

Clarion County

April 9, 2019

Hazard Vulnerability Analysis

HAZARD VULNERABILITY ANALYSIS

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I. **INTRODUCTION**

A. **Purposes**

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

B. **Methods of Analysis**

How often disasters occur (frequency) and the effects or severity of the event is important as a basis for planning emergency response and mitigation. Natural occurring hazards tend to reoccur over time whereas technological caused and human caused events tend to change as technology changes and our way of doing things change.

Four criteria were selected to assure a systematic and comprehensive approach to analyzing all hazards:

1. History: A record of past events is particularly helpful in evaluating natural hazards. Both the frequency and severity of past events are useful in predicting the future. The past records of other events also offer valuable information when tempered with the knowledge of preventive efforts, and changes in technology that may reduce the frequency or severity of such an event. Other hazards exist and must be analyzed without the benefit of experience.
2. Vulnerability: The susceptibility of a community to destruction, injury, or death. The degree of vulnerability may be related to geographic location as with floodplains, or to the type of facility or structure. Certain population groups may be more vulnerable to some hazards because of immobility or their inability to take protective action.
3. The maximum threat or worst case disaster should be considered for each hazard. The maximum threat provides an upper boundary for the level of preparedness that may be necessary.
4. The probability of an occurrence in the future is another important factor to be considered when deciding on priorities, the level of preparedness and planning appropriate for a hazard. An event which occurs annually, though relatively minor in impact, may deserve more emphasis than a major event which occurs once in 50 or 100 years.

C. Selection of Hazards

National Fire Protection Association 1600 was used as the basis for determining hazards that effect Clarion County. We added oil and gas wells under Accidental Human Caused, Opioid Addiction under Intentional Human Caused and Animal or Insect Infestation or Damage under Biological Hazards. Each hazard was reviewed regarding the frequency of past occurrences, likely to reoccur or the potential for occurrence in the County. The probability of such an event occurring was rated at either low, medium or high.

1. Geological Hazard
 - a. Earthquake
 - b. Landslide, Mudslide, Subsidence
 - c. Radon
2. Meteorological Hazards
 - a. Drought
 - b. Extreme Temperatures (Heat, Cold)
 - c. Flood and Flash Flood
 - d. Geomagnetic Storms
 - e. Lightning Strikes
 - f. Snow, Ice, Hail and Sleet
 - g. Wildland Fire
 - h. Windstorm, Hurricane, Tornado, Dust Storm
3. Biological Hazards
 - a. Food-Borne Illnesses
 - b. Infectious/Communicable/Pandemic Diseases
 - c. Animal or Insect Infestation or Damage
4. Accidental Human Caused
 - a. Building/Structure Collapse
 - b. Entrapment
 - c. Explosion/Fire
 - d. Fuel/Resource Shortage
 - e. Hazardous Materials Spill or Release
 - f. Radiological Incident
 - g. Transportation Incident
 - h. Unavailability of Essential Employees
 - i. Water Control Structure Failure
 - j. Misinformation
 - k. Oil and Gas Wells
5. Intentional Human Caused
 - a. Structure Fire
 - b. Bomb Threat
 - c. Demonstration/ Civil Disturbance/Riot/ Insurrection
 - d. Discrimination/ Harassment
 - e. Disinformation
 - f. Kidnapping/Hostage
 - g. Missing Person
 - h. Cyber Security Incidents
 - i. Product Defect or Contamination
 - j. Robbery/Theft/Fraud
 - k. Strike or Labor Dispute
 - l. Suspicious Package (Container or Letter)

- m. Terrorism (Explosive, Chemical, Biological, Radiological, Nuclear, Cyber)
 - n. Vandalism/ Sabotage
 - o. Workplace/School/University Violence
 - p. Opioid Addiction
6. Technological Caused Events
- a. Hardware, Software and Network Connectivity Interruption, Disruption or Failure
 - b. Utility Interruption, Disruption or Failure

II. **COUNTY PROFILE**

A. **History**

Clarion County is a rural sixth-class county in Western Pennsylvania. It has a land area of 602 square miles and water area of 7 square miles with a 2010 census population of 39,988. When school is in session at Clarion University there is an increase in residents by approximately 3,000. The overall population density of the County is 66 persons per square mile.

Clarion County, erected on March 11, 1839 from parts of Venango and Armstrong Counties, is named for the Clarion River. Clarion County was the 54th county in the Commonwealth to be formed.

The history of the County has been dominated by extra active industries. Timber resources of white pine and hemlock rapidly stimulated an influx of population and as a result small lumber villages developed along the major streams. The discovery of bituminous coal provided further impetus to settlement and has played an important part in shaping the recent history of the County. Oil and natural gas have, at various times, spurred short-lived economic development. Bituminous coal, clay and stone products are important yet today.

B. **Physiological Features**

Clarion County is located in the west central part of the Commonwealth on the Allegheny Plateau. Redbank Creek forms the southern boundary and the Allegheny River forms a large part of the western boundary.

Clarion County has a forest area of over 159,000 acres. The largest stand of virgin white pine east of the Mississippi River is located in Cook Forest State Park of which the largest part is located in the County. There are 10.03 square miles of state parks and 18,183 acres of state game lands. These areas include facilities for boating, camping, fishing, and hunting, mountain biking and swimming.

C. **Demographics**

Clarion County is composed of 12 boroughs and 22 townships.

The boroughs, and their populations (2010 U.S. Census), consist of: Callensburg – 207; Clarion – 5,276; East Brady – 942; Foxburg – 183; Hawthorn – 494; Knox – 1,146; New Bethlehem – 989; Rimersburg – 951; Shippenville – 480; Sligo – 720; St. Petersburg – 400; and Strattanville – 550

The townships, and their populations (2010 U.S. Census), are: Ashland – 1,114; Beaver – 1,761; Brady – 55; Clarion – 4,116; Elk – 1,490; Farmington – 1,934; Highland – 525; Knox – 1,036; Licking – 536; Limestone – 1,858; Madison – 1,207; Millcreek – 396; Monroe – 1,544; Paint – 1,699; Perry – 947; Piney – 453; Porter – 1,348;

Redbank – 1,370; Richland – 494; Salem – 881; Toby – 991; Washington – 1,887
The County seat is located in Clarion Borough, in the central portion of the County, and has the highest percentage of the population.

D. Government

The County government is headed by an elected, three-member, Board of Commissioners, in addition to the offices of Judge, Sheriff, District Attorney, Treasurer, Register & Recorder, Prothonotary, Auditors, and Coroner. The County also operates a corrections facility, parks and airport.

The boroughs operate with a seven-person elected Council, together with a Mayor who serves as the chief executive officer. The townships have governments headed by a three-person, elected Board of Supervisors.

The following Fire, Emergency Medical Services, Law Enforcement and emergency service agencies provide primary services to the County:

Law Enforcement:

- Clarion Borough Police
- Clarion County Sheriff Department
- Clarion University Police
- Emlenton Police
- Knox Borough Police
- New Bethlehem Borough Police
- Pennsylvania State Police – Clarion & Marienville

Fire:

- Callensburg Volunteer Fire Company
- Clarion Fire & Hose Company
- Corsica Volunteer Fire Company
- East Brady Volunteer Fire Company
- Emlenton Fire Company
- Farmington Twp. Volunteer Fire Company
- Hawthorn Volunteer Fire Department
- Knox Volunteer Fire Department
- Limestone Township Volunteer Fire Department
- Millcreek Twp. Volunteer Fire Department
- New Bethlehem Fire Company #1
- Parker City Volunteer Fire Department
- Perry Twp. Volunteer Fire Department
- Rimersburg Hose Company, Inc.
- Shipperville-Elk Twp. Volunteer Fire Department
- Sligo Volunteer Fire Department
- St. Petersburg Volunteer Fire Department
- Strattanville Volunteer Fire Company
- Washington Twp. Volunteer Fire Department

Emergency Medical Services:

- Clarion Hospital EMS (3 stations)
- East Brady Ambulance

Emlenton Area Ambulance
Knox Area Ambulance
Shippenville Ambulance
Southern Clarion County EMS
Air Medical Helicopter (Life Flight and STAT)

Quick Response Services:

Hawthorn Volunteer Fire Department
Limestone Township Volunteer Fire Department
Millcreek Twp. Volunteer Fire Department

E. Education

Clarion County is home to Clarion University of Pennsylvania (CUP), a Commonwealth owned institution of higher learning (enrollment is approximately 4,500 students), located in Clarion Borough.

There are 7 public school districts with 16 school buildings, 3 private schools, 11 Amish schools, 1 Mennonite school and 1 Career & Technical school (which also offers adult education courses), along with other educational support/providers within Clarion County.

F. Healthcare

Clarion Hospital is a 62-bed acute care facility with 8 rehabilitation nursing beds. The hospital is licensed by the Pennsylvania Department of Health and is accredited by the American Osteopathic Association. The hospital provides a full spectrum of services on an inpatient and outpatient basis. These services are: Cardiopulmonary Services, Laboratory Services, Radiology Services, Nuclear Imaging, Cancer Care, 24-hour Emergency Medical Services, and Wound Care Center. The hospital participates in regional disaster preparedness activities. The ambulance service has 2 wheelchair transport vans, 8 Advanced Life Support (ALS) equipped ambulances. The facility can provide portable and onsite decontamination at Level C protection.

Clarion Psychiatric Center (CPC), a 112-bed behavioral health care facility, is situated on 11 acres located adjacent to Clarion Hospital. CPC offers assessment 24/7 and referral to appropriate level of care with credentialed professionals. Services available include adult program, adult drug and alcohol education, substance abuse rehabilitation services, day treatment for children and adolescents, inpatient adolescent and children's program, adolescent residential treatment facility and wraparound services for Clarion County.

Extend Health Care Facilities, there are 3 skilled care facilities and 3 personal care facilities within Clarion County.

Clarion Forest VNA operates an Adult Day Living Center. This Living Center is for adults seeking socialization, a safe environment and respite as they continue to live in their own home. The Living Center is open part of the day/week.

Primary Health Network and UPMC Urgent Care are 2 facilities in Clarion County that provide urgent care services (minor illnesses and injuries). These facilities are only open part of the day.

LIFE-NWPA Adult Day Health Center, is a community-based center (open part of the day/week), specifically designed to meet the physical, social and emotional needs of a participant in need of supervised care. In a safe and protected environment, participants attending the center may receive benefits such as:

- Health maintenance services including health monitoring, therapies and health education
- Opportunities for positive therapeutic social interaction
- Relief for working families and those who provide 24-hour care

Clarion University has the Center for Wellness Health Services which provides medical care for students with illnesses and injuries.

EMS Companies, currently there are 6 EMS Companies servicing Clarion County. On average, there are 10 units in service every day.

G. Recreation

The 7,182-acre Cook Forest State Park lies in scenic northwestern Pennsylvania, near the Allegheny National Forest. Once called "The Black Forest," the area is famous for its stands of old growth forest. The "Forest Cathedral" of towering white pines and hemlocks is a Natural National Landmark. The Clarion River is the eastern border of the Park, and is popular for canoeing and rafting.

Cook Forest State Park is known for its excellent fishing streams and ponds, plus hundreds of miles of hiking trails that wind their way through the forest. Cook Forest is classified as a National Natural Landmark by the National Park Service.

Piney Lake, located on the Clarion River in the center of the County, impounds a reservoir of about 650 acres in surface area and stores approximately 26,000 acre-feet of water at normal full pond there is about 28 miles of shoreline. Recreational boating is the most popular activity on Piney Lake. Brookfield Renewable Energy Group administers a private boat dock permit program, through which permits are issued to approximately 250 entities to install a seasonal boat dock on Piney Lake. Summer weekends and holidays are generally the busiest times on Piney Lake. Picnicking and fishing are popular shore-based activities, but the natural terrain (steep wooded slopes) surrounding Piney Lake generally limits these activities to areas that provide more formal access to the river.

Several local festivals take place in Clarion County throughout the year. The largest festival is the Autumn Leaf Festival (ALF). This is an annual tourist attraction, celebrating Clarion County's beautiful foliage. The event started in 1953. ALF has grown from a one-day event to a nine-day event with music, sports, majesty and fun activities, for all to enjoy. Autumn Leaf Festival brings approximately 500,000 people to the Clarion area and is a national homeland security event. Clarion University has their homecoming events during this festival.

The County operates the Clarion County Park consisting of 49.5 acres located in Paint Township. It consists of a baseball field, soccer field, softball fields, basketball court, tennis court, volleyball court, horseshoe pit, nature trail, playground, nine pavilions, 4-H Area, barn, Community Center, archery range, and a children's garden. The County also maintains a 3-acre park located at Helen's Furnace and Clarion Memorial Park across from the County courthouse.

H. Business and Industry

Agriculture has always been an important element of the County's economy. The market value of products sold for 2013 was 53 million dollars. There are approximately 1,182 farms using approximately 158,000 acres with the average size of each farm at 175 acres. These figures are based on the numbers released in 2012 for year ending, 2011. The number of individual farms and farm employment has increased over the years. (This information is current as of March 2019 according to the Department of Agriculture).

Presently, agriculture, including forestry, contributes significantly to the local economy. Many industrial businesses also support the area with the modular home and Clarion University, health care industry and service industries providing much of the economic basis for the County.

I. Communications

Three local newspapers, The Derrick, The Clarion News and The Leader-Vindicator, internet news via Explore Clarion and three radio stations, WCCR, WWCH and WCUC, provide communications media to the area.

J. Utilities

The Pennsylvania American Water Company, along with 14 community water systems and 37 transient water systems (these are camp grounds, restaurants, etc.) provide public water throughout most of the County. The more rural areas receive their water supply from private wells or springs.

Sanitation services are provided by 13 community wastewater treatment plants and 4 transient wastewater treatment plants.

Most of the electric power is provided to residents, business and industry by Allegheny Power, United Electric, Central Electric and Penelec.

Natural gas service is furnished primarily by Columbia Gas, Dominion Peoples, Equitable Gas, National Fuel, T.W. Phillips Gas, UGI Central Penn Gas and a few small suppliers of natural gas located throughout the County.

The major suppliers for telephone service are Verizon, EMBARQ, Venus and Windstream.

Comcast Cable Communications, Atlantic Broadband and AT&T Broadband are the major suppliers of cable television.

Internet providers include Verizon, Windstream, Comcast, AT&T, Venus, Zito, Atlantic Broadband, Choice and Affiniti.

K. Transportation

The major transportation network in the County includes: Interstate 80, U.S. 322, and State Routes 28, 58, 66, 68, 208, 338 and 368; and one commercial airport.

The County has six exits from Interstate 80, making it within short traveling distances from the cities of Erie, Pittsburgh and Youngstown (see map below).

Clarion County, Pennsylvania

Major Traffic Routes



NOTES

1. PA Route 66 joins with I-80 from Exit 60 to Exit 64.
2. PA Route 68 terminates at the intersection with US Route 322.
3. PA Route 66 joins PA Route 28 through part of downtown New Bethlehem.
4. Exit 64 is "Clarion University" exit, which becomes Greenville Ave. in Clarion.
5. Exit 62 is "Clarion" exit, which becomes Fifth Avenue in Clarion.

III. HAZARDS

A. Geological Hazards

1. **Earthquakes**

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.

History / Vulnerability

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

Probability

The probability of such an event occurring is **low**. The Pennsylvania Hazard Mitigation Plan lists Clarion County in the very slight zone for earthquakes. Clarion County does not sit on any fault lines. Per Millersville University's seismic risk study, Clarion County has a very slight-to-slight risk of earthquakes.

Mitigation

Due to low probability of occurrence there are currently no mitigation efforts.

2. **Landslide, Mudslide, Subsidence**

Landslide

A landslide is the downward and outward movement of slope-forming materials reacting to the force of gravity. Slide materials may be composed of natural rock, soil, artificial fill or combinations of these materials. The term landslide is generalized and includes rock falls, rockslides, block glide, debris slide, earth-flow, slump and other such terms.

Those factors which increase a slope's potential for landslides are as follows:

- Excavations that remove lateral support or steepened slopes;
- The adding of loads, such as fill or structures, to natural slopes;
- Poor surface or subsurface drainage;
- The loss of water from leaking sewage and water supply facilities; and
- Changes in vegetation which cause changes in soil moisture and soil density, such as removing vegetation from slopes.

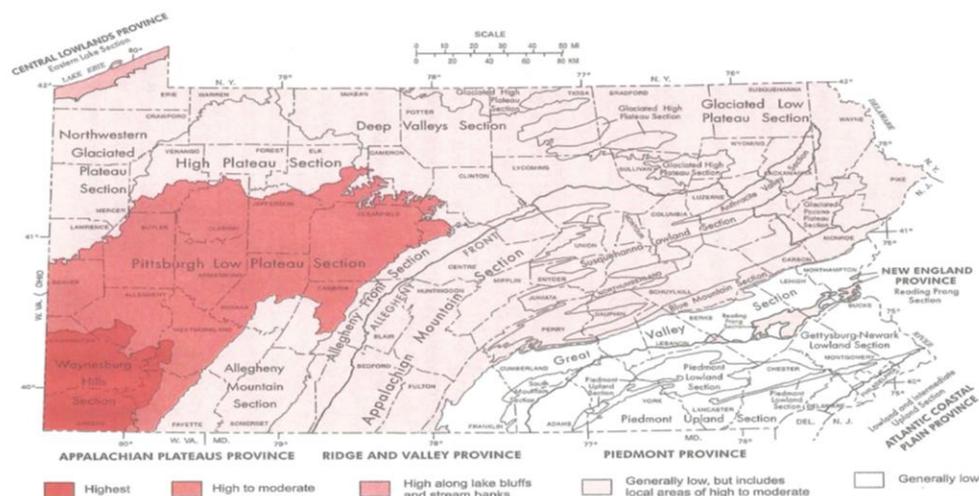
History/Vulnerability

Landslides are not a serious risk in the majority of Clarion County but are more likely to occur due to the hill and valley areas of Clarion County. Limited areas of steep slopes associated with the banks of major watercourses in the County could collapse under heavy rainfall to produce a localized landslide. The potential of damage to lives or property

from this type of natural hazard is high to moderate.

Clarion County is in the High to Moderate susceptibility area of Pennsylvania; however, only one major landslide has been recorded up to and including 2018.

Pennsylvania Landslide Susceptibility



There was one major landslide recorded in 1983. This incident occurred when a slide blocked PA Route 28, north of New Bethlehem. This slide occurred May 22, 1983, and caused major problem for emergency traffic for approximately six weeks.

Because of the terrain and geological makeup of the County, such slides can occur again.

Probability

The frequency of landslides occurring in the County is expected to remain **low**, and the effects of these incidences will continue to pose a threat to the County. If population and development increases in Clarion County, the number of persons and properties vulnerable to the effects of landslides may increase.

Mitigation

Some measures do exist to lessen the dangers of landslides. These measures include the Storm Water Management Ordinance 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 or near them (leave them undisturbed).

Mudslide

A mudslide is the downward or outward movement of materials reacting to the force of gravity caused by heavy rain. Slide materials may be composed of natural rock, soil, artificial fill or combinations of these materials.

History/Vulnerability

Because of the terrain and geological makeup of the County, most of Clarion County is in the High to Moderate susceptibility area of Pennsylvania. There have been no major mudslides in Clarion County. There was 1 minor slide in 2017 located in Madison Township.

Probability

The frequency of mudslides occurring in the County is expected to remain **low**, and the effects of these incidences will continue to pose a threat to the County. If population and development increases in Clarion County, the number of persons and properties vulnerable to the effects of mudslides may increase.

Mitigation

Some measures do exist to lessen the dangers of mudslides. These measures include the Storm Water Management Ordinance 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 mudslide areas exist and to avoid building on or near them (leave them undisturbed).

Subsidence

Subsidence is defined as a sinking movement of the earth's surface usually described as a sinkhole. Subsidence may be natural or related to mining activities. Areas underlain by coal or other minerals which use deep mining techniques may become susceptible to subsidence. Poor engineering practices at the time of withdrawal or progressive degradation in geological stability contribute to subsidence. Areas of the Commonwealth that have underlying mines are subject to subsidence and constitute a potential threat to people living in those areas. Isolated incidents throughout the coal regions over the years have been houses, garages, and trees swallowed up by subsidence holes. Lengths of local streets and highways, and countless building foundations have been damaged.

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

History/Vulnerability

The County is threatened by both major types of subsidence. Over 70% of Clarion County's municipalities are subject to surface and subsurface sinkhole occurrence. A number of coal beds have been involved in underground mining. The few mine maps available show that generally the mining that has occurred has been very deep.

There are records of mining in these municipalities by Pennsylvania Department of Environmental Protection:

Mining History in Clarion County		
Brady Township	Madison Township	Redbank Township
Clarion Borough	Monroe Township	Rimersburg Borough
Clarion Township	Paint Township	St. Petersburg Borough
East Brady Borough	Perry Township	Strattanville Borough

Hawthorn Borough	Piney Township	Toby Township
Knox Township	Porter Township	Washington Township
Limestone Township		

According to Pennsylvania Department of Environmental Protection there are 1,056 active and abandoned coal mines in Clarion County.

There are reports of subsidence in Clarion County:

In August 2003, two sinkholes measuring four feet in diameter and twenty feet deep were discovered near a residential area in Clarion Township. The Pennsylvania Department of Environmental Protection’s Bureau of Abandoned Mine Reclamation (BAMR) investigated and mitigated the holes.

In the spring of 2010 in Clarion Borough, at the old Rhea Lumber facility on East Wood Street, a hole opened that was approximately 4 feet deep and 3 feet wide. Clarion University, the current owner, mitigated the hole.

Pennsylvania Department of Environmental Protection has no records of any other sinkhole activity incidents.

Clarion Borough and some other municipalities are having subsidence issues caused by storm drain pipes collapsing and deteriorating.

Currently there are three open mine shaft subsidence located in St. Petersburg Borough.

Probability

The frequency of subsidence incidences occurring in the County is expected to remain **low**. However, considering mining activity that has occurred in the County and storm drain pipes collapsing and deteriorating, subsidence cannot be ruled out.

Mitigation

Since all municipalities in Clarion County are vulnerable to the hazard of subsidence, local and County officials should follow some of the following hazard mitigation measures: encourage local awareness of the subsidence hazards; compliance with or enactment of building codes and regulations that consider geologic factors; preparedness to respond to and cope with a geologic hazard occurrence, encourage local property owners to purchase subsidence insurance and replace storm drain pipes that are collapsing and deteriorating.

3. Radon

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, PA, showed that readings on Mr. Stanley Watras frequently exceeded expected radiation levels, yet only natural, nonfission-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 with 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, ^{222}Rn and ^{220}Rn , formed in the radioactive decay series of ^{238}U and ^{232}Th , respectively. The isotope thoron (i.e. ^{220}Rn) 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. ^{222}Rn), 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. ^{226}Ra), 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.

History/Vulnerability

According to the EPA 1993 Pennsylvania Radon Zones, Clarion County Falls in to Zone 1, which has the highest potential for Radon exposure. Pennsylvania Hazard Mitigation Plan estimates that 20% of the buildings in the County are impacted by radon with a mitigation cost of approximating \$9,492,720.00.

Probability

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. The incidents in the County is expected to remain **moderate**, with proper preventive measure.

Mitigation

Enforce building codes for radon mitigation. Encourage residents and businesses to test their buildings and mitigate as per codes.

B. Meteorological Hazards

1. Drought

Droughts have hit the Commonwealth many times within the last 30 years. The Commonwealth has been most vulnerable to hydrologic and water management droughts. Hydrologic droughts generally entail a reduction of stream flows, reduction in lake/reservoir storages and the lowering of ground water levels. Water management droughts are a result of abnormally dry periods and the failure to adhere to water management practices during these times. During the summer of 1983, the worst drought in 20 years occurred, causing over \$196 million in damages to the Commonwealth's crops. Severe droughts have also occurred during 2001 and 2002.

History/Vulnerability

Clarion 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. From 2014 - 2018 Clarion County has had 1 drought watch (per Pennsylvania Department of Environmental Protection).

Although a severe drought could have a devastating impact on the entire community it was determined to be the least likely to occur. However, communities in Clarion County could potentially experience problems associated with drought conditions. The biggest concern in these communities is the high demand on the water supply and below average rainfall for recharge of aquifers and reservoirs.

The main type of drought that could be included in this all-hazard mitigation plan is a hydrological drought. A hydrological drought occurs when surface and subsurface water levels drop, such as in streams, rivers, lakes, and reservoirs.

Agriculture being an important element of the County's economy (market value of products sold for 2013 was 53 million dollars) could be impacted greatly by a long drought. With approximately 1,182 farms, a drought could also affect the families and farm workers.

There have been sporadic instances where municipal water systems have lost their entire water reservoir. The water reservoir loss has been due to system malfunctions; either pumps failure or massive supply line leaks, and have generally been corrected within 24 hours. The farming community is exceptionally vulnerable to drought.

In 2018, several of Clarion County's municipal water systems experienced system malfunctions. These malfunctions include water main breaks and leaks, (2017 – 25 reported and 2018 – 28 reported), loss of power that shut down plant, water outages and loss of water source. These incidents are indications of the aging of the infrastructure in Clarion County. One municipal water company is currently in the process of building a new plant and one has to drill a new well.

The Pennsylvania Department of Environmental Protections' records indicate that there are 14 municipal water suppliers in Clarion County. Of those; three (3) use surface water (rivers, streams) as their source of supply. The remainder use wells and springs. There are also small transient water systems (these are camp grounds, restaurants, etc.) which primary use wells for their water source.

Currently there are no water suppliers that are projected to experience future yield deficiencies.

Probability

Future droughts and water deficiencies are likely to occur in Clarion County as demands increase for water by various industrial, residential and agricultural consumers. In addition, increased new development in the County could affect water supplies.

It would be very difficult to forecast the future frequency and severity of drought emergencies in Clarion County. However, a drought situation could cause major shortages in private and public water supplies and crop damage on an extensive basis. The frequency of droughts occurring in the County is expected to remain **low**.

Mitigation

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.

One form of mitigation, in regards to municipal water authorities in Clarion County, is the purchasing of smaller water authorities by larger water providers, or consolidation of water authorities.

Also, expansion of current municipal water service areas would provide more opportunity for spring/well reliant residents to secure a dependable water source.

2. Extreme Temperatures (Heat, Cold)

Extreme Temperature events, by definition, are rare. An extreme temperature is when the temperature drops or raises to a level which occurs less than 5% of the time.

History/Vulnerability

There is no history of this type of event in the last ten years affecting the County according to the National Weather Service.

In the event of extreme temperatures, there may be an impact to a large concentration of vulnerable citizens because of the rural nature of most of the County.

The homeless, elderly and sick populations in the County are the most at risk.

Probability

While the probability for this type of event is **low**, there is a chance that it could occur in the County.

Mitigation

Maintain the County Extreme Temperature Plan. Maintain and increase ways for providing information to the public. Develop and maintain policies and procedures to assist the public during extreme temperatures (i.e. Comfort Care Centers, utilities issues, etc.).

Work with human service agencies and faith-based organizations to aid homeless, elderly and sick populations in the County during this type of event.

3. Flood and Flash Flood

Floods and flash floods are the most prevalent type of natural disasters occurring in the Commonwealth of Pennsylvania. Clarion County is located in the Central Allegheny River Basin, as designated in the Commonwealth Water Plan.

In the Commonwealth, floods cause over \$1 billion worth of property damage annually. It is, therefore, important for emergency management personnel to analyze floodplains and other critical areas in the County and determine how vulnerable to flooding the community might be.

History

Floods and flash floods continue to be frequent and damaging natural disasters in Clarion County (see below).

Date	Flood Type	Comments/Type of Declaration
8/3/18	Flash Flood	Flash flooding in Foxburg Boro., Richland Twp. and Washington Twp.
7/2018	Flash Flood	Flash flooding in Knox Twp. and Washington Twp. (disaster declaration)
2/2018	Flash Flood	Flash Flooding in Licking Twp.
1/2018	Flash Flood	Flash flooding in Highland Twp., Millcreek Twp., Piney Twp. and Monroe Twp.
7/2017	Flash Flood	Flash flooding in Farmington Twp. and Millcreek Twp.
5/2017	Flash Flood	Flash flooding in Beaver Twp., Clarion Borough, Sligo Borough, Elk Twp., Highland Twp. and Paint Twp.
1/2017	Flash Flood	Flash flooding in Madison and Redbank Townships
6/2016	Flash Flood	Flash flooding in Elk, Farmington and Washington Townships from heavy rain.
2015		None Reported
7/2014	Flash Flood	Flash flooding in East Brady and Rimersburg Boroughs, Madison and Porter Townships
6/2014	Flash Flood	Flash flooding Sligo area from heavy rain.
Yearly	Ice Jam	Especially along the Allegheny River between Parker and East Brady, Clarion River from Route 36 bridge to the Allegheny River and Redbank Creek upstream of the dam in New Bethlehem.
Yearly	General/Flash Flood	Late spring, early summer flooding, especially along the Redbank Creek and Allegheny River.

Stream, river, and urban flooding can occur at any time during the year. Flooding may be in the form of flash floods caused by summer storms or rapid snow melt or general, river flooding caused by prolong rains, attributed to multiple storm systems crossing the area over a period of time, or from a tropical disturbance.

Flash floods can occur within several seconds to several hours, with little warning. Flash floods can be deadly because they produce rapid rises in water levels and have devastating flow velocities. Several factors can contribute to flash flooding. Among these are rainfall intensity, rainfall duration, surface conditions, and topography and slope of the receiving basin. Urban areas are susceptible to flash floods because a high percentage of the surface area is composed of impervious streets, roofs, and parking lots where runoff occurs very rapidly.

Ice-jam floods occur on rivers that are totally or partially frozen. A rise in stream stage will break up a totally frozen river and create ice flows that can pile up on channel obstructions such as shallow riffles, log jams, or bridge piers. The jammed ice creates a dam across the channel over which the water and ice mixture continues to flow, allowing for more jamming to occur.

Backwater upstream from the ice dam can rise rapidly and overflow the channel banks. Flooding moves downstream when the ice dam fails, and the water stored behind the dam is released. Now the flood takes on the characteristics of a flash flood, with the added danger of ice flows that, when driven by the energy of the flood wave, can inflict serious damage on structures. An added danger of being caught in an ice-jam flood is hypothermia, which can quickly kill.

General floods are caused by precipitation over a longer time and over a given river/stream basin.

A combination of river basin physiography, local thunderstorm movements, past soil moisture conditions, and the degree of vegetative clearing determine the severity of a flooding event. Flooding is typically most severe in areas of the floodplain immediately adjacent to major streams and rivers.

Flooding can be as frequent as the occurrence of a spring rain or summer thunderstorm. The amount of precipitation produced by storm events determines the type of flooding. Flash floods, which typically occur more frequently than general floods, occur along small streams and creeks of the type that are widely present throughout northwest Pennsylvania.

The undermining or washing out of roads is typically associated with flash floods. General flooding occurs less frequently and as the result of much larger storm events such as hurricanes. These larger storm events occur in northwest Pennsylvania most often in the late spring and summer.

Both flash flooding and longer-term general flooding can cause massive damage and destruction to the structures located in these floodplains.

Vulnerability

In the County 30 of the 34 municipalities are flood prone. Allegheny River causes flooding in Brady, Madison, Perry, Richland and Toby Townships and East Brady and Foxburg Boroughs. The Clarion River causes flooding in Callensburg Borough and Beaver, Farmington, Highland, Millcreek, Monroe, Paint, Perry, Piney and Richland Townships. Piney Creek causes flooding in the Limestone-Reidsburg areas, Licking Creek floods around Sligo, and Redbank Creek floods in Madison, Porter, Redbank Townships and New Bethlehem and Hawthorn Boroughs.

There is always the opportunity for more than one flood in a year in any area of the County. In addition, the County is susceptible to seasonal and flash floods because of heavy or prolonged rainfall, rapid thaw of snow and/or ice, or ice jams.

Seasonal flooding occurs in late spring/summer. This type of flooding is generally caused by storms of low to moderate rainfall intensity over a long period of time covering the entire area of principal watersheds. Many Commonwealth and federal flood protection projects in the area have served to reduce the average annual damages in the basin from \$7.3 million to \$633 thousand per year.

Probability

Although it is impossible to predict the number or severity of flood incidents that may occur in the County, it is safe to predict that if increased development occurs on presently unused land and the hilly topography of Clarion County; that the damage to crops, roads, businesses, utilities and private residences will increase in the future. Clarion County can safely assume to receive some type of flooding somewhere in the County on an annual basis with major widespread flooding expected every 4-5 years.

To address possible increases in flood related losses, development in floodplain areas should be regulated closely, and structural and nonstructural measures should be

reviewed to determine flood damage reduction potential. The frequency of floods/flash floods occurring in the County is expected to remain **high**.

Mitigation

Preventive measures by County and local officials are the most effective way to reduce property damage from flash floods. Such measures include:

- a. Establish rain gauges throughout the County with volunteers to read and report information. Currently we have 7 locations reading and reporting rain information.
- b. Establishing and periodically updating the local Flash Flood Warning system.
- c. Implementing floodplain management via local municipal ordinances.
- d. Developing an adequate preparedness and response plan for flash flood emergencies.

The following land development policies should be implemented and enforced countywide by the County Commissioners, and by each local municipality:

- a. New developers must prove that their construction will not increase runoff from existing undeveloped levels.
- b. Storm drains and culverts, located in flood hazard areas, should be sized for 100-year flood flow with adequate freeboard (1.5 feet) to provide for flow increases caused by future development upstream.
- c. Underground drainage lines should be provided in areas where the allowed average residential density is three housing units per gross acre or greater.
- d. All bridges and culverts should be designed for 100-year flood flow if they have a potential to cause property damage when they become blocked up with storm water deposited debris.

The following floodplain land development policies should also be implemented and enforced by the County, if not by the individual municipality:

- a. Although the 100-year flood flow is used for defining the floodplain, a freeboard of 1.5 feet minimal should be included for potential unforeseen hazards.
- b. All structural development within the 100-year floodplain should be restricted.
- c. Such nonstructural development as parks, recreation areas, athletic fields, and picnic areas could be permitted within the 100-year floodplain.
- d. Strict encroachment regulations should be included in floodplain planning to prevent filling of the floodplain.
- e. Local municipal resolutions should be made to restrict the extension of water, sewer, roads, or other critical or public facilities into the 100-year floodplain. This is not meant to negatively impact services or other infrastructure to current or future development beyond the pertinent floodplain.

Numerous general development policies that may be adopted and/or encouraged by local municipalities (pending review by legal counsel) to assist in averting potential storm water damage include:

- a. Maintenances of the Stormwater Management Ordinance.
- b. River and stream banks should be cleared of all loose material which could be carried downstream during a flood. Fines should be levied against offenders.
- c. Citizens' groups should be encouraged to help maintain flood protection measures. For example: removal of debris from culverts, clean stream banks, etc.
- d. Local municipalities should aid debris collection by providing necessary equipment.
- e. State and municipal road crews should maintain culverts located under roadways to prevent buildup of debris.

- f. Roadway embankments serving as stream channel banks or dikes should be well stabilized with rock, earth and vegetative cover to prevent road washouts.
- g. A suggested list of runoff reducing measures should be given to builders when they apply for building permits.
- h. Developers should be required to provide 0.25 acre-ft. of storage capacity for every acre of impervious surface material.
- i. Developers should be encouraged to utilize underground utilities wherever possible. Even though underground power lines have a higher construction cost, the annual cost will be lower because these lines lower the maintenance cost and significantly reduce power outages normally caused by broken or short-circuited lines. Also, underground lines are more aesthetically pleasing than utility poles, thus increasing the property value.
- j. Owners of buildings that are located in the floodplain shall be advised by the municipality on how to flood proof and structurally reinforce their building to at least the 100-year flood elevation.
- k. Developers and municipal authorities should utilize check valves on all sewer and storm drain lines to prevent backup of water into serviced buildings.
- l. An informed public can also go a long way to reduce property damage and loss of life from flash floods. Each property owner in Clarion County should know the following:
 - 1) What rivers and creeks are hazards to their property and at what flood level their property will be affected.
 - 2) A safe evacuation route if their house is flooded.
 - 3) If they live on a farm, not to place or allow small animals (calves and pigs) in areas subject to flash floods.
 - 4) Never disregard an official evacuation advisory.

4. Geomagnetic Storms

In solar-terrestrial terms, a worldwide disturbance of the Earth's magnetic field, distinct from regular diurnal variations. A geomagnetic storm is a temporary disturbance of the Earth's magnetosphere caused by a disturbance in space weather. These types of storms could affect all or part of the communication systems, internet and utilities in the County. Geomagnetic storms are categorized from G1 – G5. See chart from NOAA Space Weather below:

Category		Effect
Scale	Descriptor	Duration of event will influence severity of effects
G5	Extreme	Widespread voltage control problems and protective systems problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage.
G4	Severe	Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid.
G3	Strong	Voltage corrections may be required, false alarms triggered on some protective devices.
G2	Moderate	High-latitude power systems may experience voltage alarms, long duration storms may cause transformer damage.
G1	Minor	Weak power grid fluctuations can occur.

History/Vulnerability

There have been occurrences of G 3 storms over the last ten years and the latest on was in August of 2018 and there was no reported damage with this occurrence. There has been no reportable damage with other storms, but they occur with relative frequency.

These types of storms affect communication systems and utilities. Maintain systems for backing up radio communication for both emergency services and public information. Evaluate all County radio towers and equipment locations to determine protection needs. Work with utility companies to protect equipment.

Worst case could cause total loss of all communication systems and utilities. All municipalities are at risk from these storms.

Probability

While the probability for this type of event is **low**, there is a chance that it could occur in the County. Over the past few years there has been an increase in solar flare activity.

Mitigation

These types of storms affect communication systems and utilities. Monitor National Weather Service, Space Weather Prediction Center for geomagnetic storms. Maintain systems for backing up radio communication for both emergency services and public information. Evaluate all County radio towers and equipment locations to determine protection needs. Work with utility companies to protect equipment.

5. **Lightning Strikes**

Lightning strikes mostly occur during storms of late spring, summer and early fall. Each year, lightning is responsible for the deaths of a hundred or so people, injuries to several hundred more, and millions of dollars in property damage, in the United States. Many case histories show heart damage. Inflated lungs and brain damage have also been observed from lightning fatalities. Loss of consciousness, amnesia, paralysis and burns are reported by many who have survived. 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.

History/Vulnerability

According to the National Weather Service there are on average 1-2 lightning strikes per square mile/per year.

2014

On June 18, 2014 a truck hauling Hazardous Materials was struck by lightning while driving along Interstate 80. No materials were spilled, driver had minor injuries and truck had major damage.

Clarion County Courthouse and Communication Center were each struck by lightning with damages to electric systems, safety systems, computer systems and radio equipment.

Probability

Clarion County could expect approximately 600-1200 lightning strikes per year. However, there are only 7-14 reported lightning strikes per year. The frequency of lightning strikes occurring in the County is expected to remain **high**.

Mitigation

Because lightning strikes can occur anywhere in Clarion County, it is imperative to have a good warning system and inform the public on what to do if/when storms are imminent.

It is also important that safety devices be incorporated into structures that are high risk (radio towers, tall buildings, etc.).

6. Snow, Ice, Hail and Sleet

Winter storms occur on an average of five times a year in Pennsylvania. These storms may include snow, ice and sleet alone or in combination coupled with high winds. The predominant type of air which influences the climate of Clarion County has a polar continental source in Canada and moves in upon the region by way of tracks which vary from almost due north from the Hudson Bay region to a long westerly trajectory resulting from polar outbreaks into the Rockies which progress eastward.

During the winter season, air from the Gulf of Mexico occasionally reaches the area and causes the normal alternate periods of freezing and thawing. During the winter months about a fourth of the precipitation occurs as snow and there is about a 20 percent chance of precipitation on any day. The first appreciable snowfall is generally late in November and usually the last occurs in early April. Greatest monthly snowfall amounts occur in December and January, however, greatest amounts from individual storms usually occur in March as the moisture supply increases.

Winter storms can produce more damage than any other severe weather event, including tornadoes. These storms cause damages to communication networks, kill vegetation, collapse structures because of ice loading and falling tree limbs, and cause traffic accidents. The National Weather Service estimates that 85 percent of ice storm deaths are traffic related.

Flooding can also be a damaging by-product of winter storms due to a rapid thaw.

History/Vulnerability

Clarion County experienced major winter storms in 2014 - 2018 (see below).

Date	Type	Declaration
11/16/2018	Winter Weather	None
3/8/2018	Winter Weather	None
2/7/2018	Heavy Snow	None
1/29/2018	Winter Weather	None
1/12/2018	Winter Storm	None
2/15/2016	Ice Storm	None
3/3/2015	Winter Storm	None
1/7/2015	Winter Storm	None
2/4/2014	Winter Storm	None

Within the past five years, winter storms in Clarion County have caused the following:

- a. Power failures lasting hours/days.
- b. Loss of communication networks lasting four hours or more.
- c. Road closure for 24 hours or longer.
- d. Stranded motorists requiring emergency transportation or temporary shelter, primarily from Interstate 80.
- e. Residents requiring Comfort Centers, evacuation or provision of supplies.
- f. Loss of water supplies.
- g. Structure collapse (February 2015 a business on Rt. 322 had roof collapse from

- heavy snow load and building disrepair)
- h. Major accident on Interstate 80, causing road closure for over 10 hours.
- i. School closing, delays or early dismissals.

Clarion County is vulnerable to winter storms varying in degrees of severity. These storms can cause road closings in the County, especially on secondary and farm roads that become virtually impassable. Winter storms have left motorists stranded, often requiring emergency assistance.

Winter storms in the County may cause business losses to all commercial centers. There could be property losses to both commercial and residential areas as a result of snow and ice loading, falling tree limbs and frozen pipes. During a winter storm, Clarion County households may become vulnerable to interruptions in utility services for heat and electricity. During power outages, residents either use alternative heating sources or relocate to friends or relatives' houses. During widespread power outages, local fire halls, schools and churches provide heated shelter areas.

Because of Clarion County's rugged terrain, all major roads are prone to being hazardous because of winter storms. Interstate 80 is the major roadway in the County, but is seldom closed, however, is the chief source of stranded motorists. Other main roads that normally remain open but are hazardous during winter storms are U.S. 322, Pennsylvania Routes 28, 36, 38, 58, 66, 68, 208, and others. Township roads are prone to closing, but most residents have alternative routes of travel.

Probability

The severity and frequency of major winter storms is expected to remain fairly constant. However, due to increased dependence on various modes of transportation and use of public utilities for light, heat, and power, their disruption by these storms is far more significant today than in the past. The frequency of snow, ice, hail and sleet storms occurring in the County is expected to remain **high**.

Worst case scenario would be a major snow storm across the County completely closing the County down for 5-7 days; total damages could exceed 15 million dollars.

Mitigation

It is an ongoing responsibility for our County officials and municipal officials to prepare for these winter storms. Means to reduce the hazards of these storms include building codes enforced to prevent structure collapse, discourage travel, early dismissal for public places and businesses, planned emergency measures for dealing with power loss, and emergency measures for rescuing stranded motorists.

7. Wildland Fire

Wildfires occur throughout wooded and open vegetation areas of Pennsylvania. 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 or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

Many fires have the potential for disaster or extensive loss of property and death. There are a number of factors which may influence the probability or likelihood that a fire may

develop into a disaster. Based on historical record, our own experiences and an examination of the circumstances surrounding various situations, we can improve our understanding of fire hazards that may lead to disaster.

History

Most fire disasters are averted by early warning and appropriate response. Even though only a small portion of these incidents resulted in significant property damage and even fewer in personal injury or death, a larger portion could have resulted in disaster had the emergency response not been timely and effective.

A summary of fires follows:

2018: 94 brush fires were reported most were caused by debris burning. The largest was a 13.74 acres field fire caused by debris burning. Total area burned for the year was 16.5 acres.

2017: 118 brush fires were reported most were caused by debris burning. The largest was a 1-acre field fire caused by debris burning. Total area burned for the year was 15 acres.

2016: 89 brush fires were reported most were caused by debris burning. The largest was a 13.10 acres field fire caused by equipment use. Total area burned for the year was 27.5 acres. 30 day burn ban was placed in effect on July 28.

2015: 84 brush fires were reported most were caused by debris burning. The largest was a 2 acres field fire caused by equipment use. Total area burned for the year was 28.7 acres.

2014: 87 brush fires were reported most were caused by debris burning. The largest was a 5 acres field fire caused by equipment use. Total area burned for the year was 38 acres. Note: This data is based on what was reported. Most fire officials did not report acres burned and/or cause.

Vulnerability

The vulnerability of persons and property to fire depends on a number of factors, such as the structural materials used in the facility, the contents stored in the facility, the response time by fire companies, and any lack of fire warning. Clarion County's volunteer fire companies generally have an adequate level of training and have a good response time. Within the past ten years, many of the County's fire companies have entered into automatic mutual aid agreements with their neighboring companies, thereby increasing the equipment and manpower responding to incidents.

Given the rural nature of Clarion County including historic forests, river frontage with old stands of timber, vegetation growth on reclaimed mine sites and urban interface, most of the County is exposed to the probability of some type of wildland fire. All municipalities are at risk from wildland fires. Clarion County is in the medium to high probability for wildfire hazard (Pennsylvania Hazard Mitigation Plan).

Probability

Although comprehensive fire figures are not available, it is safe to say that the number of small fires in Clarion County has remained fairly constant. However, the number of major fires remain **low**. It is expected that with expanded prevention programs, burn bans and

better fire department training, this trend will continue.

Mitigation

Man has been responsible for well over 50 percent of all forest fires in the United States. These fires are usually the result of carelessness, failure to extinguish campfires, arson, etc. The Bureau of Forestry has been credited for the decline in the number of hazardous forest fires. Through their organization of fire observers, equipment, training, public education, and timely issued county-wide burning bans, we are relatively free from major forest fires in Clarion County.

Encourage business owners and residents to clear and remove dead vegetation and all debris that could fuel a fire.

Increase public education on wildfire mitigation and prevention. Offer public information programs on wildfire prevention and homeowner awareness. Promote more fire prevention programs at schools, targeting not only students but faculty as well.

Provide more press releases, both pre-fire season and at times of high/elevated fire danger, for public awareness.

Encourage that **ALL** wildfires be reported by Volunteer Fire Departments to the Bureau of Forestry.

Offer training to Volunteer Fire Departments and homeowners on mitigation practices. Target contractors (logging, excavation, gas industry) and educate them on equipment maintenance and wildfire safety and prevention, related to their industry. Provide fire safety information at campgrounds across the County.

8. Windstorm, Hurricane, Tornado, Dust Storm

The Commonwealth is vulnerable to all wind related hazards. Tornadoes and windstorms are common occurrences, especially during spring and summer months. Areas of the Commonwealth are most prone to tornadoes/windstorms are the southeast, southwest and the northwest sectors.

History/Vulnerability

The National Weather Service archives show that Pennsylvania has experienced over 700 tornadoes, ranging in magnitude from F0 to F5 (Enhanced Fujita Scale) resulting in deaths and over 2 billion dollars of property damage, since 1950. In that same period and prior to 2017, Clarion County had experienced 7 tornadoes (with the magnitude of F2 being the highest) resulting in 1 death and over \$700,000 of property damage.

On May 1, 2017, Clarion County had 4 confirmed tornadoes in the County, 2(EF0) and 1 (EF1) in Farmington Township and 1 (EF0) in Beaver Township. No injuries were reported, with damages to homes, barn and cabins, many trees down and utility outages. On June 19, 2017, we had 1 (EF0) in Elk Township, with damages to homes, barn and out buildings, many trees down and utility outages. On July 11, 2017, we had 1 (EF0) in Toby Township, no structure damage but many trees down and utility outages.

Tornadoes do occur in Pennsylvania, and at least one tornado has been noted in almost all counties since the advent of severe storm records in 1854. June is the month of highest

frequency, followed closely by July and August. A significant exception to this is May 31, 1985. On that day, northwest Pennsylvania experienced 20 different tornadoes (including 1-F5, 6-F4s, 5-F3s, and 4-F2s). The final figures for this day alone, showed 65 fatalities, hundreds injured, and property damages in the hundreds of millions of dollars.

Windstorms are usually associated with hurricanes or tornadoes, but frequently occur with thunderstorms. Some windstorms (microbursts) often mistaken for tornadoes, can be just as devastating as a tornado. Wind sheers are usually found when a violent weather front is moving through and wind speeds of up to 100 mph have been recorded. Thunderstorms normally occur during all months except the midwinter ones, and have a maximum frequency in midsummer.

The National Weather Service has reported severe windstorms in Clarion County: 5 in 2018, 6 in 2017, 5 in 2016, 6 in 2015 and 5 in 2014. All these severe windstorms showed wind gusts over 57 miles per hour (see Appendix 1).

The destruction from these storms can be tremendous, destroying buildings, uprooting trees and injuring people. Winds associated with these storms can reach 100 mph and cause major damage. These winds, called microbursts, caused straight-line winds estimated to be more than 100 mph. Fire companies were dispatched for trees down during these storms 2018 there were 465 dispatches, 2017 there were 503 dispatches, 2016 there were 219 dispatches, 2015 there were 148 dispatches and 2014 there were 175 dispatches.

Many County residents claim that the high wind damage was caused by tornadoes. Whether these storms were tornadoes or downburst/microburst are actually irrelevant because windstorms of all types have caused the following problems within the County:

- a. Power failures lasting four hours or more.
- b. Loss of communications networks lasting four hours or more.
- c. Residents requiring evacuation or provision of supplies or temporary shelter.
- d. Severe crop losses/damage.

Probability

Given past history, including the fact that 6 tornadoes occurred in Clarion County in May, June and July of 2017, the odds are heavily in favor of a tornado or downburst/microburst-type storm occurring at any time in Clarion County.

If population increases and if development increases in Clarion County, the number of persons and properties vulnerable to the effects of tornadoes and windstorms are expected to increase. The frequency of wind storms occurring in the County is expected to remain **high**.

Mitigation

Because tornadoes can strike anywhere in Clarion County, especially during the spring and summer months, it is imperative to have a good warning system and an informed public that knows what to do and where to go if a tornado strike is imminent.

To improve the warning time available, Clarion County also has direct communication capabilities with Pennsylvania Emergency Management Agency (PEMA) for information and warnings via the Commonwealth 800 radio system and the EMnet systems.

Commonwealth 800 radio system connects the 9-1-1 dispatch center with Pennsylvania Emergency Management Agency EOC, and up to date information can be relayed back and forth. EMnet is a satellite based messaging system. The EMnet System is the medium transporter for the Emergency Alert System (EAS)/Integrated Public Alert and Warning System (IPAWS) which can be utilized directly from the 9-1-1 dispatch center, to initiate emergency broadcasts of severe weather alerts issued by the National Weather Service (NWS). EMnet and the EAS/IPAWS system can also be used for notifying the public to any hazardous material spills or other incidents.

In 2015 and again in 2018, the National Weather Service conducted “Skywarn” weather observer classes in Clarion County. In 2014 and 2017 National Weather Service also conducted an “Advance Skywarn” weather observer class. These spotters are very helpful in providing the NWS vital information, which in turn, helps to increase the warning times.

Commonwealth, County, municipalities and residents should mitigate the following before storm season begins:

- Trees – remove dead, damaged or diseased
- Structures - repair loose or damaged siding, roofing, doors or windows

C. Biological Hazards

1. Food-Borne Illnesses

The growing, production process and preparation of foods can lead to contamination causing illness. Federal and Commonwealth agencies have the primary responsibility for identifying, monitoring and handling these types of events in the County.

History/Vulnerability

There have been no reported incidents of contaminated food products produced or manufactured in the County. The County has been affected by products from other states and countries. The latest incidents were in fruit, milk, flour, cake mixes, lettuce, peanuts and peanut butter being contaminated. There have been no reported incidents in the County from food preparation.

Probability

These types of incidents will continue to occur. The probability is **low** for a major impact on the County.

Mitigation

Appropriate agencies will provide training programs for food growers, processors and preparers on food safety. Work with state and Federal agencies to identify and monitor incidents. Also, provide accurate public information.

2. Infectious/Communicable/Pandemic Diseases

Infectious diseases are caused by any organism, such as a virus, bacterium, fungus or parasite, that is capable of being communicated by invasion and multiplication in body tissues.

Communicable diseases are an illness which is capable of being spread to a susceptible host through the direct or indirect transmission of an infectious agent or its toxic product by an infected person, animal or arthropod, or through the inanimate environment.

Pandemic is defined as a disease affecting or attacking the population of an extensive region, including several countries, and/or continent(s). It is further described as extensively epidemic. Generally, pandemic diseases cause sudden, pervasive illness in all age groups on a global scale. Infectious diseases are also highly virulent but are not spread person-to-person.

Federal and Commonwealth agencies have the primary responsibility for identifying, monitoring and handling these types of events in the County.

History/Vulnerability

Human Disease: Three pandemic influenza outbreaks transpired during the 20th century in 1918, 1957 and 1968. The population of the County would be vulnerable to a pandemic causing virus due to lack of immunity and limited vaccine stockpiles. There have not been any reported cases of naturally occurring small pox globally since the 1970's. Any small pox outbreak would be an act of terrorism. Plague is not endemic to Pennsylvania. SARS has not been reported in this area.

Infectious/Communicable Diseases that have impacted or currently impacting the County include AIDS, chickenpox, hepatitis, influenza, Lyme, measles, mumps, pertussis, rabies and tuberculosis.

Lyme Disease is a bacterial infection primarily transmitted by ticks. There have been reported incidents involving humans. In Clarion County (as per Department of Health, 1/19), the following have been reported:

2016: 206 cases

2015: 115 cases

2014: 101 cases

2013: 98 cases

Zika Virus has **not** been found in mosquitoes in the County. There are no reported incidents involving humans.

West Nile Virus has been found in mosquitoes in the County. There are no reported incidents involving humans.

There were outbreaks of Pertussis in 2015 and 2018 and NORO Virus in 2015.

In 2009 there was a pandemic of the H1N1 virus.

White powder incidents have been on the decline. Clarion County has approximately 1 or 2 white powdery substance calls a year. All of the incidents to date have been nonhazardous materials.

Probability

The probability of a pandemic event affecting the County is currently **low**.

Although the probability of Clarion County being the target of a direct domestic terrorist attack is greater than it being the direct target of an international terrorist attack, it should be equally prepared for both. It is hard to determine at this point what the actual probability of a terrorist attack occurring within the County is.

The probability of Lyme disease occurring in the County is **very high**.

The probability of West Nile Virus occurring in the County in mosquitoes is high and in humans is **low**.

The probability of Zika Virus occurring in the County in mosquitoes is low and in humans is **low**.

Mitigation

Partner with the Pennsylvania Department of Health for the following:

- Monitor the health status to identify community health problems
- Identify health problems and health hazards within the community
- Partner to inform, educate and empower people about health issues
- Mobilize community partnerships to identify and solve health problems
- Develop policies and plans to support individual and community health efforts
- Enforce laws and regulations that protect health and ensure safety
- Link people to needed personal health services
- Assure a competent public health and personal healthcare workforce
- Evaluate effectiveness, accessibility and quality of personal and population based health services
- Research for new insights and innovative solutions to health problems
- Provide public information materials

For pandemic influenza:

Continue pandemic influenza planning with key stakeholders. Continue to plan and train for terrorist attacks involving biological/chemical weapons. Work with federal and Commonwealth agencies to provide information for responders, business/industry and the public.

For Lyme disease:

Clarion County to coordinate with the Department of Health to provide public education programs.

For the threat of West Nile Virus (WNV):

The Clarion County Conservation District (CCCD) implements a yearly mosquito based integrated pest management program (IPM). This program is funded through a Pennsylvania Department of Environmental Protection grant and is carried out by a County WNV technician with technical support from a Pennsylvania Department of Environmental Protection Vector Management Biologist.

The CCCD IPM program has several components:

a. Public Education

Includes outreach to citizens regarding such topics as personal protection from adult mosquito bites, elimination of mosquito breeding sites around homes and property, WNV disease symptoms, etc. This component also includes outreach to inform citizens of the existence of the CCCD WNV program and a contact for mosquito complaints or concerns.

b. Source Reduction

Eliminate mosquito breeding sites throughout Clarion County on public and private property. This is typically accomplished through the elimination of standing water.

c. Surveillance

Seasonal surveillance of both larval and adult mosquito populations throughout Clarion County including virus isolation testing on adult mosquito species known to be potential carriers of WNV. Adult mosquito surveillance is accomplished through several trapping methods conducted in and around areas of documented mosquito production or in response to citizen complaints. Typically the CCCD utilizes at least 15 - 20 adult mosquito traps per week during the mosquito breeding season (April 1st - October 15th). Larval and adult mosquito surveillance locations can and do vary throughout a typical season with an ultimate goal of providing "coverage" in every municipality within Clarion County.

d. Control

Conduct larval mosquito control of known mosquito breeding sites throughout the County. Biological larvicides are typically used for effective larval control. Adult mosquito control is conducted when collections surpass CCCD control matrix threshold numbers. The adult mosquito control threshold is variable and depends on such factors as seasonality, documented virus activity, species distribution, human populations, and ultimately weather conditions. Synthetic pyrethroids (Permethrin, Sumithrin, and Resmethrin) are used to control adult mosquitoes using either low volume (LV) backpack applied barrier applications, or ultra-low volume (ULV) truck mounted applications. Frequency of adult applications varies from year to year.

3. **Animal or Insect Infestation or Damage**

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.

Federal and state agencies have the primary responsibility for identifying, monitoring and handling these types of events in the County.

History/Vulnerability

We are vulnerable to this type of event. The following are either currently effecting or have affected Clarion County:

Insects and Other Invertebrates: Japanese Beetles, Gypsy Moth, Emerald Ash Beetle, Ahemlock Wooly Adelgid and Siren Wood Wasp

Animal Pathogens: Ticks (Lyme Disease), Deer (Chronic Wasting Disease)
Mosquitoes (West Nile Virus and Zika Virus),
Raccoon, Bat, Fox (Rabies)

Fishes and Invertebrates: Zebra Mussel and Round Gobe

Probability

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. The probability to this type of event is **high**.

Mitigation

Continue monitoring by Federal and Commonwealth agencies. Assist Federal and Commonwealth agencies with programs.

D. Accidental Human Caused

1. Building/Structure Collapse

Collapse of structures can be caused by different events (i.e. explosion, strong winds, flooding, heavy snows, subsidence, fires, structural problems (disrepair), etc.).

History/Vulnerability

The County has seen different types of collapsed structures over the last ten years. Most were caused by fires with some from strong winds, heavy snows, flooding, disrepair, structurally deficient and explosions. There have been small to moderate sized bridges that have collapsed from flooding and/or structural issues. Aging culvert and cross pipes remain an issue throughout the County. (For specifics see history under other hazards.)

Probability

With the County vulnerable to both man and natural caused events, collapses will occur. The frequency of collapsed structures occurring in the County is expected to remain **low**.

Mitigation

Through enforcement of building and flood plain codes, maintenance/repair of bridges and culverts these events should decrease. Municipalities shall identify structures that are unsafe and require that they be repaired or demolished. Continue training for emergency responders to identify unsafe structures and conditions. Train and equip emergency personnel for response to structural collapses.

2. Entrapment

Entrapment can come in many forms in Clarion County. Most entrapments are caused by traffic accidents. There has been some from industrial accidents, farming accidents, structure fires, weather related incidents and home accidents.

History/Vulnerability

There is a history of all the above in Clarion County. The County is highly vulnerable to these types of events. There was 1 fatal industrial incident in 2017 involving a worker entrapped in equipment.

Probability

The probability of this type of event is **high**.

Mitigation

Ensure all first responders have appropriate training. Connect with surrounding counties for trained specialty teams (i.e. confined space, high angle, etc.).

3. **Explosion/Fire**

Explosions with/without fire are rare in the County. These could be caused by gas leaks (natural or propane), wells (gas and oil), chemicals (i.e. drug labs) or explosive devices.

History/Vulnerability

Four incidents in the last five years were caused by gas leaks.

2018: there was 1 explosion

2017: there was 1 explosion

2016: there were 11 explosions

2015: there were 6 explosions

2014: there were 2 explosions

In November 2015, there was a garage explosion in Redbank Township attributed to methane gas, October 2015 there was a house explosion in Clarion Township attributed to natural gas, March of 2006, there was a house explosion in Clarion Borough that was attributed to a natural gas leak. In October of 2004, there was a residence that exploded in Porter Township. This explosion was attributed to natural gas that possibly seeped into the basement. There was 1 fatality and 2 others injured in all these incidents.

Probability

The probability of these types of events is **low**, however; the County has had incidents involving all types of leaks, chemicals and explosives. The potential was there for these incidents to have escalated.

Mitigation

Continue public and emergency responder education on awareness to these types of events.

4. **Fuel/Resource Shortage**

Fuel shortages can be both fast developing local shortages, those caused by an oil embargo, or creeping shortages caused by rising costs of fuels.

Fuel shortages can also be caused by localized imbalances in supply. Strikes, disasters and severe weather can disrupt fuel movements and cause local shortages.

History/Vulnerability

Over the last ten years there have been no wide spread fuel shortages. Some local stations have run out of fuel because of weather issues.

Probability

The United States receives oil from foreign countries; this has affected fuel capacities before and may in the future. The probability of this type of event is **low**.

Mitigation

Work with local distributors and dealers to maintain fuel capacities during disasters and ensure supplies for emergency personnel.

5. Hazardous Materials Spill or Release

There are large amounts of chemicals, oils, radioactive materials, and other hazardous materials located in or transported through Clarion County daily.

History/Vulnerability

There have been highway spills and releases from truck accidents in the past; however, the potential for accidents involving fuel oils, propane gas, radioactive medical supplies, gasoline and other toxic and dangerous liquids/gases remains high. The following are incidents totals in the County:

2018: there were 6 incidents

2017: there were 6 incidents

2016: there were 5 incidents

2015: there were 5 incidents

2014: there were 8 incidents

To date, there have been no hazardous materials releases from fixed facilities that would require notification under SARA Title III.

In 2004 Clarion County law enforcement agencies started to experience incidents involving clandestine drug labs. There has been clandestine drug lab bust conducted within Clarion County. Pennsylvania State Police have a team that now handles clandestine drug labs. The following are reported drug lab incidents totals in the County:

2018: there were 4 incidents

2017: there were 6 incidents

2016: there were 14 incidents

2015: there were 10 incidents

2014: there were 8 incidents

Natural gas incidents involving leaks, accidents, and line ruptures are common.

Transmission lines are old. The following are reported gas incidents totals in the County:

2018: there were 38 incidents

2017: there were 53 incidents

2016: there were 31 incidents

2015: there were 39 incidents

2014: there were 38 incidents

Probability

The probability of a hazardous material event is **high**.

The County has over 648 miles of State and Federal roads. The major transportation network in the County includes Interstate 80, US Route 322, and State Routes 28, 66, 68, and 208. All of these routes carry extremely heavy truck traffic and are a constant potential scene of a hazardous materials incident.

Currently, Clarion County has 17 SARA facilities and 4 SARA sites located in surrounding counties that have an impact on the County. There are also 120 other locations in Clarion County reporting chemicals to Pennsylvania Department of Labor and Industry.

Drug Manufacturing Labs are in the County.

There are many oil/natural gas wells and pipelines throughout the County. There also is one underground natural gas storage facility. With the increase in deep gas drilling, there is an increase in new pipelines within the County.

When the cost of gasoline and fuel oil increase, some residents are making their own bio-fuel. This requires chemicals, different types of oils (cooking, vegetable, etc.) and other materials. To date these locations have been in rural areas. We had an incident in 2011 at a farm where the individual was making his own bio-fuel; there was a fire and spill of cooking oil.

Clarion County has one public airport serving general aviation. No commercial flights occur to the airport. There have been no reported hazardous spills.

Air/Water Pollution, Contamination

Pollution is the introduction of contaminants into an environment that causes instability, disorder, harm or discomfort to the ecosystem. Contamination is the presence of hazardous materials or blood borne pathogens on locations, people, animals and equipment where it is not normally found.

History/Vulnerability

There have been highway spills and gas releases from truck accidents in the past; however, the potential for accidents involving fuel oils, propane gas, radioactive medical supplies, gasoline and other toxic and dangerous liquids/gases remain high.

There have been transportation incidents in the County that have led to pollution and/or contamination. These are reported incidents:

2018: 1 causing water pollution and 6 involving ground contamination

2017: 1 causing water pollution and 5 involving ground contamination

2016: 2 causing water pollution and 4 involving ground contamination

2015: 1 causing water pollution and 5 involving ground contamination

2014: 2 causing water pollution and 6 involving ground contamination

To date, there have been no hazardous materials releases from fixed facilities that would require notification under SARA Title III.

Since 2012 there have been 6 leaks from oil wells that caused ground contamination, 6 leaks that caused water pollution, and 7 leaks from gas wells that caused air pollution.

Probability

The probability of air/water pollution or a contamination event is **high**. Clarion County is in the Central Allegheny River Basin, as designated in the Commonwealth Water Plan. This includes the Allegheny and Clarion Rivers including their many tributaries.

The County has over 648 miles of State and Federal roads. All of these routes carry extremely heavy truck traffic and are a constant potential scene of a hazardous materials incident.

Currently Clarion County has seventeen (17) SARA reporting facilities and plans approved by the Local Emergency Planning Committee (LEPC). There has been an increase in Drug Manufacturing Labs in the County over the past couple of years.

There are many oil/natural gas wells and pipelines throughout the County.

Clarion County has one public airport serving general aviation. No commercial flights occur to the airport. No reports of hazardous materials spills.

There was a great demand for extracting natural gas from the Marcellus/Utica shale formations. This requires both vertical and horizontal drilling, combined with a process known as 'hydraulic fracturing.' These well sites have many hazards including chemicals, radioactive materials and explosives. After the well is drilled, drillers pump large amounts of water mixed with sand and other chemicals into the shale formation under high pressure to fracture the shale around the well. The amount of water typically required for hydraulic fracturing ranges from about one million gallons for a vertical well to approximately five million gallons for a vertical well with a horizontal lateral. This used water creates issues in that the water contains contaminants such as brine, radioactive materials and other chemicals.

Mitigation

The Clarion County Local Emergency Planning Committee (LEPC) updated the Commodity Flow Analysis in 2015. This project was completed by an independent agency.

The Clarion County LEPC has determined that a 0.3-mile vulnerability zone will be used for planning of these transportation concerns since the chemical or quantities involved is unknown. This is consistent with guidance provided by the DOT Emergency Response Guidebook. No hazardous transportation statistics are available.

Existing Response Capability for Hazardous Materials

Hazardous Materials Team

McCutcheon Enterprises Inc. of Apollo, PA is the current contracted Clarion County HazMat Response Team, Act 165 Certified.

Equipment/Supplies

Clarion County has 3 HazMat Response Trailers. These units will give the fire and EMA staff the capability of responding to an incident with containment material/equipment, personal protective equipment, detection/identification equipment and communications. There is a sufficient amount of absorbent material for a moderate size (vehicle accident) hydrocarbon spill, but there is still a shortage of hazardous chemical absorbent and containment materials available in the County.

There are limited quantities of diking materials available within Clarion County. Penn DOT is the primary source of the material.

Personnel/Training

Now, most of the active fire and EMS providers in Clarion County are trained to the HazMat Recognition and Identification Awareness or HazMat Operations level.

Clarion County DPS responds to HazMat incidents, when requested, and evaluates the situation to determine appropriate HazMat response (additional equipment, manpower, or certified HazMat Team).

Planning

Currently there are seventeen (17) SARA facility plans, all plans have been approved by the Clarion County Local Emergency Planning Committee. The annual review and update of these plans will be approved by the LEPC during the review of this Hazardous Materials Emergency Response Preparedness Assessment. All seventeen plans have been submitted to the Pennsylvania Emergency Management Agency, Western Region Office.

6. Radiological Incident

Radiological incidents can occur in Clarion County. Radiological materials are used and transported daily by the hospital, cancer center, industrial and construction companies.

History/Vulnerability

There have been no reported incidents to the County.

Clarion County is vulnerable to radiological incidents from the hospital, cancer center, industry and construction companies using radiological materials.

Well drilling also produce a radiological sludge during drilling and fracking. Wells are still being drilled in Clarion County.

With 27.9 miles of interstate highway, 620 miles of Federal and state highways in Clarion County, there is a possibility of a radiological transportation incident.

Probability

With facilities and transportation routes in Clarion County, there is a **low** probability of a radiological incident.

Mitigation

Encourage training for first responders and maintain radiological monitoring equipment for incident response.

7. Transportation Incident

A transportation accident is an incident involving highway, air or rail transport. A disaster may be defined as an accident resulting in death, serious injury, or extensive property loss or damage.

History/ Vulnerability

Highway Transportation Accidents

Clarion County has one interstate highway, producing heavy traffic flow. Traffic estimates on Interstate 80 are approximately 20,000 vehicles per day of which 9,000 are trucks with 465 of them are carrying placard hazardous materials. Numerous state routes provide intra-county and inter-county traffic flows.

On January 7, 2015 there was a major accident on Interstate 80 westbound at mile marker 65. The accident involved 9 tractor trailer trucks and 10 other vehicles and occurred during whiteout snow conditions. This accident caused injuries to 24 people with 2 fatalities. Interstate 80 westbound was closed for over 12 hours causing congestion on alternate routes. In 2016 the Commonwealth increased the speed limit on Interstate 80 to 70 mph.

A summary of reportable traffic accidents for 2014 - 2018 follows:

Year	Crashes	Fatalities	Injuries
2018	Not available	8	Not available
2017	392	7	182
2016	417	4	173
2015	432	6	204
2014	451	5	227

The Pennsylvania Department of Transportation reports that the 5-year estimated traffic growth for Clarion County is 1.5 percent.

There are 27.9 miles of interstate highway, 620 miles of Federal and state highways, and 659 miles of paved municipal and secondary roads in Clarion County.

The sections of highway within Clarion County where accidents are most likely to occur are:

- Interstate 80
- PA Rt. 68 (South Fifth Avenue), one-half mile West of Clarion
- PA Rt. 66, one mile South of Clarion (Stone House Road)
- Intersection of Exit 62 of I-80 and PA Rt. 68 due to massive traffic congestion
- Intersection of Exit 64 of I-80 due to poor visibility
- US Rt. 322, one and one-half miles East of Clarion (Bull Barn Turn)

In 2018 there were 65 road closure incidents, 2017 there were 45 road closure incidents and 2016 there were 36 road closure incidents, caused by traffic accidents, trees down, fires or wires across the road.

With highway accidents, there is an added vulnerability that stems from the age and upkeep of bridges throughout the Commonwealth. Per the Pennsylvania Department of Transportation, for Clarion County there are 208 total bridges with 15 listed in structurally poor condition (as of 1/2/2019).

Air Transportation Accidents

Clarion County has one general aviation airport within its boundaries. However, because of the Clarion Omni, a major airway out of Greater Pittsburgh International Airport is directly over the County. This places approximately 50 commercial flights a day over the County. Clarion County has 2 air medical helicopters.

According to the Clarion County Airport, the last reported aviation accident occurred on September 20, 2014, a Challenger LSA single engine aircraft crashed on takeoff. The pilot was severally injured and was Medevac'd to hospital.

On January 16, 1995, a Cessna 310 aircraft with an inoperative deicing system attempted an unscheduled landing at the Clarion County Airport with considerable ice on left wing. The aircrafts landing gear collapsed and the aircraft departed left side of runway. No fatalities were reported.

Since September 11, 2001, all airports have become more security conscience, and most general aviation airports have enacted some form of additional security. In addition, to

emphasis on employee education on security, the following measures are in effect at the Clarion Airport:

- ❖ Hangar doors are kept locked throughout the day, and only opened when aircrafts are to be removed.
- ❖ Security signs installed with 800-GA SECURE phone number.
- ❖ Regular drive-through patrols initiated by Pennsylvania State Police.

The Clarion County Airport has finalized an Airport Hazard Zoning Plan which addresses flight paths and height restrictions.

Probability

The probability of this type of event is **high**. Considering the transportation growth within the County, it can be assumed that transportation accidents may increase. Aircraft accidents should remain minor.

Mitigation -- Highway Transportation

In some areas of the County, the speed limits have been reduced from 55 mph to 45 mph or lower to limit the potential severity of accidents.

Pennsylvania Department of Transportation has also started safety projects on Route 36 and Interstate 80 with the placement of anti-skid material on the roadway. This will help with traction on these roadways.

By far, the most dangerous and frightening of highway accidents is an accident involving one or more school/touring buses. Therefore, every municipal police and fire company should have a special plan of action ready to implement in the event of such an accident. School districts should also teach their students how to react in the event of a bus accident. Basic first aid should also be taught to every student.

Mitigation -- Air Transportation

As described earlier, the greatest vulnerability for an air accident is near the airport. Also, with 2 air medical helicopters landing at various sites in the County that are not helipads accidents can happen. Therefore, those fire and rescue squads in the area should be trained to respond to such a potential accident and air medical helicopter landing procedures. Preparedness and training is the best tool in coping with any potential aviation accident.

8. Unavailability of Essential Employees

Employees are key for the operations of all businesses and industries in the County especially for critical facilities.

History/Vulnerability

There have been no incidents reported to the County. The County is vulnerable to this type of event. Labor disputes, pandemic events and the flu are primary ways not to have essential employees available.

Probability

The probability of this type of event is **low**.

Mitigation

Mitigation for this type of event include ensuring multiple employees are trained for key jobs and/or receive medications for flu and/or pandemic events.

9. Water Control Structure Failure

Any dam has the potential for creating a major disaster. Dam failures usually occur with little or no notice, wreaking havoc on an unsuspecting community. The worst dam failure in the nation occurred in Johnstown, Pa.

The National Dam Safety Program authorized the U.S. Corps of Engineers to undertake a national program of inspecting dams for the purpose of protecting human life and property. Dams covered under the program included all structures over 25 feet high impounding over 15 acre-feet of water. Structures less than six feet high were not included.

Dams in Pennsylvania have been classified by hazard potential as follows:

Class 1 Dams -- These are dams with potentially high hazard capabilities, should they fail. This would include dams which store a significant quantity of water located on either small streams or main stem rivers or dams higher than 10 feet located on the main stems. Most of these dams would have the potential of causing both life and property losses if they failed.

Class 2 Dams -- These are dams which have intermediate flood hazard potential if they fail. These dams store a sufficient quantity of water to cause property damage, but probably not loss of life in the event of failure.

Class 3 Dams -- These are dams which have low flood hazard potential if they fail. Most property losses, if any, would most likely occur in the reach just below the dam.

Class 4 Dam -- These are minor structures used to impound water for irrigation, water supply intakes, recreation, etc. The flood hazard potential is essentially nonexistent.

History/Vulnerability

There is no record of a dam failure occurring in Clarion County.

Class 1 and Class 2 dams would pose the greatest threat to downstream properties, should they fail.

Only 1 dam in the County falls under these classifications:

Piney Dam - An Emergency Action Plan exists, and is annually updated.

There are 4 dams located outside the County, but would impact the County, that fall under these classifications:

East Branch Dam – Elk County (Currently under major repair)

Kinzua Dam – Warren County

Tionesta Dam – Forest County

Two Mile Run – Venango County

An Emergency Action Plan exists for all 4 dams and are updated annually.

There are other smaller dams that would have an impact in the County. They are:
New Bethlehem Dam Clarion County
North Fork Dam Jefferson County

There are no dams in Clarion County currently regarded as unsafe.

Probability

The probability of this type of event is **low**. With continued maintenance of dams that impact the County, no failures should occur in the future.

Mitigation

Ways of preventing this type of disaster from happening mainly involve the enforcement of safety standards for dam construction and maintenance and the installation of an adequate warning system. The Army Corps of Engineers inspects all dams in the U.S. for the purpose of protecting lives and property. A Presidential Directive in 1978 accelerated the Corps efforts in Pennsylvania. The Commonwealth of Pennsylvania has also passed a Dam Safety Act which requires Commonwealth inspection and the rating, in categories, of each dam in the Commonwealth from most hazardous to least hazardous (Category 1 to Category 3).

One main issue with dam incidents is that the emergency classification terminology used for an incident is different based on dam owner. Currently there are three different sets of terms for dam incidents in Clarion County. Using different terminology makes it difficult for first responders and when notifying the public. FEMA and PEMA should work on trying to standardizing dam incident terminology.

10. Misinformation

Misinformation is false or inaccurate information that is spread unintentionally.

History/Vulnerability

There have been issues effecting Clarion University and some school districts where social media was providing inaccurate information on incidents that occurred and incidents that did not occur.

Probability

There is always a potential for this event to occur due to lack of correct information being provided and social media sites. The rural nature of the County cause issues with providing correct information in a timely manner. The probability of this type of event is **low**.

Mitigation

Develop a good public information system and educate the residents/visitors on that system. The County is currently working on systems to work with the broadcast media. These systems include but are not limited to social media sites, web sites, reverse telephone notification systems and outdoor public notification systems.

11. Oil & Gas Wells

Pennsylvania was the first place in the world where a commercially successful well was drilled for oil production. This well was just west of Clarion County in Venango County. 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 400,000 oil and gas wells have been drilled in the Commonwealth.

Current Wells

Gas and oil wells are still operational in the County. According to Pennsylvania Department of Environmental Protection there are 4,166 oil and gas wells in Clarion County. Interest in the gas located in the Marcellus/Utica shale formation has decreased in Clarion County over the last 2 years.

History

Today's wells are drilled vertical then horizontal. All oil wells are vertical and natural gas wells are vertical or vertical then horizontal.

With all of Clarion County having the Marcellus/Utica shale formation there was 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 in Clarion County involving wells including the following:

- Releases from well heads being struck
- Gas migrating into water wells (there was 1 incident reported 2015, 2016 and 2018)
- Gas migrating into structures
- There were 2 oil well incidents reported between 2014-2018
- There were 4 gas well incidents reported between 2014-2018

In May 2016, an oil well overflowed into a containment area in Monroe Township.

Vulnerability

Extracting natural gas from the Marcellus/Utica shale formations requires both vertical and horizontal drilling, combined with a process known as 'hydraulic fracturing.' To drill these wells requires 3-4 acres of land for roads and drilling pads. There are larger amounts of employees, equipment and supplies plus the drilling rigs that are much larger than standard well drilling rigs. These sites have many hazards including confined spaces, high angle drill rigs, chemicals, radioactive materials, explosives and high-pressure equipment. After the well is drilled, cased and cemented to protect groundwater and the escape of natural gas and other fluids, drillers pump large amounts of water mixed with sand and other fluids into the shale formation under high pressure to fracture the shale around the well, which allows the natural gas to flow freely to the well bore. The amount of water typically required for hydraulic fracturing ranges from about one million gallons for a vertical well to approximately five million gallons for a vertical well with a horizontal lateral. This used water creates issues in itself in that the water contains contaminants such as brine, radioactive materials and other chemicals. Also, Clarion County has many deep underground coal mines that are not mapped. These can lead to issues in the well drilling process.

The table below (Pennsylvania Department of Environmental Protection website) shows permits issued and wells drilled for various types of wells. While the wells drilled are lower than permits provide, this may change once the infrastructure is built to move the gas from wells to distribution. Currently there is no/limited infrastructure in northern Clarion County to move gas from Marcellus/Utica wells, gas companies have been plugging those wells.

Gas and Oil Wells		
Year	Permits	Drilled
2018	1	1
2017	3	2
2016	2	1
2015	1	1
2014	11	5
Unconventional Gas Wells		
Year	Permits	Drilled
2018	6	1
2017	9	4
2016	3	2
2015	10	3
2014	5	0

Probability

If drilling activities increase the potential for incidents will increase. The occurrence of this event is **medium**, however; the potential for a large-scale event is present.

Mitigation

Obtain information on well location, access road location, address the locations and place in dispatch maps. Work with Commonwealth agencies, companies and local officials/responders to identify and address possible incident scenarios. Coordinate with Commonwealth agencies and gas companies to provide training for emergency response agencies. Ensure good public information system.

Orphaned/Abandon Wells

Prior 1985 gas and oil wells were not registered in Pennsylvania, leaving many old wells not properly plugged when abandoned.

History/ Vulnerability

Since 1956 has the Commonwealth been permitting new drilling, but not until 1985 were oil and gas operators required to register old wells.

An unplugged abandoned well can be a hazard to the health and safety of people living near it, or it can cause pollution. For example, a rusted-out casing in a gas well can let natural gas flow underground and accumulate in the basement of a nearby building, with explosive consequences. Occasionally, gas leaking from an old well contaminates nearby water well.

An old well might be a conduit for salt brine from deeper formations to pollute fresh ground water, or to discharge at the surface. In some cases, oil leaks from abandoned wells, polluting soil and water.

In the vicinity of a coal mine, an old well can be a conduit for explosive gas to enter the mine a serious mine safety problem. Where coal mining has occurred, an old well can allow acidic mine water to discharge at the surface.

In Clarion County, there are approximately 194 orphaned wells, 58 abandon wells

identified (as per Pennsylvania Department of Environmental Protection 1/2019) and likely many more not yet identified.

Probability

The frequency of incidents involving unplugged abandoned wells occurring in the County expects to remain **low**. However, considering the numerous orphaned/abandoned wells located within the County, explosions or pollution resulting from the wells cannot be ruled out.

Mitigation

Because abandoned wells can cause many problems, the Oil and Gas Act of 1984 requires oil and gas well operators to plug non-producing wells.

Some gas wells are drilled to depths of 5,000 feet and deeper. Oil wells are usually shallower; many are less than 1,000 feet deep. Clarion County has shallow oil as shallow as 550' but typically between 900' to 1200'. Generally, to properly plug a well, all of the pipe should be removed and the well bore cleaned out. Then the well bore must be filled with a non-porous material. In crucial portions of the well, such as coal seams, oil and gas formations and fresh groundwater aquifers, a cement plug is needed to seal off those zones from each other. The result will be a "plug" which prevents gas or liquids from entering or flowing in the well bore. Cement is used only across formation bearing or having bourne oil, gas or water below the surface casing seat, and then a cement plug is set at the bottom of the surface casing seat. Then depending if coal or noncoal, the well is "topholed" with noncementing material if it is a noncoal well, or a vent is installed if it is a coal well.

In 1992, the Legislature amended the Oil and Gas Act to allow certain oil or gas wells abandoned before April 1985 to be classified as "orphan" wells. That amendment also gave DEP the authority to plug orphan wells and created a modest means of funding this work. Landowners, leaseholders and oil and gas operators are thus relieved from the responsibility to plug orphan wells on their properties (if they received no "economic benefit" from the well after April 1979).

DEP's Bureau of Oil and Gas Management runs the Orphan Well Program to locate and plug orphan wells. The Orphan Well Plugging Fund is a separate account in the Commonwealth treasury which provides money for the Orphan Well Program. The money in this fund comes from surcharges on permit application fees for new oil and gas wells. Taxpayers do not finance the Orphan Well Plugging Fund; the oil and gas industry does.

The average plugging cost is \$15,600 per oil well and \$53,700 per gas well.

E. Intentional Human Caused

1. Structure Fire

Many fires have the potential for disaster or extensive loss of property and death. There are a few factors which may influence the probability or likelihood that a fire may develop into a disaster. Based on historical record, our own experiences and an examination of the circumstances surrounding various situations, we can improve our understanding of fire hazards that may lead to disaster.

History/Vulnerability

Most fire disasters are averted by early warning and appropriate response. Even though only a small portion of these incidents resulted in significant property damage and even fewer in personal injury or death, a larger portion could have resulted in disaster had the emergency response not been timely and effective. Since 1994, there have been 21 deaths as the result of sixteen fatality-involved fires in Clarion County. The most recent fatality occurred in 2018.

In 2002, New Bethlehem Borough was affected by a large structure fire. Four businesses were destroyed, and two businesses had minor water and smoke damage. 30 fire departments responded to the incident. No injuries or deaths were reported.

A summary of fires follows:

2018: There were 113 reported structure fires

2017: There were 160 reported structure fires

2016: There were 131 reported structure fires.

2015: There were 121 reported structure fires.

2014: There were 98 reported structure fires.

Vulnerability

The vulnerability of persons and property to fire depends on a few factors, such as the structural materials used in the facility, the contents stored in the facility, the response time by fire companies, and any lack of fire warning. Clarion County's volunteer fire companies generally have an adequate level of training.

Within the past few years, many of the County's fire companies have entered into automatic mutual aid agreements with their neighboring companies, thereby increasing the equipment and manpower responding to incidents, especially during week days from 6 am to 6 pm.

Probability

Although comprehensive fire figures are not available, it is safe to say that the number of major fires in Clarion County has remained constant. However, the number of smaller fires and fire related deaths remain **low**. It is expected that with expanded prevention programs, early detection via smoke detectors and better fire department training, this trend will continue.

Mitigation

Public education and regulations are the two best methods for preventing the start of any fire. Along with locally available training programs, continued mutual aid agreements and preparation by the local firefighting agencies, the devastating effects of a fire can be reduced. Another mitigation measure is water supply. Expansion of public water systems will add additional fire hydrants. Adequate fire insurance coverage rounds out the range of fire mitigation measures.

2. Bomb Threat

Bomb threats are common around the country.

History/Vulnerability

Bomb threats have been a source of problems in the past, and probably will continue to be problematic. **Most bomb threats are not reported to the County. Bomb threats not**

reported leave the County vulnerable, appropriate emergency response agencies are not ready to respond in the event of a confirmed bomb or detonation.

- 2018:** Bomb threats at schools. Email threats sent across the Commonwealth and Clarion County to banks, companies, schools and residents. Incidents handled by local police and/or PSP.
- 2017:** Bomb threats at schools. Incidents handled by local police and/or PSP.
- 2016:** Bomb threat at a school. Incident handled by local police and/or PSP.
- 2015:** No report bomb threats to the County.
- 2014:** Bomb threat at a high school. Incident handled by local police and/or PSP.

Probability

The probability of this type of event is **low**. Bomb threats will continue to be problematic especially with schools.

Mitigation

Request all bomb threats are reported to the County.

Monitor current local conditions that may increase the potential for this type of event. Increase information exchange between all public safety agencies.

3. Demonstration/Civil Disturbance/Riot/Insurrection

A civil disorder is any incident that intend to disrupt community affairs, threatens the health and safety of the population, and may cause the destruction of property. Insurrection is an organized armed rebellion against an established government or civil authority.

History/Vulnerability

Riots are generally not a current problem in Clarion County. Civil disorder on the other hand have been a source of problems in the past, and probably will continue to be problematic.

The following lists are incidents that **were reported** to Clarion County 9-1-1:

- 2018:** Nothing reported to the County.
- 2017:** Nothing reported to the County.
- 2016:** Threat made to health care facility. Incident handled by PSP.
- 2015:** Nothing reported to the County.
- 2014:** Reported gun at an elementary school. The incident was handled by PSP.
- 2013:** Armed man outside school building. Incident handled by local police, PSP and sheriff deputies.

There have been no reported incidents of insurrection in the last ten years. According to law enforcement officials, there are some active antigovernment groups in the County.

Probability

The probability of this type of event is **low**. Civil disorder events may occur depending on current community or national issues (i.e. special events, sport events, political problems, etc.).

County wide there are known individuals that do not recognize any form of government as their own (sovereign citizens). While these citizens are small in number they do exist. During the past two years, law enforcement agencies have had direct dealings with

these individuals about criminal and/or civil incidents. While they have never resisted authority they commonly express their opinion as to our authority and police powers.

Mitigation

Monitor current local conditions that may increase the potential for this type of event. Increase information exchange between all public safety agencies. Law enforcement agencies will monitor groups.

4. Discrimination/Harassment **Discrimination**

Discrimination involves treating someone less favorably because of their possession of an attribute (e.g., sex, age, race, religion, family status, national origin, military status, sexual orientation, disability, body size/shape), compared with someone without that attribute in the same circumstances.

History/Vulnerability

There have been no reported incidents in the last ten years that required legal action.

Probability

The probability of this type of event is **medium**.

Mitigation

Continue to provide public information and education programs as well as enforcement activities to help control incidents.

Harassment

There are various types of harassment, bullying, psychological, racial, sexual, stalking, mobbing and hazing.

History/Vulnerability

From the view point of law enforcement, the crime of harassment has changed dramatically over the past five years. The typical person now has access to and uses a cell phone, laptop, or notebook. These devices vary in capabilities but will generally allow multiple ways for people to interact. This interaction could be directly or indirectly depending on the person's knowledge or ability. This technology is not specific to age, gender, race, etc. It is common place for each member of a family to have one or more of these devices for their own use. With this fact, law enforcement routinely deals with the crime of harassment through the "normal" avenue (kicking, punching, etc.) but now must deal with this crime through technology. Juveniles and/or students routinely will "harass" each other by what they write or post to a public or personal site (cyber bullying).

During the past two years five incidents of harassment in connection with the use of technology were investigated. These investigations are and will continue to be difficult to investigate and prove in order to make an arrest. This is and will be an area of concern due to the ever-increasing use of technology and its capabilities.

The school districts have reported the following incidents for school year 2016/2017: 8 cases of harassment (1 cyber) and 26 cases of bullying, all were handled by the school districts.

Public Safety Answering Points (9-1-1 Centers) are receiving calls from malicious actor(s) reporting fake emergency situations at a target's address, which triggers an emergency response. This is known as SWATting because the event may require the dispatch of a SWAT team.

In recent years, doxing has become an issue. Doxing involves a malicious actor collecting and releasing a target's personal information, which may include the target's home address, telephone number, email address, social security number, date of birth and family information.

Probability

The probability of this type of event occurring is **high** especially with the increased use of the internet and cell phones. Almost all of these events involve at least 2 people. However there could be events involving larger groups.

Mitigation

Schools and law enforcement agencies should continue to provide public information and education programs as well as enforcement activities to help control incidents.

Some of the Clarion County School Districts have added security/law enforcement staff at their schools. The following is a list of school districts and their security/law enforcement coverage:

A-C Valley – School police officers, PSP and Clarion County Sheriffs' deputies stop by schools during routine patrols.

Clarion Area – Clarion Borough Police stop at schools during routine patrols

C-L Area – Clarion County Sheriffs' Office Deputy at schools

Keystone – Knox Borough, PSP and Clarion County Sheriffs' deputies stop by schools during routine patrols.

North Clarion County – PSP and Clarion County Sheriffs' deputies stop by schools during routine patrols.

Redbank Valley – Private security company at schools

Union – School police officers at schools

Pennsylvania State Police offer programs on bullying.

Clarion County Schools should continue to participate or start participating in the following programs:

The Pennsylvania Youth Survey is done every two years and taken voluntarily by students in 6, 8, 10 & 12th grades in participating school districts. Students take the survey on the condition of it being completely anonymous. The survey identifies issues facing students (some areas include drugs, alcohol and bullying). This information is then used to identify programs to help the students to deal with these issues. Below are some of the programs:

The Clarion County Youth Council is a County wide program open to selected students from 8th-12th grade. All seven County school districts participated during school year 2018/2019. Each school has a small group of students who attend each of the three meetings held during the school year. These students learn valuable problem solving skills as well as leadership and working together. Students use information provided to them at

the meetings, through their administration or the PA Youth Survey to choose topics that are relevant to them and work towards bringing awareness or prevention to problem topics in their schools or communities. These topics range from bullying, hunger issues, drug and alcohol topics, safe driving, cancer, mental health and community fundraising. Research has shown the students often listen quicker to their peers than to adults. Ultimately, this program seeks to teach students the value of positive leadership and making a positive difference in their school and community.

The Promoting Alternative Thinking Strategies (PATHS) Curriculum is a program for educators and school staff designed to facilitate the development of self-control, positive self-esteem, emotional awareness and interpersonal problem-solving skills. PATHS has been used, researched, and found effective with classrooms of students as a prevention program or with a specific target population such as special needs students as an intervention program. The purposes of the PATHS Curriculum are to enhance social and emotional competence and understanding in children, as well as develop a caring, prosocial context that facilitates educational processes in the classroom.

The PATHS program has been shown to reduce students exhibiting aggressive behavior and depression/sadness among special-needs students. Reports also have shown increases in the following areas, students exhibiting self-control, pro-social peer relations, students' scores on cognitive skills tests, students' vocabulary for emotions, ability to use effective conflict resolution strategies. Currently 2 school districts are presenting the PATHS program.

Olweus Bullying Prevention Program is a universal intervention for the reduction and prevention of bully/victim problems. The universal program targets students in elementary, middle, and junior high school and school staff has the primary responsibility for the introduction and implementation of the program. Core components of the program are implemented on three levels:

- School-wide components include the administration of an anonymous questionnaire to assess the nature and prevalence of bullying at each school, a school conference day to discuss bullying at school and plan interventions, formation of a Bullying Prevention Coordinating Committee to coordinate all aspects of school's program, and increased supervision of students at "hot spots" for bullying.
- Classroom components include the establishment and enforcement of class rules against bullying and holding regular class meetings with students.
- Individual components include interventions with children identified as bullies and victims, and discussions with parents of involved students. Teachers may be assisted in these efforts by counselors and school-based mental health professionals.

The Olweus Bullying Prevention Program has been shown to result in reductions in bullying, victimization, and antisocial behavior such as vandalism, fighting, theft and truancy. It has also been proven to improve the "social climate" of classrooms, as reflected in students' reports of improved order and discipline, more positive social relationships, and a more positive attitude toward schoolwork and school. The Olweus Bullying program is being used in two county school districts.

"Safe2Say Something" (S2SS) Anonymous Reporting System is a life-saving and life-changing school safety program that teaches students, educators and administrators how

(1) to recognize the signs and signals of individuals who may be at risk of hurting themselves or others and (2) to anonymously report this information through the S2SS app, website or 24/7 Crisis Center Hotline. **This system went into effect January 14, 2019.** Schools should continue programs already in place and work with Human Service agencies to provide new programs.

5. Disinformation

Disinformation is false or inaccurate information that is spread deliberately.

History/Vulnerability

There is no history of this type of event occurring in the County in the last ten years.

Probability

There is a **low** probability for this type of event.

Mitigation

Monitor information being provide and provide correct information. Develop a good public information system and educate the residents/visitors on that system. The County is currently working on systems to work with the broadcast media. These systems include but are not limited to web sites, reverse telephone notification systems and outdoor public notification systems.

6. Kidnapping/Hostage

Kidnapping involves the abduction of a person by force or fraud to extract ransom, parental kidnapping, or interference with parental rights (taking an underage minor by another adult). Hostage is a person or persons held as security for fulfillment of conditions, terms or promises by another.

In the last few years human trafficking has come forward as a major issue across the United States. It mainly involves young girls and women (82% of cases with 30% being minors, source National Human Trafficking Hotline) being both kidnapped and held hostage as sex slaves, escorts and forced labor.

Human trafficking is a hidden crime as victims rarely come forward to seek help because of language barriers, fear of the traffickers, and/or fear of law enforcement.

Traffickers use force, fraud, or coercion to lure their victims and force them into labor or commercial sexual exploitation. They look for people who are susceptible for a variety of reasons, including psychological or emotional vulnerability, economic hardship, lack of a social safety net, natural disasters, or political instability. The trauma caused by the traffickers can be so great that many may not identify themselves as victims or ask for help, even in highly public settings.

History/Vulnerability

Kidnapping and hostage incidents have occurred in the County. Most kidnapping/hostage events are of the parental nature or someone interfering with parental custody.

There are reports of human trafficking occurring in Clarion County. With Interstate 80 and the 6 interchanges and other major roadways across the County there has been movement of these victims by their captors.

Probability

There is a **medium** probability for this type of event.

Mitigation

Setup a Human Trafficking Task Force in Clarion County to coordinate training/education programs, public information materials and responds to human trafficking incidents. Task Force should include Human Services Agencies, law enforcement, District Attorney, EMS, health care facilities, Clarion University, Clarion County schools, PennDOT, elected officials, 9-1-1 and EMA at a minimum.

Work with Clarion County schools to provide information (handouts, posters, etc.) and programs for students, staff and parents.

Provide public information and education programs for general public, Clarion University, law enforcement, EMS personnel, health care facilities, fire departments, hotels and camp grounds, restaurants and businesses as a minimum.

Work with hotels and motels, camp grounds, health care facilities, restaurants, etc. to post information for victims of trafficking to give them an escape route.

Identify safe houses to place victims and resources to provide health care, counseling, legal aid and advocacy.

7. Missing Person

In Clarion County missing person(s) events include runaway and lost children, elderly, persons with medical issues, hunters, hikers or boaters.

History/Vulnerability

There has been many of these types of events. The County has a large area for outdoor recreation activities. Outdoor areas include Cook Forest State Park, Allegheny National Forest, Clarion River, Allegheny River, State Game Lands and many campgrounds. Also, the County also has many miles of hiking, biking, horse riding and ATV trails. There are many festivals, 5-K races, duathlons, half-marathons, bike rides, concerts, reenactments, airshows and local fairs.

Probability

There is a **high** probability for this type of event.

Mitigation

Public safety agencies should train and exercise on ground and water search/rescue.

Public safety agencies should continue to provide public information and education programs.

Work with Commonwealth agencies, Federal agencies, camp grounds, special event sponsors and outdoor recreation businesses to provide educational materials to the public.

The Clarion County Sheriff Office has started the Project Lifesaver Program. This program places a transmitter on residents who might wander away from home or care giver because of conditions like Autism, Down Syndrome, Alzheimer's, etc.

8. Cyber Security Incidents

Cyber security incidents can be anything from a “virus” to outside sources accessing data from any computer system via the internet; to disrupting any or all services provided to the public. Adding to the problem is that the public and private sectors are relatively ignorant of just how much their life depends on computers as well as the vulnerability of those computers.

Cyber incidents can be defined as activities intended to damage or disrupt vital computer systems. These acts can range from taking control of a host website to using networked resources to directly cause destruction and harm. Protection of databases and infrastructure appear to be the main goals now. Cyber terrorists can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber-attack are not organized in a traditional manner, as they can effectively communicate over long distances without delay. One of the more prominent groups involved in large-scale hacking events recently is the group “Anonymous.” They have been known to overtake websites, and alter the content that is presented to the public. The largest threat to institutions from cyber terrorism comes from any processes that are networked and controlled via computer. Any vulnerability that could allow access to sensitive data or processes should be addressed and any possible measures taken to harden those resources to attack.

When considering cyber terrorism or cyber-attack, locations with publicly accessible or shared computer workstations are more vulnerable to malicious internet outages, as open access allows for easier access to shared data and system information.

History/Vulnerability

Clarion County has had municipalities, residents and businesses affected by these events. Clarion University in December 2017 was hacked by a phishing scam, some student information was compromised.

Many municipalities, schools and organizations are not reporting this type of event. To date the known extent of damages has been low.

Probability

The vulnerability of cyber incidents can only be addressed by the users of every individual computer system. Cyber incidents will continue to impact the County, municipalities, schools, residents and businesses in Clarion County. This type of event remains a **moderate** probability.

Mitigation

Clarion County has developed and distributed a Cyber Incident Plan.

Municipalities, schools, University, health care facilities and businesses/industries will maintain security software on computer systems, backup data offsite and notify Clarion County DPS of cyber incidents.

Law enforcement agencies will monitor identified facilities/infrastructures.

9. Product Defect or Contamination

The production process of goods and foods can lead to defects or contamination.

History/Vulnerability

There have been no reported incidents of defected or contaminated products manufactured in the County. The County has been affected by products from other states and countries. The latest incidents were in flour, cake mixes, lettuce, peanuts and peanut butter being contaminated, as well as lead-based paint on toys.

Probability

These types of incidents will continue to occur. The probability is **low** for a major impact on the County.

Mitigation

Work with Commonwealth and Federal agencies to identify and monitor incidents. Also provide accurate public information.

10. Robbery/Theft/Fraud

Robberies, theft and fraud incidents happen in the County. Robbery is usually with a weapon or the implication of a weapon. Theft is the taking and carrying away of personal goods or property of another. Fraud is the use of deception or breach of confidence to gain an unfair advantage over someone to steal information or property.

History/Vulnerability

Criminal activity has always been a problem and will continue to be a problem. Clarion County has seen a major increase in drug related crimes. The County has only 3 municipal police departments covering 8 municipalities with the other 26 municipalities covered by Pennsylvania State Police (PSP). Clarion County does have a Sheriff and deputies, however; their primary duty is to support the court system with limited law enforcement activities. Of the 3 municipal police departments only 1 has an officer on the road 24 hours. The other 2 have PSP coverage during off hours. These municipal police departments usually only have 1-2 officers on duty at a time. The County does have 5-part time detectives (they also may serve as police officer or Sheriff Deputies). Clarion University has a police department that services the University.

Available statistics:

2018: Clarion County law enforcement had cleared 99 theft and 24 fraud offenses

2017: Clarion County law enforcement had cleared 63 theft and 23 fraud offenses

2016: Clarion County law enforcement had cleared 101 theft and 34 fraud offenses

2015: Clarion County law enforcement had cleared 194 theft and 12 fraud offenses

2014: Clarion County law enforcement had cleared 177 theft and 16 fraud offenses

Probability

The probability of this type of event is **high**. Given the current economic issues and the status of law enforcement coverage in the County, criminal activity will remain an issue. Identity theft is on the rise in the County and across the nation.

Mitigation

Law enforcement agencies will continue to provide public information and education programs as well as enforcement activities to help decrease incidents.

Pennsylvania State Police offers programs on burglary prevention, fraud prevention and identity theft.

Clarion County Sheriff's Office offers programs on neighborhood watch, gun safety, fraud prevention and identity theft.

11. Strike or Labor Dispute

Labor strikes are generally not a current problem in Clarion County.

History/Vulnerability

While strikes and labor disputes are not a common issue within Clarion County, there is a strong likelihood of this issue occurring. There are unions in Clarion County, Clarion University, all seven school districts and some businesses/industries.

Clarion University professors went on strike in October 2016 for 3 days.

Probability

With active unions in Clarion County there is always a possibility for strikes. The probability of this type of event is **low**.

Mitigation

Strikes will be handled on a case by case basis. Most will not require any action.

12. Suspicious Package (Container or Letter)

Suspicious packages include mailed letters/packages and abandoned packages (not in a location for normal delivery and unattended). These constitute an implied threat due to the unknown nature of the contents. Suspicious package can be identified by some of the following: excessive postage, no return address, protruding wires, strange odor, oily stains on wrapping, powder substance or fictitious return address.

History/Vulnerability

Clarion County is vulnerable to suspicious package incidents. The County has County, Commonwealth and Federal buildings, health care facilities, schools and a university. These facilities tend to receive suspicious packages.

Clarion County has had incidents with backpacks, suitcases and mailed packages/letters.

Clarion County has had numerous amounts of white powdery substance calls. The contracted Clarion County HazMat Team responded to incidents in New Bethlehem and Rimersburg for cleanup of the packages. The US Postal Service has responded to incidents as well with County EMA staff. All incidents were noted to be a hoax.

Probability

These types of incidents will continue to occur. The probability is **low** for a major impact on the County.

Mitigation

Federal, Commonwealth and law enforcement agencies should continue to provide public information and education programs as well as enforcement activities to help control incidents.

All jurisdictions, public safety agencies and businesses should report these events to Clarion County.

13. Terrorism (Explosive, Chemical, Biological, Radiological, Nuclear, Cyber)

The FBI defines terrorism as “the unlawful use of force against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives”.

Two types of terrorism identified by the FBI are domestic terrorism and international terrorism.

Domestic terrorism involves group(s) or individual(s) whose terrorist activities: Involve acts dangerous to human life that violate federal or Commonwealth laws; appear intended to intimidate or coerce a civilian population; to influence the policy of a government by intimidation or coercion; to affect the conduct of a government by mass destruction, assassination or kidnapping; occur primarily within the territorial jurisdiction of the U.S and are lacking foreign sponsorship. If there is a terrorism event in Clarion County, the event would be of the domestic type.

International terrorism involves groups of individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries. Examples would be the Al Qaeda and ISIS terrorist networks. These groups have been responsible for a number of attacks on US interests including the terrorist attacks of September 11, 2001.

Using the acronym ‘B-NICE’ we can describe 5 types of terrorist attacks.

- **Biological** – Most likely to occur and like a nuclear attack, can have the greatest impact, especially to human life. Hardest to detect because the symptoms don’t show up right away and many individuals can become infected before they are detected.

4 types of biological agents and common examples:

- Bacteria – Anthrax and Cholera
- Viruses – Small Pox and Ebola
- Rickettsia – Q fever
- Toxins – Botulism, SEB, and Ricin

- **Nuclear/Radiological** – Radiological dispersion is much more likely to occur than a nuclear incident. A nuclear incident can cause the most damage and have the greatest impact. Could be caused by a nuclear bomb attack or an attack on a nuclear facility.
- **Incendiary** – Fire bombs, liquid fuel bombs (air craft), chemical reactions.
- **Chemical** – Generally used by government agencies. Can be spread in the form of liquid, vapor, aerosol, solids and gases.

5 types of chemical agents:

- Riot Control Agents – Tear Gas or Pepper Spray - Affects the eyes and respiratory system.
- Choking Agents – Phosgene or Chlorine - Affects the respiratory system.
- Blood Agents – Hydrogen Cyanide. Affects the respiratory and circulatory systems.
- Nerve Agents – Tabun, Sarin, Soman, and VX - Affects the nervous system

- Blister Agents – Mustard Gas and Lewisite - Causes burns to the skin and internal organs.
- **Explosive** - Most common tool of terrorists. Weapons of choice: dynamite, pipe bombs and car/truck bombs.
- **Cyber-Terrorism** - Another form of terrorism that has emerged recently is cyber-terrorism. Cyber-terrorism is best described by altering the Federal Bureau of Investigation's definition of terrorism, to include "using computing resources" as another method of intimidation.

Cyber-terrorism can be anything from a "virus"; to outside sources accessing data from any computer system via the internet; to disrupting any or all services provided to the public. Adding to the problem is that the public and private sectors are relatively ignorant of just how much their life depends on computers as well as the vulnerability of those computers.

In recent years, cyber terrorism has become a larger threat than in years past. Cyber terrorism can be defined as activities intended to damage or disrupt vital computer systems. These acts can range from taking control of a host website to using networked resources to directly cause destruction and harm. Protection of databases and infrastructure appear to be the main goals at this point in time. Cyber terrorists can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber-attack are not organized in a traditional manner, as they are able to effectively communicate over long distances without delay. One of the more prominent groups involved in large-scale hacking events recently is the group "Anonymous." They have been known to overtake websites, and alter the content that is presented to the public. The largest threat to institutions from cyber terrorism comes from any processes that are networked and controlled via computer. Any vulnerability that could allow access to sensitive data or processes should be addressed and any possible measures taken to harden those resources to attack.

History/Vulnerability

Prior to 9/11/2001, the threat of international terrorism was unheard of in the country, but that has all changed. Surrounding counties nearly became direct targets of an international terrorist attack when high-jacked Flight 93 flew over nearby counties and crashed in Somerset County.

A second wave of terror began a few weeks later when letters, tainted with anthrax, began showing up in Florida, New York, and Washington DC. This second wave of terror hit Clarion County also, with many calls of suspicious substances being found. Clarion County's contracted HazMat Response Team responded to these incidents, but found no legitimate threats. The following is a list of some of the occurrences that have been documented in Clarion County:

2001 White Powder Incidents: In October of 2001 Clarion County had numerous amounts of white powdery substance calls. The contracted Clarion County HazMat Team responded to incidents in New Bethlehem and Rimersburg for cleanup of the packages. All of the incidents were noted to be a hoax.

Although terrorists will usually select their targets based on the impact that the event will make, the reality is that targets of terrorists can include anything, can target anyone and can occur anywhere.

Cyber-Terrorism has come to national attention with events at major business across the United States. Everything from credit card/banking/personal information being stolen, the disruption of websites. There has been Clarion County residents and businesses affected by these events. The vulnerability of Cyber-Terrorism can only be addressed by the users of every individual computer system.

In December 2018 emails were sent to banks, schools, companies and private residents across the Commonwealth stating there were bombs placed at their locations. The email requested bitcoin payment or bomb would be detonated.

Lone Wolf Extremists

Lone wolf extremists pose a potentially significant threat to both the law enforcement and the general public. Lone wolves have views that are more extreme than others. These individuals can have either international or domestic learnings and could target law enforcement, other public officials, individuals of different races, ethnicity, nationality, gender orientation or religion. Intelligence rarely exists prior to lone wolf attacks except when information is accidentally leaked, or through brazen, intentional releases, which are typically discovered after the fact.

Recent lone wolf attacks have gravitated toward simple schemes and unsophisticated weapons. Much less practice and pre-operational planning is required to carry out attacks using firearms, edged weapons or vehicles.

In general, the following is list of potential targets that a terrorist may select:

- Commercial facilities, particularly multinational or international firms.
- Communications Centers (9-1-1)
- Industrial facilities, particularly those storing large quantities of hazardous materials or those involved in military development.
- Abortion or family planning clinics or any organization associated with a socially controversial issue.
- Utility facilities including power generation plants, dams and water treatment plants.
- Law enforcement facilities.
- Facilities housing important political or religious figures.
- Historical sites.
- Transportation infrastructure.
- High profile events attracting large amounts of people.
- Educational facilities, especially colleges and universities.
- National special events

Probability

Although the probability of Clarion County being the target of a direct domestic terrorist attack is greater than it being the direct target of an international terrorist attack, it should be equally prepared for both. It is hard to determine at this point what the actual probability of a terrorist attack occurring within the County is. However, it is safe to assume that it is much greater than it was before 09/11/2001. The probability of this type

of event is **low**.

Cyber-terrorism will continue to impact the County, municipalities, schools, University, residents and businesses in Clarion County. This type of event remains a **high** probability.

Mitigation

Teaching terrorism awareness is the basic building block of any mitigation program. First responders (fire, EMS, and Law Enforcement) have been trained through terrorism awareness and terrorism operations courses that are available.

The public has received some terrorism awareness through the Citizens Emergency Response Teams (CERT) course. Recognizing the threat of terrorism, both domestic and international, revisions have been made to the Emergency Operations Plan, that will enhance the response capabilities of County departments/agencies. The Clarion County Department of Public Safety is a member of the Northwest Central PA Emergency Response Group and has taken an active role in securing equipment and providing training for the first responders of Clarion County.

Coordinate with Commonwealth and Federal agencies to provide/continue training for businesses on cyber-terrorism. Currently there are no foolproof ways to protect a computer system other than complete isolation (no outside connection).

14. Vandalism/Sabotage

Vandalism

History/Vulnerability

Criminal activity has always been a problem and will continue to be a problem. Clarion County has seen a major increase in drug related crimes. The County has only 3 municipal police departments covering 7 municipalities, with the other 27 municipalities covered by Pennsylvania State Police (PSP). Clarion County does have a Sheriff and deputies, however; their primary duty is to support the court system with limited law enforcement activities. Of the 3 municipal police departments only 1 has an officer on the road 24 hours. The other 2 have PSP coverage during off hours. These municipal police departments usually only have 2 officers on duty at a time. Clarion University has a police department that services the University.

Available statistics:

2018: Clarion County law enforcement had cleared 23 vandalism

2017: Clarion County law enforcement had cleared 24 vandalism

2016: Clarion County law enforcement had cleared 16 vandalism

2015: Clarion County law enforcement had cleared 25 vandalism

2014: Clarion County law enforcement had cleared 38 vandalism

Probability

Given the current economic issues and the status of law enforcement coverage in the County criminal activity will remain an issue. The probability of this type of event is **high**.

Mitigation

Law enforcement agencies will continue to provide public information and education programs as well as enforcement activities to help decrease incidents.

Pennsylvania State Police offers programs on burglary prevention, fraud prevention, drug awareness and identity theft.

Clarion County Sheriff Office offers programs on neighborhood watch, gun safety, fraud prevention, drug awareness and identity theft.

Sabotage

Sabotage is the deliberate or intentional destruction of something (i.e. computer virus, tampering with communication equipment, etc.).

History/Vulnerability

While Clarion County typically does not suffer from this on a large scale (commercial/industrial) we do encounter your deminimus criminal mischiefs. This relates more to personal property (mailboxes, automobiles, signs, etc.).

There have been a few reported incidents in the last ten years. The County is vulnerable to this type of event.

Probability

With the increase need for communication and electrical facilities this would be an area of concern for law enforcement in the near future. The occurrence of this event is **medium**, however; a person could create the potential for a large-scale event.

Mitigation

It would be hard to predict all possible events. Evaluate possible targets and increase protection.

15. Workplace/School/University Violence

Violence in work places, schools and universities has been on the increase across the country over the last few years. Most acts of violence at these facilities relate to domestic violence, harassment, bullying and hazing issues.

History/Vulnerability

There have been no reported work place incidents in the last five years. If there are businesses in the County we are vulnerable.

School reported incidents included threats against school officials/students, disorderly conduct, simple assaults, weapons and terroristic threats.

Clarion University has not reported any incidents.

Probability

The probability of this type of event is **high**.

Mitigation

Law enforcement agencies should work with businesses, schools and the university to help them identify possible situations that might lead to violence and provide educational programs.

Schools and human service agencies to continue to provide programs on harassment, bullying and hazing issues.

16. Opioid Addiction

Opioid addiction occurs when an individual becomes physically dependent on opioid, a class of drugs that reduces pain. Opioid is used as a broad term and includes opiates, which are drugs naturally extracted from certain types of poppy plants, and narcotics. Opioids can also be synthetically made to emulate opium.

According to the Drug Enforcement Administration (DEA) opioids come in various forms: tablets, capsules, skin patches, powder, chunks in various colors from white to shades of brown and black, liquid form for oral use and injection, syrups, suppositories, and lollipops. The Centers for Disease Control and Prevention (CDC) defines the following as the three most common types of opioids:

- **Prescription Opioids:** Opioid medication prescribed by doctors for pain treatment. Prescription opioids can be synthetic-oxycodone (OxyContin) or hydrocodone (Vicodin), or natural, like morphine.
- **Fentanyl:** A powerful synthetic opioid that is 50 to 100 times more powerful than morphine and used for treating severe pain. Illegally made and distributed fentanyl is becoming more prevalent.
- **Heroin:** An illegal natural opioid processed from morphine and is also becoming more commonly used in the United States.

Opioids are highly addictive. They block the body's ability to feel pain and can create a sense of euphoria. Additionally, individuals often build a tolerance to opioids, which can lead to misuse and overdose.

History/Vulnerability

Opioid addiction impacts the entire Commonwealth. Nationally, Pennsylvania is among four of the hardest hit states from opioid-related deaths. The CDC estimates that nearly 38 out of every 100,000 Pennsylvania residents died from opioid-related overdoses in 2016. In Pennsylvania, overdoses caused by opioids have become the leading cause of accidental death, surpassing automobile accidents (CDC- 2017).

According to a joint intelligence report prepared by the DEA Philadelphia Division and the University of Pittsburgh, a higher percentage of drug-related deaths attributed to opioid use in Pennsylvania's rural communities at 42 percent, compared to 34 percent in urban communities.

Clarion County Coroner reports the following overdose deaths, 6 in 2017 and 11 in 2018.

Clarion County treatment facilities reported that in 2017 there were 17 people treated for drug overdoses and in 2018 there were 40 people treated for drug overdoses.

Probability

The probability of this type of event is **high**.

Mitigation

Armstrong, Indiana and Clarion Drug and Alcohol Commission to continue to provide education programs (prevention, Naloxone, etc.).

Human service agencies to provide in-patient and out-patient treatment programs.

F. Technological Caused Events

1. Hardware, Software and Network Connectivity Interruption, Disruption or Failure

Computer systems are used throughout the County by businesses, industries, emergency responders and residents. The main providers for internet service are Verizon, Comcast, Zito, Venus, Choice, Atlantic Broadband and Windstream.

History/Vulnerability

There have been computer viruses causing problems in some areas. There have been many incidents across the United States and the world of hacking. There have been no reports of hacking in the County.

The rural nature of the County limits use of computers at residence and some municipalities because of lack of internet access. Approximately 50% of the County does not have hard wired systems and satellite systems are extremely expensive.

Clarion County governments, Clarion University, public safety agencies, hospitals, extended care facilities, businesses, service industries and utilities all rely heavily on the internet for day to day operations.

Network connectivity interruption, disruption or failure **are not reported to the County**. There have been times when network connectivity interruption, disruption or failure impacted Clarion County facilities. These occur about approximately 3 or 4 times a year.

Probability

The probability of this type of event is **high**.

Mitigation

Work with providers to ensure security/virus programs are current and they are maintaining and upgrading infrastructure systems. Maintain secondary systems to back up at key infrastructure facilities. Work on establishing a rural broadband system.

2. Utility Interruption, Disruption or Failure

Telecommunications

Telecommunications includes voice, video, and internet communications services.

The County has many providers for each system. The main providers for wired telephone are Verizon, Sprint, Venus and Windstream. For wireless the main providers are Verizon, AT&T, T-Mobile and Sprint. Video is provided by AT&T Broadband, Comcast and Sting Communications for wired service. Dish and Direct TV are the main satellite systems.

History/Vulnerability

In August 2003, a widespread power outage occurred and resulted in twelve municipalities within the northwestern section of Clarion County being without power for approximately twelve hours as a result of the blackout. The lack of power caused a loss of some

telecommunication systems.

Due to the rural nature of the County and lack of telecommunication systems infrastructure, we are vulnerability to these types of events. Outages are as follows:

2018: 8 reported major incidents of telephone outages

2017: 5 reported major incidents of telephone outages

2016: 6 reported major incidents of telephone outages

2015: 6 reported major incidents of telephone outages

2014: 9 reported major incidents of telephone outages

Probability

The probability of these types of events is **high**.

Mitigation

Maintain emergency procedures at 9-1-1 center for this type of incident.

Work with telecommunication companies to identify and address possible incident scenarios.

Ensure a redundant public information system and a redundant system for 9-1-1 calls.

Work with providers to ensure backup generators at switching stations.

Energy/Power/Utility

The electric suppliers for the County are West Penn Power, Central Electric, Penelec Electric and United Electric. The natural gas suppliers are Columbia Gas, Dominion Peoples, Equitable Gas, National Fuel, T.W. Phillips Gas and UGI Central Penn Gas.

History/Vulnerability

There are between 113-199 miles of natural gas pipe lines throughout the County (U.S. Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration). Companies currently with major lines in the County are Columbia Gas, Dominion Peoples, Dominion Transmission Inc., Equitable Gas, National Fuel, T.W. Phillips Gas & Oil and UGI. There are many small companies that have pipe lines in the County.

In August 2003, a widespread power outage occurred because of a disruption to the power grids in states to the north and east of Pennsylvania and then cascading into the Commonwealth. Early reports estimated the total number customer affected in Pennsylvania at over 100,000. Twelve municipalities within the northwestern section of Clarion County were without power for approximately twelve hours as a result of the blackout. Parts of several municipalities were without power for as long as 48 to 72 hours.

The rural nature of the County and lack of infrastructure causes us to be vulnerability to these types of events. Reported energy/power outages in Clarion County:

2018: there were 41

2017: there were 59

2016: there were 52

2015: there were 56

2014: there were 30

These were mainly due to severe weather, leaks or vehicle accidents. The largest of these incidents:

In November 2018 a winter storm affected approximately 8,000 customers in 8 municipalities, some customers were without power for 5 days. Four municipalities opened Comfort Centers for their residents. Two water plants and 1 pumping station were without power and had to acquire generators to keep water flowing.

In 2017 a storm affected approximately 2,200 customers in 4 municipalities with 1000 customers in the East Brady Borough and Brady Township area, lasted about 24 hours. No sheltering was needed, however the Red Cross provided hot meals.

Probability

The probability of these types of events is **medium**. Most outages are caused by storms and accidents.

Mitigation

Work with energy companies to identify and address possible incident scenarios. Ensure good public information system. Residents and utility companies should maintain clearance of trees and shrubs around right-of-ways. Gas companies should replace old pipelines.

Communications System Interruptions

EMS, fire and law enforcement agencies are the primary groups using the County communication systems. There are other agencies (i.e. transportation providers, public works departments, school districts) that have their own systems. There are also communication systems between the County and the Commonwealth agencies.

History/Vulnerability

Over the last 5 years there have been occasions when parts of the systems were interrupted. These events were caused by lightning strikes, construction incidents and carrier outages. Weather and human caused incidents will keep us vulnerable to interruptions. All tower sites are secured with backup power supplies.

2018: there were 10 reported major outages

2017: there were 6 reported major outages

2016: there were 8 reported major outages

2015: there were 3 reported major outages

2014: there were 4 reported major outages

Probability

There is always a potential for this event to occur, however; it is **low**.

Mitigation

Continue to develop redundant systems, upgrading communication sites, continue monthly tower site checks and continue preventive maintenance programs.

Electromagnetic Pulse (EMP)

An electromagnetic pulse is produced by a nuclear explosion. Several major factors control the effectiveness of a nuclear EMP weapon. These are:

- a. The altitude of the weapon when detonated;
- b. The yield and construction details of the weapon;
- c. The distance from the weapon when detonated;
- d. Geographical depth or intervening geographical features;
- e. The local strength of the earth's magnetic field.

Non-nuclear electromagnetic pulse is an electromagnetic pulse generated without use of nuclear weapons. This could be used to disrupt electronic systems.

History/Vulnerability

There is no history of the County being affected by EMP. The County is vulnerability to terrorism and this device could be used.

Probability

Typical modern scenarios seen in news accounts speculate about the use of nuclear weapons by rogue states or terrorists in an EMP attack. Details of such scenarios are always controversial. It is impossible to know what kinds of capabilities that terrorists might acquire, especially if they are aided by state sponsors with advanced capabilities. The probability of this type of event is **low**

Mitigation

Ensure protection of electronic equipment specifically those used for emergency notification and response.

IV. SUMMARY

The hazards most likely to affect population and property within Clarion County are natural occurring hazards, primarily flooding, winter storms and windstorms. Human caused events like opioid addiction, cyber terrorism, hazardous materials incidents, transportation incidents, fires and criminal activity are likely to affect Clarion County.

The most serious human caused hazard likely to occur in the County is a major hazardous materials spill, probably along Interstate 80.

Any hazard can affect lives and property, even if it occurs infrequently. Therefore, the Clarion County Department of Public Safety must plan for any potential hazard, while giving priority to those most likely to occur and to have the most serious impact on the populace of Clarion County.

Responsibility for emergency management begins at the municipal level of government in Pennsylvania. However, as the scope of disaster or the level of resources required increases, the County and even Commonwealth governments must be involved. It is important, therefore, that every level of government assess the hazards that threaten their communities so that appropriate response, precautions and preventive measures can minimize the effects of these events.

V. TRAINING

The Clarion County Department of Public Safety is committed to the enhancement of emergency services and an effective and coordinated response capability based on a current assessment of the hazards that threaten Clarion County.

Clarion County DPS in cooperation with Butler Community College and their preferred partner program; continue to offer all fire academy classes to emergency service companies in the county at no cost. Programs offered enhance the capabilities of responders to various hazardous.

Maintain the Disaster/Crisis Outreach and Referral Team (DCORT) and Critical Incident Stress Management (CISM) team. Continue outreach for new team members and training for all team members.

VI. REFERENCES

Federal

Federal Emergency Management Agency
Federal Bureau of Investigation
Federal Highway Administration
Department of Homeland Security
Federal Aviation Administration
United States Department of Agriculture
United States Food and Drug Administration
United States Geological Society
United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration

Commonwealth

Pennsylvania Emergency Management Agency
Pennsylvania Department of Commerce
Pennsylvania Department of Environmental Protection
Pennsylvania Department of Transportation
Pennsylvania State Police – Clarion
Pennsylvania State Police - Marienville
Pennsylvania State Police - Hershey
Pennsylvania Department of Health
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
Pennsylvania Game Commission
Pennsylvania Fish and Boat Commission
Public Utility Commission, Bureau of Safety and Compliance, Harrisburg, Pennsylvania

County

Clarion County Geographic Information System/Mapping
Clarion County Assessment Office
Clarion County District Attorney Office
Clarion County Planning & Development Department
Clarion County Airport, Shippenville, Pennsylvania
Clarion County Local Emergency Planning Committee
Clarion County Hazard Mitigation Plan
Clarion County Emergency Operations Plan
Clarion County Severe Weather Plan
Clarion County Extreme Temperature Plan
Clarion County Cyber Plan

Clarion County Comprehensive Plan
Clarion County Schools
Storm Water Management Ordinance

Other

National Oceanic & Atmospheric Administration (NOAA)
National Weather Service (NWS)
Electric Companies
Natural Gas Companies
Telecommunication Companies
Pipeline Companies

Appendix 1 Tornadoes and Windstorms

Date	Type	Comments/Type of Declaration
11/16/18	Windstorm	Trees down, power outages and some property damage. Damages \$13,000
6/18/2018	Windstorm	Trees down, power outages and some property damage. Damages \$2,000
5/15/2018	Windstorm	Trees down, power outages and some property damage. Damages \$8,000
5/4/2018	Windstorm	Trees down, power outages and some property damage. Damages \$2,500
3/2/2018	Windstorm	Trees down, power outages and some property damage. Damages \$1,000
11/5/2017	Windstorm	Trees down, power outages and some property damage. Damages \$2,500
8/22/2017	Windstorm	Trees down, power outages and some property damage. Damages \$1,000
8/4/2017	Windstorm	Trees down, power outages and some property damage. Damages \$2,500
7/11/2017	Tornado EF0	Trees down, power outages and some property damage. Damages \$10,000
6/19/2017	Tornado EF0	Trees down, power outages and some property damage. Damages \$35,000
6/18/2017	Windstorm	Trees down, power outages and some property damage. Damages \$2,500
5/28/2017	Windstorm	Trees down, power outages and some property damage. Damages \$16,000
5/1/2017	Tornados (3 EF0&1 EF1)	Trees down, power outages and some property damage. Damages \$76,000
1/12/2017	Windstorm	Trees down, power outages and some property damage. Damages \$1,500
9/8/2016	Windstorm	Trees down, power outages and some property damage. Damages \$10,500
8/25/2016	Windstorm	Trees down, power outages and some property damage. Damages \$2,000
7/24/2016	Windstorm	Trees down, power outages and some property damage. Damages \$5,000
7/13/2016	Windstorm	Trees down, power outages and some property damage. Damages \$2,500
6/16/2016	Windstorm	Trees down, power outages and some property damage. Damages \$5,000
9/4/2015	Windstorm	Trees down, power outages and some property damage. Damages \$3,500
7/19/2015	Windstorm	Trees down, power outages and some property damage. Damages \$1,000
6/30/2015	Windstorm	Trees down, power outages and some property damage. Damages \$10,000
6/12/2015	Windstorm	Trees down, power outages and some property damage. Damages \$25,000
5/31/2015	Windstorm	Trees down, power outages and some property damage. Damages \$1,000
5/11/2015	Windstorm	Trees down, power outages and some property damage. Damages \$1,000
7/27/2014	Windstorm	Trees down, power outages and some property damage. Damages \$25,000
7/7/2014	Windstorm	Trees down, power outages and some property damage. Damages \$5,000
6/24/2014	Windstorm	Trees down, power outages and some property damage. Damages \$5,000
6/18/2014	Tornado EF0 & Windstorm	Trees down, power outages and some property damage. Damages \$35,000
6/17/2014	Windstorm	Trees down, power outages and some property damage. Damages \$20,000

**Appendix 2
Signature Page**

Maintained on file in EMA office