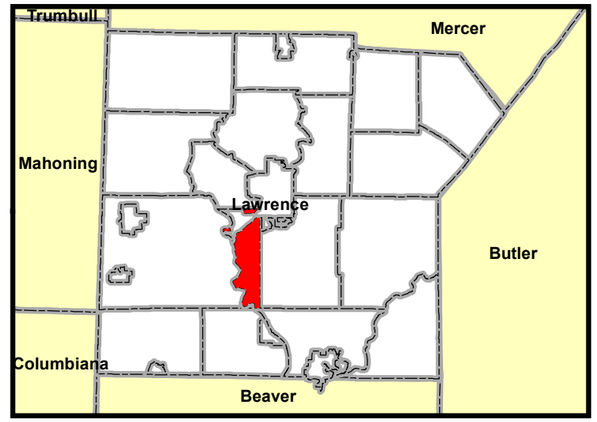
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,050 2,100 4,200 6,300 8,400 Feet



Lawrence County Hazard Mitigation Plan

Union Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

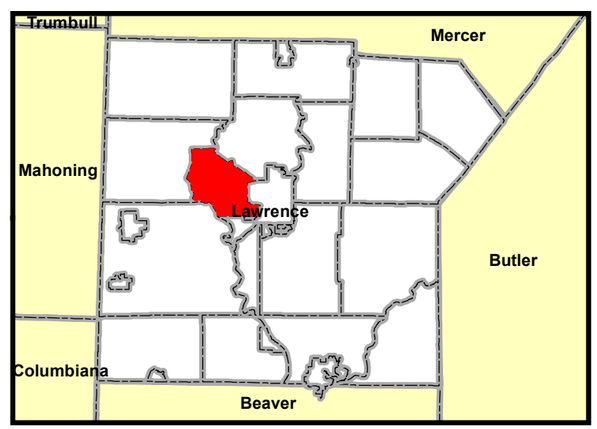
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N, W, E, S

0 700 1,400 2,800 4,200 5,600 Feet



Lawrence County Hazard Mitigation Plan

Volant Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

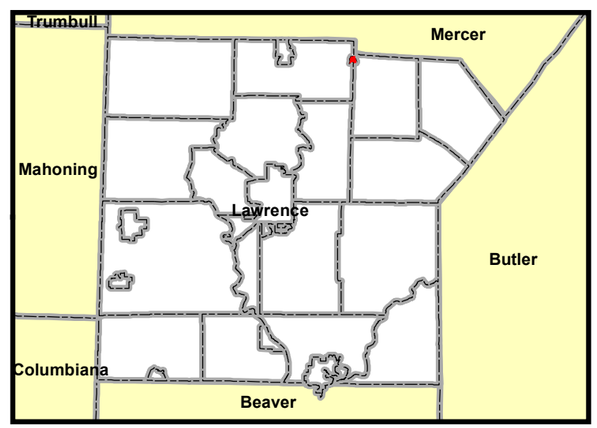
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N, W, E, S

0 90 180 360 540 720 Feet



Lawrence County Hazard Mitigation Plan

Wampum Boro Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

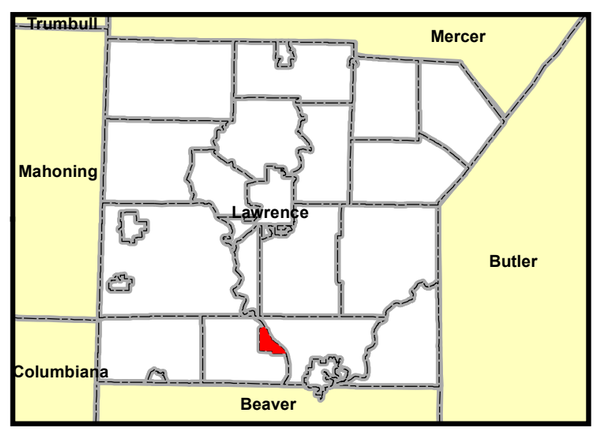
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 295 590 1,180 1,770 2,360 Feet



Lawrence County Hazard Mitigation Plan

Washington Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

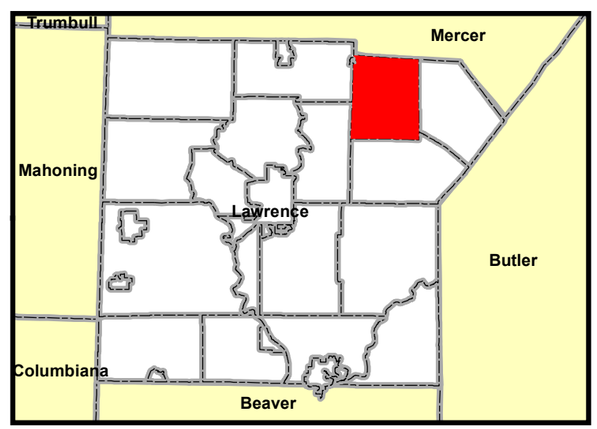
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 875 1,750 3,500 5,250 7,000 Feet



Lawrence County Hazard Mitigation Plan

Wayne Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

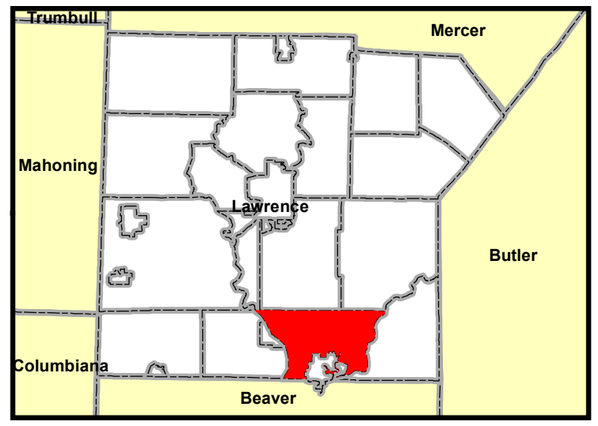
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,150 2,300 4,600 6,900 9,200 Feet



Lawrence County Hazard Mitigation Plan

Wilmington Twp Flood Vulnerability

Prepared by the
Lawrence County
Department of Planning & Community Development
March 2015

Legend

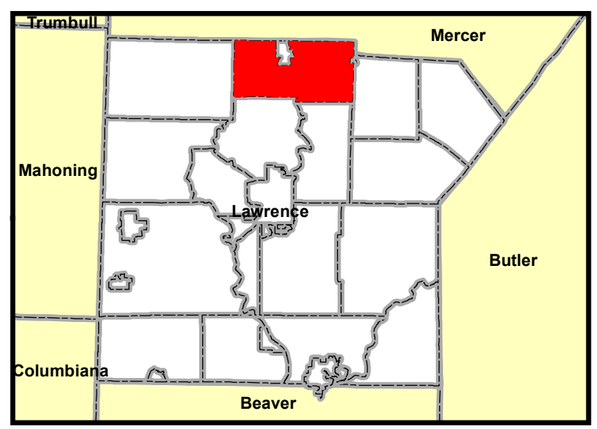
- Cell Towers
- Day Cares
- Government Facilities
- Nursing Homes
- SARA Facilities
- Schools
- Police Stations
- Hospitals
- Fire Stations
- EMS Facilities
- Structures
- Streams

Flood Hazard Areas

- A Zone
- AE Zone
- AE Zone with Floodway
- 0.2 % Annual Chance Flood Hazard

N W E S

0 1,050 2,100 4,200 6,300 8,400 Feet



APPENDIX E:
Critical and Special Needs Facilities

Lawrence County Critical Facilities

Name	Description	Jurisdiction	City
Bessemer Borough Police Dept	Law Enforcement (Police)	Lawrence, Bessemer Borough	Bessemer
Bessemer Borough VFD	Fire, Rescue, & Emergency Service	Lawrence, Bessemer Borough	Bessemer
Chewton VFD	Fire, Rescue, & Emergency Service	Lawrence, Wayne Township	Wampum
Ellwood City Fire Dept	Fire, Rescue, & Emergency Service	Lawrence, Ellwood City Borough	Ellwood City
Ellwood City Police Dept	Law Enforcement (Police)	Lawrence, Ellwood City Borough	Ellwood City
Enon Valley VFD	Fire, Rescue, & Emergency Service	Lawrence, Enon Valley Borough	Enon Valley
Hickory Twp Police Dept	Law Enforcement (Police)	Lawrence, Hickory Township	New Castle
Lawrence County DPS Warehouse/Storage Facility	Emergency Services - Other	Lawrence	New Castle
Lawrence County Primary EOC	Emergency Command & Control Center (EOC)	Lawrence	New Castle
Little Beaver Twp Police Dept	Law Enforcement (Police)	Lawrence, Little Beaver Township	Enon Valley
Medevac Ambulance Service - Ellwood Station	Emergency Medical Services (EMS)	Lawrence	Ellwood City
Medevac Ambulance Service - New Castle Station	Emergency Medical Services (EMS)	Lawrence	New Castle
Neshannock Township VFD	Emergency Command & Control Center (EOC)	Lawrence	New Castle
Neshannock Twp Police Dept	Law Enforcement (Police)	Lawrence, Neshannock Township	New Castle
Neshannock Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, Neshannock Township	New Castle
Neshannock Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, Neshannock Township	New Castle
New Beaver Borough VFD	Fire, Rescue, & Emergency Service	Lawrence, New Beaver Borough	Wampum
New Beaver Police Dept	Law Enforcement (Police)	Lawrence, New Beaver Borough	New Galilee Rd
New Castle Fire Dept- Central Station	Fire, Rescue, & Emergency Service	Lawrence, New Castle City	New Castle
New Castle Police Dept	Law Enforcement (Police)	Lawrence, New Castle City	New Castle
New Wilmington Borough Police Dept	Law Enforcement (Police)	Lawrence, New Wilmington Borough	New Wilmington
New Wilmington VFD	Fire, Rescue, & Emergency Service	Lawrence, New Wilmington Borough	New Wilmington
Noga Ambulance Service - Station 10	Emergency Medical Services (EMS)	Lawrence	New Castle
Noga Ambulance Service - Station 20	Emergency Medical Services (EMS)	Lawrence	New Castle

Lawrence County Critical Facilities

Name	Description	Jurisdiction	City
Noga Ambulance Service - Station 30	Emergency Medical Services (EMS)	Lawrence	Ellwood City
Noga Ambulance Service - Station 40	Emergency Medical Services (EMS)	Lawrence	New Castle
North Beaver Township Police Dept	Law Enforcement (Police)	Lawrence, North Beaver Township	New Castle
Pennsylvania State Police (PSP)	Law Enforcement (Police)	Lawrence	New Castle
Pulaski Twp Volunteer Ambulance Company	Emergency Medical Services (EMS)	Lawrence, Pulaski Township	New Bedford
Shenango Township Police Dept	Law Enforcement (Police)	Lawrence, Shenango Township	New Castle
Shenango Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, Shenango Township	New Castle
Shenango Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, Shenango Township	New Castle
Slippery Rock Twp VFD	Fire, Rescue, & Emergency Service	Lawrence, Slippery Rock Township	Pottersville
South New Castle Borough VFD	Fire, Rescue, & Emergency Service	Lawrence	New Castle
Taylor Twp VFD	Fire, Rescue, & Emergency Service	Lawrence	West Pittsburgh
Union Twp Police Dept	Law Enforcement (Police)	Lawrence, Union Township	New Castle
Union Twp VFD	Fire, Rescue, & Emergency Service	Lawrence, Union Township	New Castle
Wampum Borough VFD	Fire, Rescue, & Emergency Service	Lawrence, Wampum Borough	Wampum
Wampum Police Dept	Law Enforcement (Police)	Lawrence, Wampum Borough	Wampum
Wayne Twp Police Dept	Law Enforcement (Police)	Lawrence, Wayne Township	Ellwood City
Wayne Twp VFD	Fire, Rescue, & Emergency Service	Lawrence, Wayne Township	Ellwood City
Wurtemberg Perry VFD	Fire, Rescue, & Emergency Service	Lawrence, Perry Township	Ellwood City
Hickory Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, Hickory Township	New Castle
Mahoning Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, Mahoning Township	Edinburg
North Beaver Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, North Beaver Township	New Castle
Pulaski Twp VFD - Station 1	Fire, Rescue, & Emergency Service	Lawrence, Pulaski Township	New Bedford
Pulaski Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, Pulaski Township	Pulaski
Scott Twp VFD	Fire, Rescue, & Emergency Service	Lawrence, Scott Township	New Castle
Volant VFC	Fire, Rescue, & Emergency Service	Lawrence, Volant Borough	Volant

Lawrence County Critical Facilities

Name	Description	Jurisdiction	City
Mahoning Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, Mahoning Township	
Mahoning Twp VFD - Station 3	Fire, Rescue, & Emergency Service	Lawrence, Mahoning Township	
Hickory Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, Hickory Township	
New Castle City Fire Dept - Station 7	Fire, Rescue, & Emergency Service	Lawrence, New Castle City	
North Beaver Twp VFD - Station 2	Fire, Rescue, & Emergency Service	Lawrence, North Beaver Township	

APPENDIX F:
2010 Mitigation Project Opportunities

Community: Enon Valley Borough ***Action No:1***	***Action*** **Moving Telephone Company out of Enon Store on Main Street and Vine because of basement flooding.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Low
Estimated Cost	$60,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
09/25/2014	On-Going	The municipality requires grant funding to complete this project.

Community: Enon Valley Borough ***Action No:2***	***Action*** **Replace bridge culvert on Church Street.** Current culvert is too small and creates a damming effect that backs up water and damages the upstream culverts on the unnamed tributaries and causes basements flooding.
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$650,000
Potential Funding Sources:	CDBG & Federal Grants, Dept of Interior
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Open	Primary Concern to increase flow by increasing culvert diameter.
09/25/2014	On-Going	The municipality requires grant funding to complete this project.

Community: Enon Valley Borough ***Action No:3***	***Action*** **Roadside Storm Water Drainage.**
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Medium
Estimated Cost	Unknown
Potential Funding Sources:	CDBG, DCED, Local
Lead Agency/Department	Borough
Implementation Schedule	Perpetual

Progress Report

Review Date	***Status***	***Notes***
9/18/09	On-Going	25% Upgraded
09/25/2014	On-Going	Approximately 50% of this project has been completed. Grant funding would allow for the project to be completed more rapidly.

Community: Enon Valley Borough ***Action No:4***	***Action*** **Watershed Assessment**
Category	Natural Resource Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	Unknown - Various
Potential Funding Sources:	Various
Lead Agency/Department	Borough
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	On Going	20 – 25% Complete
09/25/2014	Completed	This project was completed in 2011 with the completion of the Lawrence County stormwater management plan by the county planning department. Enon Valley is located in the Beaver River Watershed Conservation Plan developed in 2008.

Community: Enon Valley Borough ***Action No:5***	***Action*** **Cleanout and Repair Existing Drainage System**
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Medium
Estimated Cost	Unknown
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	On-Going	As needed
09/25/2014	On-Going	This action is completed as necessary on an annual basis.

Community: Little Beaver Township ***Action No:1***	***Action*** **Remove the two 90 degree bends in the North Fork of the Little Beaver River below Scott Wallace Road.**
Category	Natural Resource Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	Unknown
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	The municipal elected officials are still attempting to secure funding to complete this project.

Community: City of New Castle ***Action No:1***		***Action*** **Replacement/rehabilitation of old sewer lines or installation of new sewer lines where none exists** • Carlisle Avenue; Court and Countyline Streets; Highland and Hazelcroft Avenues, Lutton Street; Mahoning Avenue, • Moravia Street; Scott Street; and Wilmington Avenue**.**
Category		Structural Projects
Hazard(s) Addressed		Flooding
Priority (High, Medium, Low)		High
Estimated Cost		$585,000
Potential Funding Sources:		Local sewer fees, CDBG, FMA
Lead Agency/Department		City of New Castle
Implementation Schedule		2015-2020
Progress Report		
Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014		

Community: City of New Castle ***Action No:2***	***Action*** **Installation of inlets and new discharge pipes to river:** East Washington Street and Croton Avenue; Mill Street
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$85,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding

Community: City of New Castle ***Action No:3***		***Action*** **Repair of sliding hillside that is collapsing storm sewer line that carries water from the northwest side of the city:** Boyles Avenue Extension
Category		Structural Projects
Hazard(s) Addressed		Flooding
Priority (High, Medium, Low)		High
Estimated Cost		$50,000
Potential Funding Sources:		
Lead Agency/Department		
Implementation Schedule		
Progress Report		
Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding

Community: City of New Castle ***Action No:4***	***Action*** **Installation of a new pump station to pump water to the river:** Lafayette and Liberty Streets
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$50,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report		
Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding

Community: City of New Castle ***Action No:5***	***Action*** **Fulkerson Street Bridge:** This bridge is in imminent danger of further collapse and is currently closed. The reconstruction of the bridge would cost approximately $168,000. There is only one home that necessitates the reconstruction of the bridge. The City of New Castle feels that it would be less costly to purchase the house as opposed to repairing the bridge.
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	Fulkerson Street Bridge: rebuild - $168,000, or purchase house at approximately $25,000 - $45,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding

Community: City of New Castle ***Action No:6***	***Action*** **Purchase of a salt storage shed:**This would give the City the ability to store larger amounts of salt.
Category	Structural Projects
Hazard(s) Addressed	Winter Weather
Priority (High, Medium, Low)	Low
Estimated Cost	$125,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding

Community: New Wilmington Borough ***Action No:1***	***Action*** **Waterline replacements.**
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Low
Estimated Cost	Unknown
Potential Funding Sources:	Fees
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	On-Going	
09/25/2014	On-Going	This project will continue until all waterlines are upgraded

Community: New Wilmington Borough ***Action No:2***	***Action*** **Treat Flooding at Sewage Treatment Facility.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$250,000 - $500,000
Potential Funding Sources:	FMA and HMGP
Lead Agency/Department	New Wilmington Borough
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project. Potential funding sources are FMA and HMGP

Community: Perry Township ***Action No:1***	***Action*** **Provide information on hurricane straps and other methods of protecting property from wind storms and tornadoes to business and homeowners.**
Category	Public Education and Awareness
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	<$1,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to completed the project.

Community: Pulaski Township ***Action No:1***	***Action*** **Dredge Deer Creek.**
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$25,000
Potential Funding Sources:	
Lead Agency/Department	Lawrence County Conservation District (Megan Gahring)
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	On-Going	Currently waiting for our joint permit from DEP. Construction is expected to begin Spring 2010 or after June 15, 2010 because of trout restrictions
09/25/2014	On-Going	The project was completed but will require maintenance.

Community: Pulaski Township ***Action No:2***	***Action*** **Elevate Nashua Road.**
Category	Structural Projects
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$1,000,000
Potential Funding Sources:	FMA or HMGP
Lead Agency/Department	Pulaski Township
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not-Started	Not Started due to lack of funding
09/25/2014	No Started	Grant funding is required to complete this project. Additional flooding has occurred in this area and the project remains a valid opportunity. Pulaski Township is the lead agency.

Community: Shenango Township ***Action No:1***	***Action*** **Flooding – Kerr and Mooney Trailer Parks:** Relocation of Residents**.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$300,000 – 500,000
Potential Funding Sources:	FMA or HSGP
Lead Agency/Department	Shenango Township
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Shenango Township ***Action No:2***	***Action*** **Flooding – Kerr and Mooney Trailer Parks:** Dike Construction**.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$200,000 - $300,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report		
Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Shenango Township ***Action No:3***	***Action*** **Flooding – Kerr and Mooney Trailer Parks:** Dredging of Streambed**.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	$350,000 - $700,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Shenango Township ***Action No:4***	***Action*** **Flooding – Daugherty Road:** Lengthening of Bridge/Raising Roadway**.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Medium
Estimated Cost	$750,000 - $1,500,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report		
Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Shenango Township ***Action No:5***	***Action*** **Flooding – Daugherty Road:** Dredging of Streambed**.**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Medium
Estimated Cost	$100,000 - $200,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Shenango Township ***Action No:6***	***Action*** **Widening of U.S. Route 422:**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	Low
Estimated Cost	$3,000,000 - $5,000,000
Potential Funding Sources:	TIP
Lead Agency/Department	PennDOT
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Joint effort with PennDOT. Grant funding is required to complete this project.

Community: Shenango Township ***Action No:7***	***Action*** **Purchase of EAS Radios:**
Category	Emergency Services
Hazard(s) Addressed	All
Priority (High, Medium, Low)	Low
Estimated Cost	$6,000.00 - $10,000
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to urgency to purchase and install.
09/25/2014	Not Started	Grant funding is required to complete this project.

Community: Wilmington Township ***Action No:1***	***Action*** **Both the Big and Little Neshannock Creeks need to be dredged or cleared of debris. The Little Neshannock Creek has not been touched since the late 50's and is especially in need of dredging.:**
Category	Property Protection
Hazard(s) Addressed	Flooding
Priority (High, Medium, Low)	High
Estimated Cost	Unknown
Potential Funding Sources:	
Lead Agency/Department	
Implementation Schedule	

Progress Report

Review Date	***Status***	***Notes***
9/18/09	Not Started	Not Started due to lack of funding
09/25/2014	Not Started	Grant funding is required to complete the project.

APPENDIX G:
2015 Mitigation Project Opportunities

2015 Lawrence County Hazard Mitigation Plan - Municipal Project Opportunities								
Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	Waterway Improvement 2014-00	The City is tranversed by multiple waterways within Lawrence County and a great portion of the City is currently deignated in the floodplain in the Neshannock Creek corridor	The City of New Castle would suggest as grant dollars are available thru PEMA, FEMA and other agencies that selective parcels be acquired for river waterway improvement	Flooding	$250,000	
City of New Castle	None	10/15/2014	Water Management Assessment 2014-00	Much of the City of New Castle becomes inundated with water due to the Neshannock Creek	The Army Corps of Engineers presented in prior years the use of an inflatable dam to be used to assist with flood control	Flooding	$1,000,000	
City of New Castle	None	11/5/2014	Water Management 2014-00	No stormwater inlets on Edgewood / Highland Avenue	The City of New Castle would suggest as grant dollars are available thru PEMA, FEMA and other agencies that selective parcels be acquired for capacity building	Flooding	$80,000.00	
City of New Castle	None	10/15/2014	Flood Zones 2014-01	The city is tranversed by multiple waterways within Lawrence County and a great portion of the City is currently deignated in the floodplain	The balance for floodplain protection and Economic Development must be reviewed. In looking at past flooding patterns, the City of New Castle would also suggest working with PEMA, FEMA and other agencies to re-evaluate our floodplain or work to reduce the amount of property in the floodplain.	Flooding	None	
City of New Castle	None	10/15/2014	Capcity Building 2014-02	The city is tranversed by multiple waterways within Lawrence County and a great portion of the City is currently deignated in the floodplain	The City of New Castle would suggest as grant dollars are available thru PEMA, FEMA, and other Agencies that selective parcels be acquired for capacity building	Flooding	None	
City of New Castle	None	10/15/2014	Economic Vitality 2014-03	The City of New Castle has many older commercial structures that prohibit the expansion or improvement of those strucutres to current CFR regulations	The City would look to partner with State agencies and/or Technical Assistance on a creative adaptive use plan for the city to ensure the economic vitality of the community while balancing water resources.	All Hazards	None	
City of New Castle	None	10/15/2014	Repetitive Loss Structures 2014-04	The City is traversed by multiple waterways within Lawrence County and a great portion of the city is	Repetitive loss structures should be eligible for buyout with assistance from The City staff for reuse options	Flooding	None	
City of New Castle	None	10/15/2014	Water Management 2014-05	Often times the link between flood water and storm water are inter-mixed	The City would look to state agencies for assistance on a holistic approach to water management. (again identify adaptive reuse option for properties while planning and addressing for stormwater, floodwater, and improving water quality)	Flooding	None	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	Water Management Assessment 2014-06	Much of the city of New Castle is paved, these alleys and roadways become inundated with water and act as a stream.	A culvert inventory and system check for capacity and maintenance issues needs performed. (Assistance from the state on funds to retain a firm to inspect all lines and identify Capital improvements again can be done with a Water Management Assessment or as part of the adaptive reuse)	Flooding	None	
City of New Castle	None	10/15/2014	General Industrial 2014-07	The City is home to many industrial sites and SARA facilities are on file. The concern of the city is we are a major arterial connect for other municipality and assistance at the state level for training of personnel for emergency preparedness should be looked at. Often times we are unsure of the freight being carried thru residential and historic neighborhoods.	Health, safety and welfare items should be addressed. A procedure for contamination needs developed.	Environmental Hazards	None	
City of New Castle	None	10/15/2014	Industrial Environmental Cleanup 2014-08	Shenango China, Properties along Industrial Street and other parcels zoned as industrial and/or	Remediation of environmental issues at several industrial sites.	Environmental Hazards	None	
City of New Castle	None	10/15/2014	Flooding Moravia Street 2014-09	Drainage project at Moravia St by the EQS entrance which has	Install inlets and other stormwater management devices	Flooding	$150,000.00	
City of New Castle	None	10/15/2014	Flooding Mill Street 2014-10	Significant flooding along Mill Street due to inadequate infrastructure.	Install relief line requiring 680 LF of pipe and 120 LF of bore, casing and pipe under the railroad. Before any money is spent, we need to get a camera and flusher truck there to make sure we don't have any clogs or collapses in the existing storm sewer.	Flooding	$600,000.00	
City of New Castle	None	10/15/2014	Flooding Days Inn 20014-11	Property is directly next to river and subject to significant flooding.	Infrastructure and flooding mitigation measures to return property to meaningful use.	Flooding	None	
City of New Castle	None	10/15/2014	Flooding Corton Avenue and Neshannock Blvd 2014-12	Significant flooding along Croton Avenue and Neshanock Blvd due to inadequate infrastructure.	Inlets, infrastructure and flooding mitigation measures.	Flooding	None	
City of New Castle	None	10/15/2014	Cascade Park 2014-13	Several roads and/or bridges are failing limiting access to recreation by residents and visitors as well as endangering public safety.	Pool Access Road Bridge over Big Run----$520,000.00 Big Run No. 1 (at the southern entrance to the park)----$425,000.00 Big Run No. 2 foundation repair----$150,000.00 To remove the Boyles Ave Bridge over Rural Ave would be approximately $120,000.00	All Hazards	$1,215,000.00	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	Collapsed Roads 2014-14	Several streets/bridges have collapsed or are on the verge of collapsing or washing away.	Cascade Park Bridge Paper Mill Bridge Paper Mill Road (washes away) Industrial Street – Large trucks carrying hazardous materials and chemicals also use this road. Because of the extreme poor condition of the road, a threat of an accident or a truck turning over is eminent without repaving the entire street using Penndot standards --- $600,000.00	All Hazards	$2,500,000.00	
City of New Castle	None	10/15/2014	Building Collapse 2014-15	Various buildings in the city are beyond repair and are on the verge	Buildings include, but not limited to, Jefferson Court, New Fifties Diner,	Building Collapse	None	
City of New Castle	None	10/15/2014	FEMA DR4149 Long Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 805 square yards of Long Avenue was repaired with funding from FEMA/PEMA. However, potentially up to 8,790 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$176,220.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Hamilton Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurfa	FEMA/PEMA removed Hamilton Street from the final scope of work. However, potentially up to 344 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$75,000.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Carl Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 84 square yards of Carl Street was repaired with funding from FEMA/PEMA. However, potentially up to 1,984 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$44,720.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Lutton Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 547.56 square yards of Lutton Street was repaired with funding from FEMA/PEMA. However, potentially up to 11,451 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$228,120.00	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	FEMA DR4149 Dewey Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed Dewey Avenue from the final scope of work. However, potentially up to 11,426 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$70,700.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Uber Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 608 square yards of Uber Street was repaired with funding from FEMA/PEMA. However, potentially up to 1,480 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$34,640	
City of New Castle	None	10/15/2014	FEMA DR4149 Mill Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed Mill Street from the final scope of work. However, potentially up to 2,700 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$75,600.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Butler Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, inlets and pipes may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$12,000	
City of New Castle	None	10/15/2014	FEMA DR4149 Taylor Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, potentially up to 1,213 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$28,800	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	FEMA DR4149 Cunningham Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, potentially up to 1,097 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$25,752	
City of New Castle	None	10/15/2014	FEMA DR4149 Reynolds Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, potentially up to 1,345 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$31,222.00	
City of New Castle	None	10/15/2014	FEMA DR4149 Brooklyn Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 378.67 square yards of Brooklyn Avenue was repaired with funding from FEMA/PEMA. However, potentially up to 2,033 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$44,608	
City of New Castle	None	10/15/2014	FEMA DR4149 Pearson Mill Road	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	Approximately 333 square yards of Pearson Mill Road was repaired with funding from FEMA/PEMA. However, potentially up to 2,880 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come. It should also be noted, this street consists of gravel and part of the road has washed away due to the disaster.	Flooding	$34,800	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	FEMA DR4149 Lynn Street	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, potentially up to 1,986 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$42,750	
City of New Castle	None	10/15/2014	FEMA DR4149 Clarence Avenue	As part of the Presidentially declared disaster (FEMA DR-4149) on 10 July 2013, various streets and infrastructure suffered damage. Some of which, more visible, was repaired through assistance from FEMA/PEMA. Meanwhile, the long term impact and subsurface of some of the infrastructure/roads may not be immediately realized as a result of storm damage not visible.	FEMA/PEMA removed said street from the final scope of work. However, potentially up to 2,953 square yards may have been impacted and funding is needed to ensure the entire street is repaired and structurally sound for years to come.	Flooding	$62,160	
City of New Castle	None	10/15/2014	Towne Mall 2014-31	Large parcel with several businesses is located directly in the floodplain.	Stormwater Redevelopment / Planning / Engineering / Other Development	Flooding	$1,200,000	
City of New Castle	None	10/15/2014	Inner Beltway 2014-32	Entire main roadway artery / connector of several state routes fall within the floodplain. In the event of flooding, it would severely impact emergency personnel's ability to response to disasters.	Redevelopment of entire roadway and bridge system. Redesign work. Property Acquisition	Flooding	$3,200,000	
City of New Castle	None	10/15/2014	Paper Mill 2014-33	Only dirt and gravel road in the City. Negatively affects storm water runoff. Poses significant threat to public safety as the road is impassable in certain sections even for emergency vehicles. Opportunity for economic development as the road could serve to connect several of the city's natural resources / assets.	Design and reconstruction entire road, bridges, install appropriate infrastructure and storm water management devices.	Flooding	$5,000,000	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
City of New Castle	None	10/15/2014	Shenango China 2014-34	Large, blighted industrial parcels with possible environmental concerns. The structure caught on fire in the past and is a public safety concern. Adjacent parcels are also either vacant, blighted or currently have public housing projects that are high in crime.	Design mixed-used business park and market rate park. Property acquisition, clean environmental issues, demolish, construct Class A office buildings, adequate parking, flood control devices, storm water management, market rate town houses / condos / ranch homes. Install traffic signal and pedestrian and bicycle friendly crossings.	Flooding	$250,000,000.00	
City of New Castle	None	10/15/2014	Graceland Road 2014-35	Sanitary, flooding and storm water issues from Norwood to Neshannock line.	Infrastructure Installation	Flooding	$150,000.00	
City of New Castle	None	10/15/2014	Fort Bridge Walkway 2014-36	Bridge was removed and now creates an access barrier for residents to other parts of the city.	Installation of an ADA walkway.	All Hazards	$150,000.00	
City of New Castle	None	10/15/2014	Locus Street Bridge 2014-37	Bridge is in deplorable conditions and may collapse.	Replace the bridge	All Hazards	$400,000.00	
City of New Castle	None	10/15/2014	Laffayette Street 2014-38	Significant flooding issues from Lacock to High streets.	Water pump and infrastruction	Flooding	$1,000,000	
City of New Castle	None	10/15/2014	Lyndal Street 2014-39	Two sections are collapse and others could fall into the water	Repair sections of Lyndal	Flooding	$150,000	
City of New Castle	None	10/15/2014	Industrial Street 2014-40	Main corridor for an area zoned heavy industrial. Road is in	Reconstruct the entire street per Penndot standards.	All Hazards	$500,000	
Neshannock Township	2	10/15/2014	Clover Lane Stone Wall	Repair undermining of the stone wall	Undermining of the stone wall along clover lane due to unnamed tributary to Shenango River	Flooding	$30,000	
Perry Township	1	10/16/2014	Major Culvert Replacement	Remove existing culvert, replace culvert with new galvanized pipe, cement end wall on east side of pipe, placement of large rip rap on west side of pipe reaching down to stream to secure area and stop undermining of pipe from water flow approximately 4"x60' dimensions	Four foot culvert eroding out due to water flow from hill - culvert to be replaced with new culvert and end walls for entrance and discharge sides	Flooding	$35,000.00	
Pulaski Township	1	10/17/2014	Nashoa Road	Raise roadway and install drainage culverts for 1/4-1/2 mile.	Roadway floods 6 times per year. More with bad rain. Floods after the Shenango Dams are opened.	Flooding	None	
Union Township	None	10/10/2014	Covert Road Berm Safety	Engineering to develop plan to anchor the guard rails along this potentially dangerous area. The township could then purchase and install the guardrail in this area, thus preventing vehicle accidents	Guardrails are not sturdy and require upgrades	Traffic Accidents	$5,000.00	
Union Township	None	10/10/2014	West Washington Bridge Repair	Engineering to develop a plan to fix berms, purchase and install new guardrails and make repairs to hillside	Decrease erosion and increase safety of guardrail	Flooding	$14,000.00	
Wayne Township	None	10/22/2014	Smiley Street	Dredge 200' downstreem from the end of the existing storm pipe	Mitigate residential flooding at north end of Smiley Street	Flooding	$100,000	

Municipality	Community Rank	Date	Project Name	Mitigation Measures		Hazard Mitigated	Total Cost	Review Status
				Project Description	Description of Problem to be Solved			
Wayne Township	None	10/17/2014	Greenhouse Road	Upstream dredging and installation of a new pre-cast culvert 20 ' long and 18' wide.	Mitigate roadway flooding on Greenhouse Road and adjacent Vinegar Valley Road	Flooding	$250,000	

APPENDIX H:
2015 HAZUS Report

Hazus-MH: Flood Event Report

Region Name: Lawrence_All

Flood Scenario: Lawrence_20150827_001

Print Date: Thursday, August 27, 2015

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 363 square miles and contains 3,968 census blocks. The region contains over 37 thousand households and has a total population of 91,108 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 39,907 buildings in the region with a total building replacement value (excluding contents) of 9,177 million dollars (2010 dollars). Approximately 93.03% of the buildings (and 71.98% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 39,907 buildings in the region which have an aggregate total replacement value of 9,177 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,605,487	72.0%
Commercial	1,398,112	15.2%
Industrial	575,334	6.3%
Agricultural	26,525	0.3%
Religion	200,693	2.2%
Government	109,152	1.2%
Education	261,576	2.9%
Total	**9,176,879**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,584,080	63.1%
Commercial	511,999	20.4%
Industrial	301,515	12.0%
Agricultural	9,049	0.4%
Religion	63,308	2.5%
Government	29,938	1.2%
Education	11,724	0.5%
Total	**2,511,613**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 482 beds.
There are 42 schools, 17 fire stations, 18 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Lawrence_All
Scenario Name:	Lawrence_20150827_001
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 250 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the scenario. There are an estimated 106 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	15	88.24	2	11.76	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	3	60.00	2	40.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	1	7.69	4	30.77	6	46.15	2	15.38	0	0.00
Religion	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	4	1.84	10	4.61	36	16.59	61	28.11	106	48.85
Total	**3**		**23**		**16**		**42**		**63**		**106**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	1	50.00	1	50.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	7	100.00
Masonry	1	1.82	4	7.27	2	3.64	9	16.36	16	29.09	23	41.82
Steel	2	9.52	11	52.38	2	9.52	4	19.05	2	9.52	0	0.00
Wood	0	0.00	6	3.66	9	5.49	28	17.07	45	27.44	76	46.34

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 482 hospital beds available for use. On the day of the scenario flood event, the model estimates that 482 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	17	1	0	1
Hospitals	3	0	0	0
Police Stations	18	1	0	1
Schools	42	2	0	2

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

Analysis has not been performed for this Scenario.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,057 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,329 people (out of a total population of 91,108) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 469.95 million dollars, which represents 18.71 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 468.24 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.15% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	70.23	50.58	42.37	4.88	168.05
	Content	38.53	119.88	104.06	19.48	281.94
	Inventory	0.00	1.74	16.37	0.15	18.25
	Subtotal	**108.75**	**172.19**	**162.79**	**24.51**	**468.24**
Business Interruption						
	Income	0.00	0.56	0.01	0.03	0.59
	Relocation	0.02	0.13	0.01	0.02	0.17
	Rental Income	0.01	0.08	0.00	0.00	0.09
	Wage	0.00	0.45	0.01	0.40	0.85
	Subtotal	**0.03**	**1.21**	**0.03**	**0.45**	**1.71**
ALL	**Total**	**108.79**	**173.40**	**162.81**	**24.95**	**469.95**

Appendix A: County Listing for the Region

Pennsylvania

- Lawrence

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Pennsylvania				
Lawrence	91,108	6,605,487	2,571,392	9,176,879
Total	**91,108**	**6,605,487**	**2,571,392**	**9,176,879**
Total Study Region	**91,108**	**6,605,487**	**2,571,392**	**9,176,879**

APPENDIX I:
2015 PASTEEL Analysis

EVALUATION CRITERIA FOR MITIGATION ACTIONS

The following discussion explains each of the PASTEEL evaluation criteria. It includes examples of questions the planning team should consider, as well as who may be the appropriate person or agency to answer these questions as the team works through the list of alternative mitigation actions.

POLITICAL. Understanding how your current community and state political leadership feels about issues related to the environment, economic development, safety, and emergency management will provide valuable insight into the level of political support you will have for mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability. This can be avoided by determining:

Evaluation Criteria	Yes?	No?
Is there **political support** to implement and maintain this action?	Plus	Minus
Is there a **local champion** willing to help see the action to completion?	Plus	Minus
Is there enough **public support** to ensure the success of the action?	Plus	Minus

ADMINISTRATIVE. Under this part of the evaluation criteria, you will examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine if the jurisdiction has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.

Evaluation Criteria	Yes?	No?
Does the jurisdiction have the **staff** available to implement the action, or can it be readily obtained?	Plus	Minus
Does the jurisdiction have the **funding** available to implement the action, or can it be readily obtained?	Plus	Minus
Can the community provide the necessary maintenance?	Plus	Minus

SOCIAL. The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of community acceptance by asking the following questions.

Evaluation Criteria	Yes?	No?
Will the **community accept** this action as appropriate and necessary?	Plus	Minus
Will the proposed action **adversely affect** one segment of the population?	Minus	Plus

TECHNICAL. It is important to determine if the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Here, you will determine whether the alternative action is a whole or partial solution, or not a solution at all, by considering the following types of issues:

Evaluation Criteria	Yes?	No?
Is the proposed action **technically feasible**?	Plus	Minus
How effective is the action in avoiding or reducing future losses? (I.e., is it a **long-term solution**?)	Plus	Minus
Will it create more problems than it solves? (I.e., will there be any **secondary impacts**?)	Minus	Plus

ECONOMIC. Every local government experiences budget constraints at one time or another. Cost-effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. Communities with tight budgets

or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources.

"Big ticket" mitigation actions, such as large-scale acquisition and relocation, are often considered for implementation in a post-disaster scenario when additional federal and state funding for mitigation is available. Economic considerations must include the present economic base and projected growth and should be based on answers to questions such as:

Evaluation Criteria	Yes?	No?
What **benefits** will the action provide?	Plus	Minus
Is the **cost** manageable given the community's fiscal restraints?	Plus	Minus
Does the action **contribute to other community economic goals**, such as capital improvements or economic development?	Plus	Minus
Is **outside funding** required to implement the action?	Minus	Plus

ENVIRONMENTAL. Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as the National Environmental Policy Act (NEPA), to keep in mind when using federal funds. You will need to evaluate whether the mitigation actions will result in negative consequences to environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.

Evaluation Criteria	Positive?	Negative?
How will this action affect the **land and water** resources?	Plus	Minus
How will this action affect **endangered species**?	Plus	Minus

How will this action affect **HAZMAT/Waste** sites?	Plus	Minus
	Yes?	**No?**
Is the action consistent with **community environmental goals**?	Plus	Minus
Will this action comply with **federal environmental laws** or regulations?	Minus	Plus

Numerous mitigation actions may well have beneficial impacts on the environment. For instance, acquisition and relocation of structures out of the floodplain, sediment and erosion control actions, and stream corridor and wetland restoration projects all help restore the natural function of the floodplain. Also, vegetation management in areas susceptible to wildfires can greatly reduce the potential for large wildfires that would be damaging to the community and the environment. Such mitigation actions benefit the environment while creating sustainable communities that are more resilient to disasters.

LEGAL. Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, you will determine whether your jurisdiction has the legal authority to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. Responsibility for land use planning and regulating development is exercised through the authority granted to municipal officials by the Pennsylvania Municipalities planning Code (MPC). Powers to enact construction, property maintenance and fire prevention codes are derived from the individual municipal codes, i.e. township (first and second class), borough or city code or home rule charter.

Legal authority is likely to have a significant role later in the process when your community will have to determine how mitigation activities can best be carried out, and to what extent mitigation policies and programs can be enforced.

PA STEEL Criteria

Evaluation Criteria	Yes?	No?
Does the **state** have the authority to implement the proposed action?	Plus	Minus
Are the proper laws, ordinances, and resolutions in place to implement the action? (I.e., is there **existing local authority**?)	Plus	Minus
Are there any potential legal consequences? Is the action likely to be **challenged** by stakeholders who may be negatively affected?	Minus	Plus

PA STEEL Evaluation - 2015 Lawrence County Hazard Mitigation Plan

Mitigation Actions		P			A				S			T		E		E					L		Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative				Social			Technical		Economic		Environmental					Legal						
Action No.	**Action**	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	**Total Plus**	**Total Minus**	**Total Plus**	**Total Minus**
1.1.1	Lawrence County and the municipalities will keep development away from vacant parcels in the floodplain	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	21	2	25	2
1.1.2	Lawrence County to arrange with PEMA/FEMA/DCED to hold training sessions with County and Municipalities on the NFIP requirements	+	+	+	+	-	+	+	+	+	+	+	+	+	-	+	+	N	N	+	+	+	+	+	19	2	23	2
1.2.1	Clear and separate sewer systems and storm drains to alleviate flooding in the county	+	+	+	+	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	N	+	+	19	3	21	5
1.3.1	Designated Coordination Centers will be created in each township and borough, and be supplied with Generators, Water, Food, & Supplies for post disaster recovery efforts.	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	21	1	25	1
1.3.2	Municipalities will develop evacuation plans for municipal buildings and sporting events.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	+	N	+	N	+	+	15	4	17	6
1.3.3	The county will continue to develop and maintain the Pandemic Emergency Plan for all municipalities	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	N	N	+	+	+	+	15	4	17	6
1.3.4	Lawrence County will collect and analyze dam inundation maps to determine which communities are at risk of a dam failure.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	N	N	+	+	+	+	15	4	17	6

Mitigation Actions		P			A			S				T			E	E					L			Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative			Social			Technical			Economic		Environmental					Legal							
Action No.	Action	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	Total Plus	Total Minus	Total Plus	Total Minus
1.3.5	Lawrence County will recommend ways to integrate the hazard mitigation plan with other municipal plans	+	+	+	-	-	-	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	19	4	22	4
1.4.1	Lawrence County to determine Agencies involved, databases needed, and investigate resources for a Fusion Center (Currently in Process through Region 13)	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	18	5	20	7
1.5.1	Develop a strategy to complete regionalization of emergency management services	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	-	16	3	20	3
1.5.2	Develop a strategy to complete regionalization of fire services	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	-	16	3	20	3
1.5.3	Develop a strategy to complete regionalization of law enforcement	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	-	17	2	21	2
1.5.4	Develop a strategy to complete regionalization of emergency medical services	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	-	16	3	20	3
2.1.1	Use GIS to develop addresses for structures in flood plains and send educational brochures.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	+	N	+	+	+	+	16	4	18	6
2.2.1	Acquire Funding for Public Warning System & Sirens for all critical facilities, municipalities, and educate households within the County.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	N	+	+	18	4	20	6

2.2.2	Install early warning Flood gages upstream to notify emergency services.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	N	+	+	18	4	20	6

Mitigation Actions		P			A					S			T			E		E					L	Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative					Social			Technical			Economic		Environmental					Legal					
Action No.	Action	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	Total Plus	Total Minus	Total Plus	Total Minus
2.3.1	Create a council with local utility providers and county planners to locate aging infrastructure of utilities	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	17	5	19	7
2.3.2	Replace/Rehab aging sewer lines or install lines where none exist	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.3.3	Replace aging Water lines	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.3.4	Cut trees away from Power lines	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	+	N	+	N	+	+	15	5	17	7
2.3.5	Develop a database in existing GIS system of all utility networks, noting age and condition of infrastructure.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	+	N	+	+	+	+	16	4	18	6
2.4.1	Acquisition or relocation of properties located in flood prone areas	+	+	+	-	-	-	+	+	+	+	+	+	-	+	+	+	N	N	N	+	N	+	+	15	4	17	6
2.4.2	Construct flood walls to decrease the risk to flooding	+	+	+	N	-	-	+	+	+	+	+	+	-	+	-	N	N	+	N	+	N	+	+	14	4	16	6
2.5.1	Dredge waterways to decrease flooding	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.5.2	Conduct stream bank and stream bed restoration to decrease flooding	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.5.3	Complete and maintain watershed conservation plans	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7

Mitigation Actions		P			A			S			T			E		E				L			Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative			Social			Technical			Economic		Environmental				Legal						
Action No.	Action	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	Total Plus	Total Minus	Total Plus	Total Minus
2.6.1	Increase the access points to various bodies of water to increase emergency services response and recovery capabilities	+	+	+	-	-	-	+	+	+	+	+	+	-	+	+	+	-	+	+	+	+	+	+	18	5	19	7
2.6.2	Install, maintain and repair fire hydrants in local municipalities	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.6.3	Improve the emergency communication systems so they can withstand all hazards identified in the mitigation plan	+	+	-	-	-	+	+	+	+	+	+	+	-	+	+	N	N	N	N	+	+	+	+	15	4	17	6
2.6.4	Increase emergency planning capabilities as it pertains to missing persons and search and rescue in recreation areas	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	18	1	22	1
2.7.1	Encourage adoption and enforcement of the Uniform Construction Code.	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
2.7.2	Continue roadside storm water drainage upgrades	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	14	5	16	7
3.1.1	Develop a database in existing GIS system of all natural resource areas including maps to be used in future mitigation activities.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	+	N	+	+	+	+	16	4	18	6
3.1.2	Collect more information on critical facilities so that future mitigation plan updates can distinguish vulnerability on building characteristics.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	N	N	+	N	+	+	+	+	16	4	18	6
3.1.3	Improve municipal project status updating process	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	17	2	21	2

Mitigation Actions		P			A					S			T		E		E					L	Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative					Social			Technical		Economic		Environmental					Legal					
Action No.	Action	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	Total Plus	Total Minus	Total Plus	Total Minus
4.2.1	Provide the local Public Libraries and public websites with all available resources, as well as a number of FEMA publications, and a final copy of the Lawrence County Hazard Mitigation Plan. This will make all available informational resources readily accessible to the public for their convenience.	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	18	1	22	1
4.1.1	Create "How To" Mitigation brochures for use at public events that would include information and pictures like that contained in FEMA's publications: Retrofitting for Homeowners Guide, Elevating Your Flood Prone Home, Elevating Residential Structures, and Information on NFIP	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	18	4	20	6
4.1.2	Provide Flood Insurance Rate Map (FIRM) information to people who inquire, and publicize this service	+	+	+	+	-	+	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	19	3	21	5

Mitigation Actions		P			A					S			T		E			E					L	Equal Weighting		Benefits & Cost Prioritization	
		Political			Administrative					Social			Technical		Economic			Environmental					Legal					
Action No.	Action	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance/Operations	Community Acceptance	Effect on Segments of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenges	Total Plus	Total Minus	Total Plus	Total Minus
4.2.2	Create displays for children's programs that teach safety. Examples of information used would be similar to that on the FEMA for Kids CD or for Sparky Fire Safety Program.	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	18	4	20	6
4.2.3	Develop and disseminate emergency guides on sheltering in place procedures	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	18	1	22	1
4.3.1	Target owners of properties within identified hazards areas for additional outreach regarding mitigation and disaster preparedness	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	18	4	20	6
4.3.2	Conduct outreach and educational programs to increase vigilance and potential impacts on invasive species of Lawrence County	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	18	1	22	1
4.3.3	Conduct a workshop to educate municipalities and residents on mitigation projects to reduce the impact of radon	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	18	1	22	1

APPENDIX J:
Annual Review Documentation

Appendix J: Annual review information will be placed in this section as completed.

APPENDIX K:

Lawrence County & Municipal Adoption Resolutions

RESOLUTION R-2016-~~057~~ 004

A Resolution by the Board of Commissioners of Lawrence County, Pennsylvania adopting the 2015 Lawrence County Hazard Mitigation Plan.

WHEREAS, the municipalities of Lawrence County, Pennsylvania are most vulnerable to natural and human-made hazards which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, Lawrence County acknowledges the requirements of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard Mitigation Grant Program funds, and

WHEREAS, the Lawrence County 2015 Hazard Mitigation Plan has been developed by the Lawrence County Commissioners and the Lawrence County Department of Public Safety in cooperation with other county departments, local municipal officials, and the citizens of Lawrence County, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Lawrence County 2015 Hazard Mitigation Plan, and

WHEREAS, the Lawrence County 2015 Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the County and its municipal governments,

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF COMMISSIONERS that:

- The Lawrence County 2015 Hazard Mitigation Plan is hereby adopted as the official Hazard Mitigation Plan of the County, and
- The respective officials and agencies identified in the implementation strategy of the Lawrence County 2015 Hazard Mitigation Plan are hereby directed to implement the recommended activities assigned to them.

ADOPTED, this **19th** day of **JANUARY, 2016**

ATTEST:

BOARD OF COMMISSIONERS