3.4.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Figure 123, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Tazewell County. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln have documented 61 occurrences of tornadoes in Tazewell County between 1950 and 2017. In comparison, there have been 2,199 tornadoes statewide between 1950 and 2012 according to the most recent Illinois Natural Hazard Mitigation Plan.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2017): ***61***

Highest F-Scale Rating Recorded: ***EF4 (November 17, 2013)***

Most Likely Month for Tornadoes to Occur: ***May***

Most Likely Time for Tornadoes to Occur: ***Afternoon / Early Evening***

Average Length of a Tornado: ***2.75 miles***

Average Width of a Tornado: ***121 yards***

Average Damage Pathway of a Tornado: ***0.19 sq. mi.***

Longest Tornado Path in the County: ***21.1 miles (F3 May 13, 1995)***

Widest Tornado Path in the County: ***880 yards (F3 May 13, 1995 & EF4 November 17, 2013)***

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Figure 124 charts the reported occurrences of tornadoes by magnitude. Of the 61 reported occurrences there was: one – EF4, four – F3s, nine – F2s, four – EF2s, fourteen – F1s, two – EF1s, twenty-four – F0s, and three – EF0s.

Figure 125 charts the reported tornadoes by month. Of the 61 events, 32 (52%) took place in May and June making this the peak period for tornadoes in Tazewell County. Of those 32 events, 20 (62.5%) occurred during May making this the peak month for tornadoes. In comparison, 1,457 of the 2,199 tornadoes (66%) recorded in Illinois since 1950 took place in April, May and June.

Figure 124
Graph: Tornadoes by Magnitude Tazewell County: 1950 – 2017

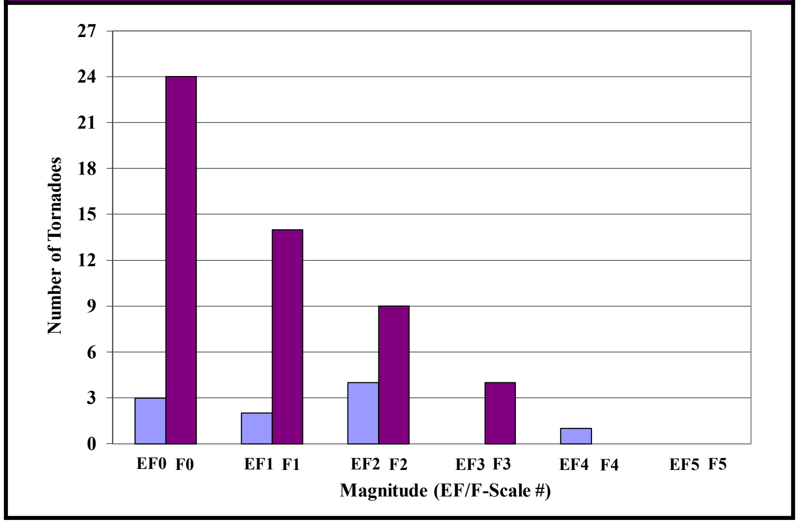


Figure 125
Graph: Tornadoes by Month Tazewell County:1950 – 2017

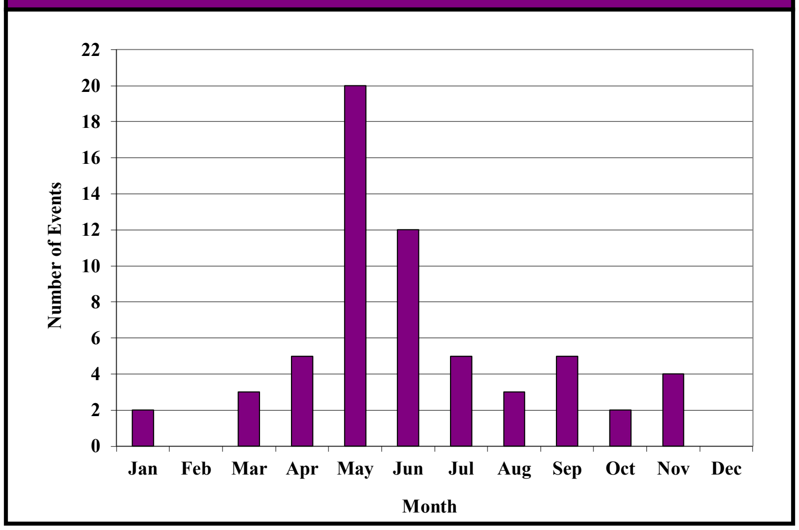
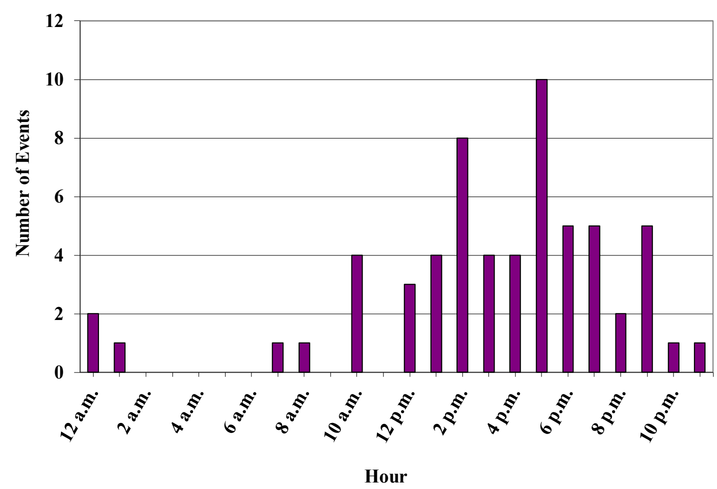


Figure 126 charts the reported tornadoes by hour. Approximately 85% of all tornadoes occurred during the p.m. hours, with 31 of the p.m. events (60%) taking place between 2 p.m. and 7 p.m. In comparison, more than half of all Illinois tornadoes occur between 3 p.m. and 7 p.m.

The tornadoes that have impacted Tazewell County have varied from 0.1 miles to 21.1miles in length and from 10 yards to 880 yards in width. The average length of a tornado in Tazewell County is 2.75 miles and the average width is 121 yards (0.069 miles).

Figure 126
Graph: Tornadoes by Hour Tazewell County: 1950 – 2017



Figures 127, **128** and **129** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 123**. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Tazewell County, the average damage pathway or area impacted by a tornado is 0.19 square miles.

The longest and widest tornado recorded in Tazewell County occurred on May 13, 1995. This F3 tornado, measuring 25.0 miles in length and 880 yards in width, touched down in Mason County north of Goofy Ridge in Sand Ridge State Park and traveled east-northeast into Tazewell County before lifting off east of Tremont. The tornado was on the ground in Tazewell County for approximately 21.1 miles. The damage pathway of this tornado covered 12.5 square miles, with approximately 10.5 square miles occurring in Tazewell County.

The EF4 tornado that occurred on November 17, 2013 also measured 880 yards wide, tying with the May 13, 1995 F3 tornado for the widest tornado recorded in Tazewell County.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. All of the participating municipalities have had reported occurrences of tornadoes within their corporate limits. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Tazewell County's hazard rating for tornadoes as "high."

Figure 127
F0 & EF0 Tornado Touchdowns in Tazewell County

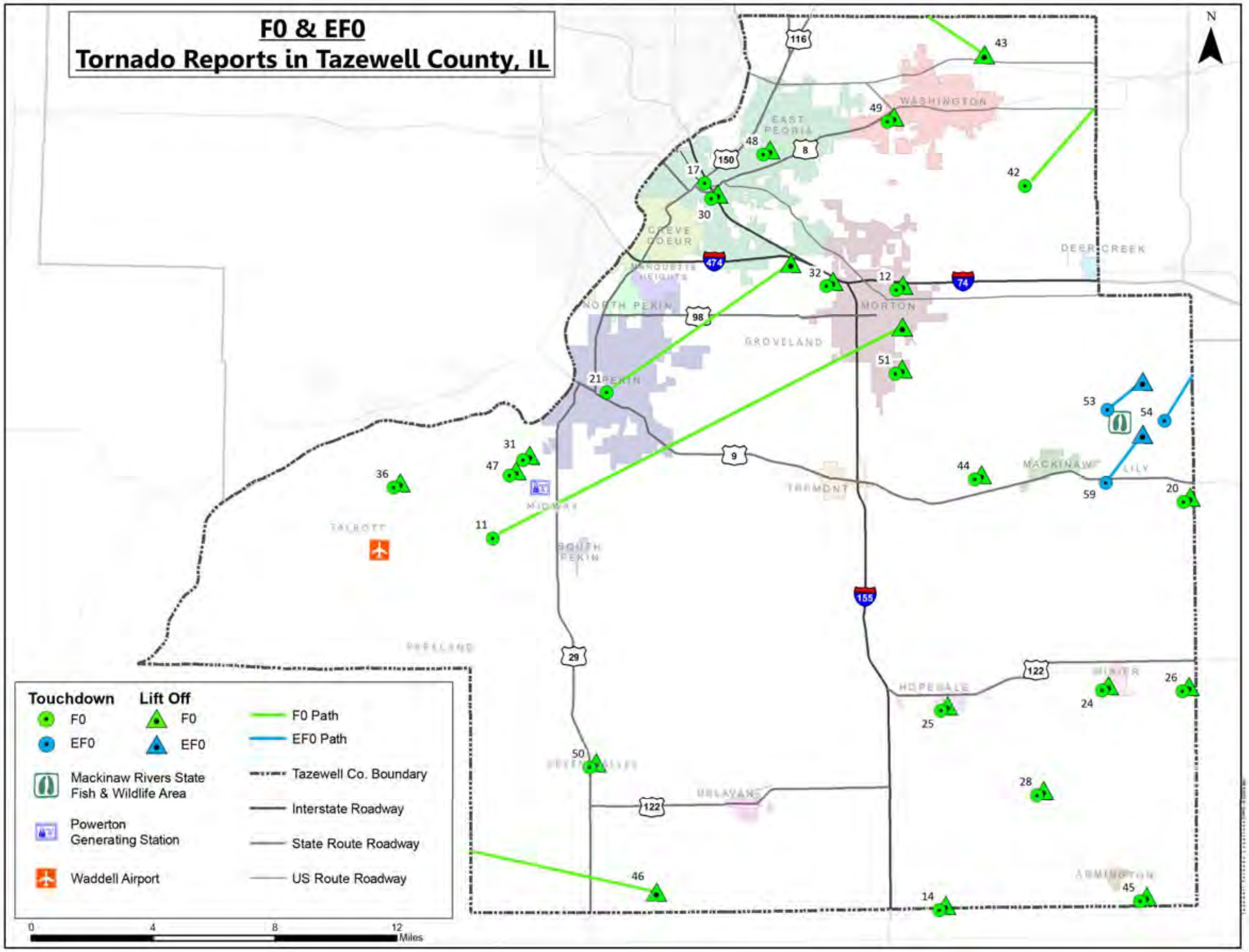


Figure 128
F1 & EF1 Tornado Touchdowns in Tazewell County

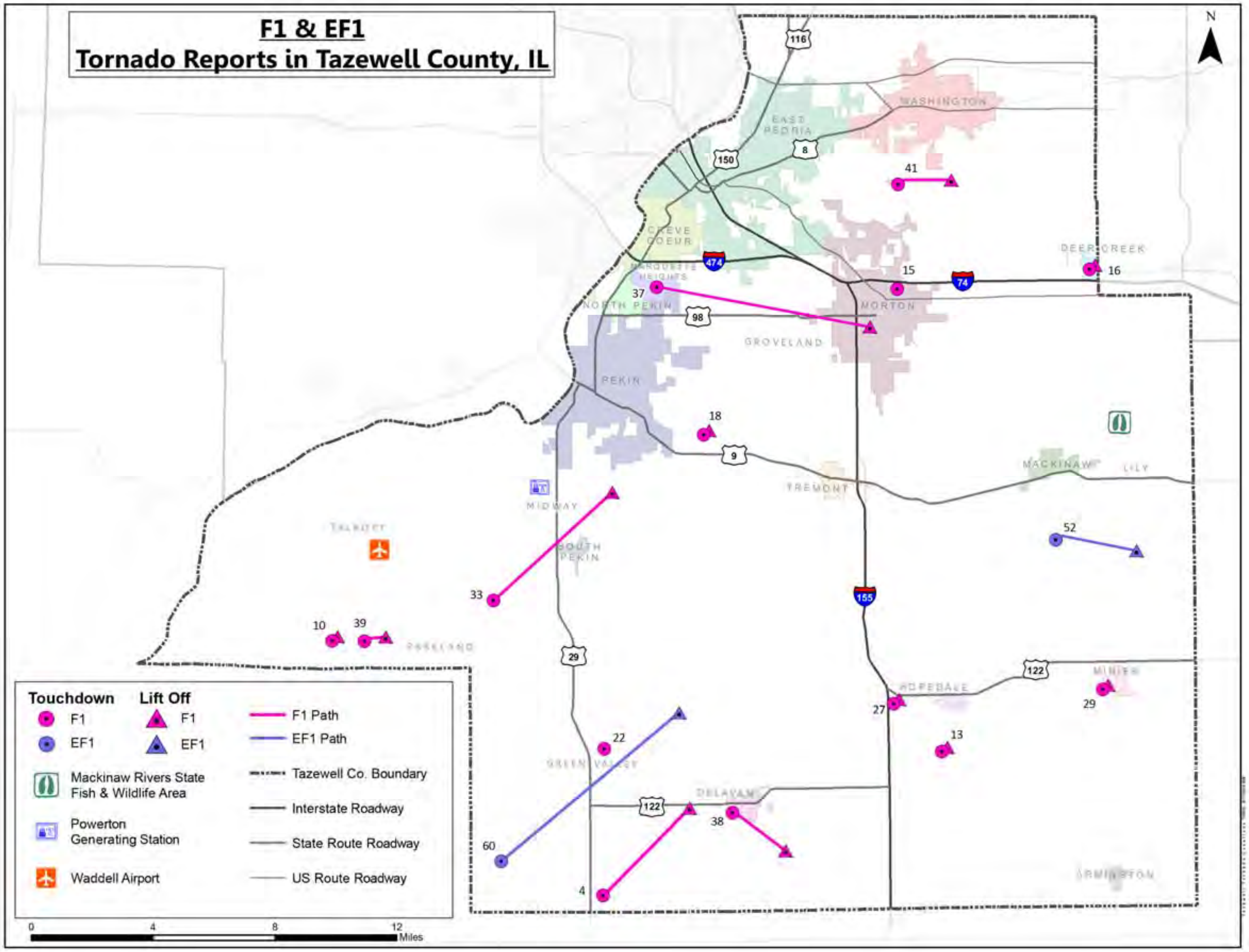
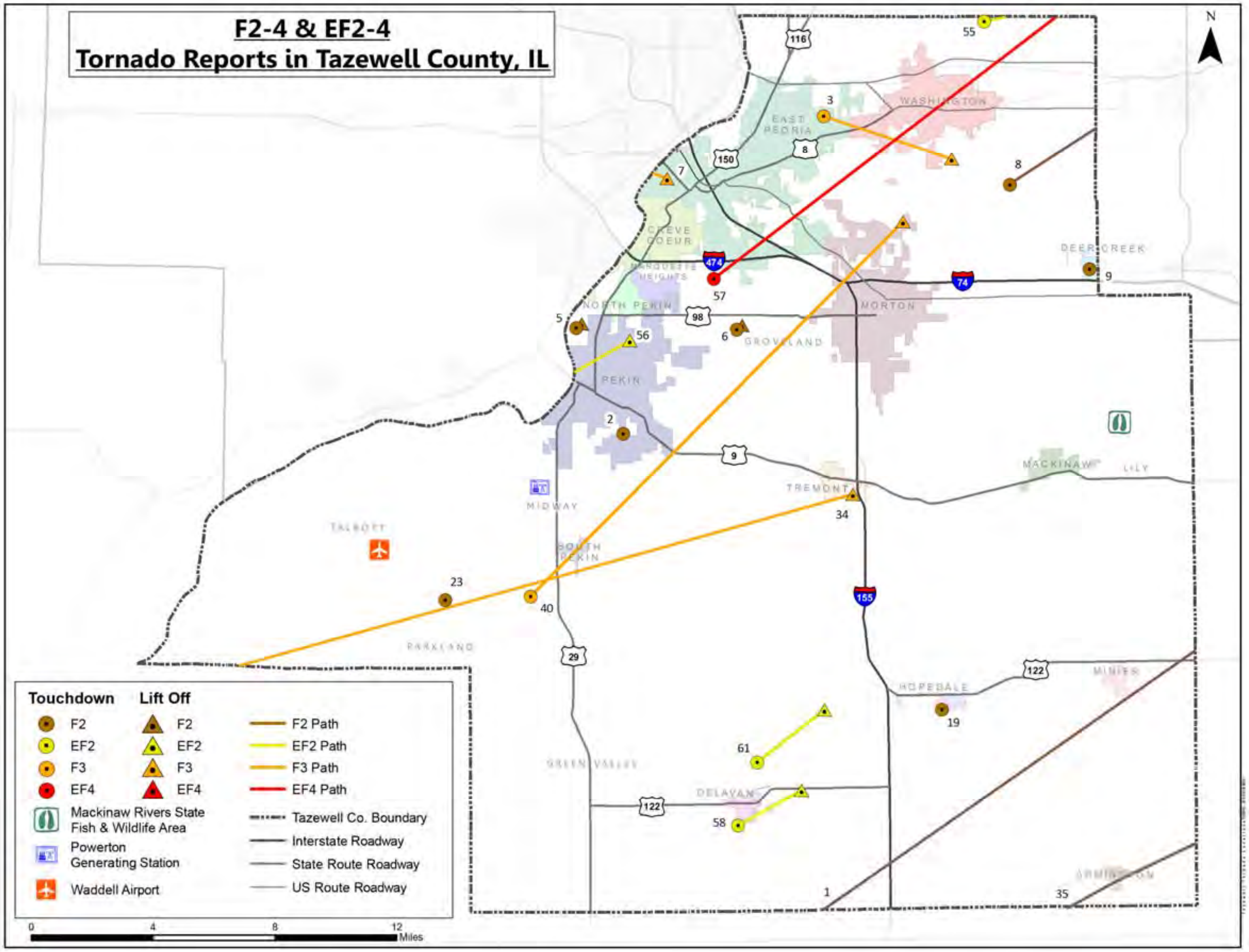


Figure 129
F2 – F4 & EF2 – EF4 Tornado Touchdowns in Tazewell County



What is the probability of future tornadoes occurring?

Tazewell County has had 61 verified occurrences of tornadoes between 1950 and 2017. With 61 tornadoes over the past 68 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is approximately 90%. There were 12 years over the last 68 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is approximately 18%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Tazewell County is vulnerable to the dangers presented by tornadoes. According to NOAA's Storm Events Database and the NWS Weather Forecast Office in Lincoln, a majority of the tornadoes have touched down or passed through the northern and central portions of the County. Since 2008, 10 tornadoes have been recorded in Tazewell County.

All of the participating municipalities have had a tornado touch down or pass through their municipal boundaries. **Figure 130** lists the verified tornadoes that have touched down in or near or passed through each participating municipality.

Figure 130
Verified Tornadoes in or Near Participating Municipalities – Tazewell County

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
East Peoria	7	1956, 1965, 1980, 1990, 1994, 2004, 2013	---
Morton	8	1973, 1976, 1998, 2003	1974, 1994, 2003, 2006
Pekin	7	1955, 1973, 1990, 2013	1981, 1995, 2003
Tremont	2	1995	1981
Washington	8	1956, 2004, 2013	1967, 2003, 2003, 2003, 2010

In terms of unincorporated areas vulnerable to tornadoes, Groveland and the Mackinaw River State Fish and Wildlife Area have had more tornadoes touch down in or near their vicinity than any other area. **Figure 131** details the verified tornadoes that have touched down in or near unincorporated areas of Tazewell County.

Figure 131
Verified Tornadoes in or near Unincorporated Areas of Tazewell County

Unincorporated Area	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Unincorporated Area	Touched Down/Passed Near Unincorporated Area
Groveland	3	1998, 2003	1960
Lilly	2	---	2008, 2015
Mackinaw River SF&WA	3	2008	2008, 2015
Midway	1	1973	---
Parkland	1	---	2000
Pekin Lake	1	1960	---
Powerton Generation Station	2	1994	2003
Talbott	2	---	1972, 1990
Wadell Airport	1	1990	---

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln indicates that between 1950 and 2017, 34 of the 61 tornadoes caused $978 million in property damages and $75,500 in crop damages. Included in the property damage total is $955 million in damages sustained as a result of the November 17, 2013 EF2 tornado in Pekin ($45 million) and the EF4 tornado that devastated portion of East Peoria ($110 million) and Washington ($800 million).

Ten of the tornadoes have property damage totals of at least $1 million. Property damage information was either unavailable or none was recorded for the remaining 27 reported occurrences.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- ❖ Total Property Damage: ***$978,130,000***
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Total Crop Damage: ***$75,500***
- ❖ Injuries: ***172***
- ❖ Fatalities: ***3***

Tornado Risk/Vulnerability to:
- ❖ Public Health & Safety – Rural Areas: ***Low to Medium***
- ❖ Public Health & Safety – Municipalities: ***High***
- ❖ Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- ❖ Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

NOAA's Storm Events Database documented three fatalities and 172 injuries as a result of nine tornado events. Detailed information on the injuries and fatalities sustained was only available for four of the events. The following provides a brief description of each.

- ❖ A worker was slightly injured when an F1 tornado destroyed the railroad barracks in South Pekin on May 9, 1995. Another injury was reported as a result of this tornado but detailed information was unavailable.
- ❖ During the May 13, 1995 F3 tornado, two individuals sustained minor injuries when a subdivision one mile south of South Pekin was destroyed.

- ❖ A man sustained minor injuries when a piece of sheetrock hit him on the head as he was taking cover from an F0 tornado that hit the Country View Estates subdivision near South Pekin on April 30, 1997.
- ❖ During the May 10, 2003 F3 tornado, an individual suffered injuries when a car was overturned by the tornado on Interstate 74 at Morton.

In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

According to the *2013 Illinois Natural Hazard Mitigation Plan*, **Tazewell County ranks in the top 10 counties in Illinois in terms of tornado frequency**. This fact alone suggests that the overall risk posed by tornadoes to public health and safety is relatively high. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

Tazewell County

Unlike several of the neighboring counties in the area, Tazewell County has very distinct differences in its population distribution and density. This coupled with the ratings and pathways of previously reported tornadoes make it difficult to assign the County as a whole a single rating level of risk or vulnerability. Instead the public health and safety risk to Tazewell County is discussed in terms of areas within the County.

For the more densely-populated ***Metro area*** in the northern portion of the County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be medium to high. In this area the population and housing unit density is higher and there are not large expanses of open spaces between municipalities. In addition, a greater number of tornadoes have either touched down or passed through this area, including higher rated tornadoes (F2/EF2 and above). Most of the injuries and fatalities have also taken place in this area. These factors suggest that a tornado that touches down or passes through will have a greater likelihood of causing injuries and fatalities.

For the ***southern and central rural/agricultural portions*** of the County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be low. In these areas the municipalities are small in size and separated by miles of open space. A majority of the tornadoes that have tracked through this area have largely occurred in open spaces such as farm fields. In addition, most of the tornadoes that have occurred in these portions of the County have had a lower F/EF rating. As a result, there is less likelihood that a tornado that touches down or passes through will cause injuries or fatalities.

In terms of adequate access to health care, the County is served by UnityPoint Health – Pekin which is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted. In addition, there are hospitals in Peoria (Peoria County), Eureka (Woodford County), Bloomington/Normal (McLean County), Lincoln (Logan County), Havana (Mason County) and Canton (Fulton County) as well as regional centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) which are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered high. This is based on the size and relatively dense and evenly distributed populations within the participating municipalities. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the County and participating municipalities are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures

One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touchdown or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1

The area impacted by an average tornado in Tazewell County = 0.19 sq. miles

Size of Tornado: To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis the area impacted by an average-sized tornado in Tazewell County will be used since it has a higher probability of recurring. In Tazewell County the area impacted by an average-sized tornado is 0.19 square miles. This average is based on over 60 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Method for Estimating the Area Impacted: Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

This method is quicker, easier and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

Method for Estimating Potentially-Damaged Housing Units: With the size of the tornado calculated and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure 132** provides a sample calculation.

Figure 132
Calculation of Average Housing Unit Density – Tazewell County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction = Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Tazewell County: 57,516 housing units ÷ 648.973 sq. miles = 88.62618 housing units/sq. miles
(89 housing units)

Figure 133 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

Figure 133
Average Housing Unit Density by Participating Municipality – Tazewell County

Jurisdiction	Total Housing Units (2010)	Mobile Homes (2017)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
East Peoria	10,590	24	19.957	530.64088
Morton	6,973	495	12.953	538.33089
Pekin	14,714	44	14.559	1,010.64634
Tremont	942	0	0.944	---
Washington	6,189	8	8.175	757.06422
Unincorp. County	10,285	127	580.575	17.71520
County	57,516	1,002	648.973	88.62618

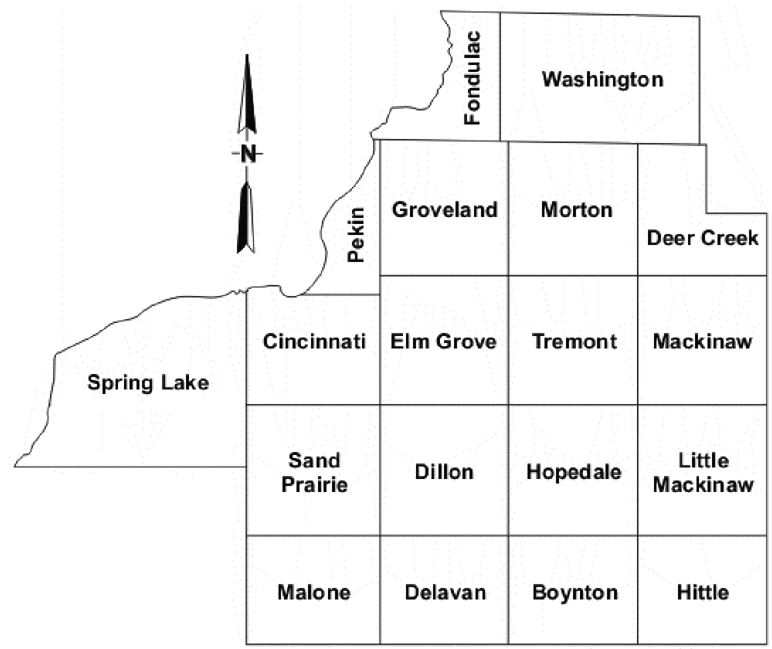
Sources: U. S. Census Bureau.
Tazewell County Community Development Office.

* The total number of mobile homes present in the County was provided by the Tazewell County Community Development and Assessment Offices and based on 2017 tax assessment figures. While a breakdown by participating jurisdiction was not requested, the number was extrapolated from U.S. Census Bureau figures and the information provided by the County.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Tazewell County.

In Tazewell County, as well as many other central Illinois counties, there are pronounced differences in housing unit densities within the County. Approximately 84% of all housing units are located in six of the County's 19 townships (Cincinnati, Fondulac, Groveland, Morton, Pekin and Washington) while approximately 84% of all mobile homes are located in three of the County's 19 townships (Fondulac, Groveland and Morton). **Figure 134** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County.

Figure 134
Township Boundaries Tazewell County



Source: Illinois Secretary of State

This substantial difference in density skews the average *county* housing unit density in Tazewell County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure 135** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 13 of the 19 townships, the *average county* housing unit density is greater (in some cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for five of the six most populated townships.

Estimating the Number of Potentially-Damaged Housing Units

With the average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized tornado. **Figure 136** provides a sample calculation.

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

Figure 135
Average Housing Unit Density by Township – Tazewell County

Township	Total Housing Units (2010)	Mobile Homes (2017)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Boynton	94	0	29.589	3.17686
Cincinnati	3,436	0	30.037	114.39225
Deer Creek	573	0	27.651	20.72258
Delavan	902	6	30.165	29.90220
Dillon	382	0	35.932	10.63119
Elm Grove	1,253	0	36.012	34.79396
Fondulac	6,099	124	17.703	344.51788
Groveland	8,441	333	38.082	221.65327
Hittle	254	7	30.254	8.39558
Hopedale	806	0	35.187	22.90619
Little Mackinaw	678	41	36.383	18.63508
Mackinaw	1,675	43	36.153	46.33087
Malone	95	0	29.682	3.20059
Morton	7,246	385	35.694	203.00331
Pekin	13,321	43	12.495	1,066.10644
Sand Prairie	582	0	35.459	16.41332
Spring Lake	887	0	62.683	14.15057
Tremont	1,043	0	34.957	29.83666
Washington	9,749	20	54.855	177.72309
County	57,516	1,002	648.973	88.62618
Townships – 6 Most Populated	48,292	906	188.866	255.69451
Townships – 13 Least Populated	9,224	96	460.107	20.04751

Sources: U.S. Census Bureau.
Tazewell County Community Development Office.

* The total number of mobile homes present in the County was provided by the Tazewell County Community Development and Assessment Offices and based on 2017 tax assessment figures. While a breakdown by participating jurisdiction was not requested, the number was extrapolated from U.S. Census Bureau figures and the information provided by the County.

Figure 136
Calculation of Potentially-Damaged Existing Housing Units – Tazewell County

Average Housing Unit Density x Area Impacted by the Average-Sized Tazewell County Tornado = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Tazewell County: 88.62618 housing units/sq. mile x 0.19 sq. miles = 16.83897 housing units
(17 housing units)

To calculate the number of potentially-damaged housing units for these municipalities, take the area impacted by the average-sized Tazewell County tornado and divide that by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure 137** provides a sample calculation.

Figure 137 **Sample Calculation of Potentially-Damaged Housing Units** **for Municipalities Covering Less Than One Square Mile - Tremont**
Area Impacted by the Average-Sized Tazewell County Tornado ÷ Land Area within the Jurisdiction = Impacted Land Area Tremont: 0.19 sq. mile ÷ 0.944 sq. miles = 0.201271186 sq. miles Impacted Land Area x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number) Tremont: 0.201271186 sq. miles x 942 housing units = 189.59746 housing units **(190 housing units)**

Occasionally villages and cities will annex large tracts of undeveloped land or have commercial/industrial parks within their corporate limits. In many cases these large tracts of land include very few residential structures. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

In Tazewell County there are three municipalities, East Peoria, Morton and Pekin, that have large, commercial/industrial and undeveloped land areas within their municipal boundaries. These areas account for approximately one-quarter to one-half of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. Therefore, the refined land area figures will be used to calculate the potentially-damages housing units. **Figure 138** provides a breakdown of the land area by municipality.

Figures 139 and **140** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the six most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure 138 Refined Land Area Figures for Participating Municipalities with Large Commercial/Industrial and Undeveloped Land Areas – Tazewell County			
Jurisdiction	**Land Area (Sq. Miles) (2010)**	**Estimated Commercial/Industrial & Open Land Area (Sq. Miles)**	**Refined Land Area (Sq. Miles)**
East Peoria	19.957	6.370	13.587
Morton	12.653	6.130	6.823
Pekin	14.559	3.930	10.619

Figure 139 Estimated Number of Housing Units by Participating Municipality Potentially Damaged by a Tornado – Tazewell County					
Participating Municipality	**Total Housing Units (2010)**	**Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.19 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)**
East Peoria*	10,590	13.587	779.42151	148.09009	149
Morton*	6,973	6.823	1,021.98446	194.17705	195
Pekin*	14,714	10.619	1,385.62953	263.26961	264
Tremont	942	0.944	---	189.59746	190
Washington	6,189	8.175	757.06422	143.84220	144
Unincorp. County	10,285	580.575	17.71520	3.36589	4
County	57,516	648.973	88.62618	16.83897	17

* East Peoria, Morton and Pekin contain large commercial/industrial and undeveloped areas within their municipal boundaries. These areas account for between ¼ and ½ of the land area in the municipalities and skew the potentially-damaged housing unit calculations. In order to provide a more realistic assessment of potentially-damage housing units, these undeveloped areas were subtracted from the land area figure obtained from the U.S. Census Bureau and the refined land area figures are used to calculate potentially-damaged housing units.

What is the level of risk/vulnerability to existing buildings, infrastructure and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

Tazewell County

For Tazewell County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is consider to be low to medium. This assessment is based on the frequency with which tornadoes have occurred in the County and the amount of damage that has been sustained tempered by the differences in population density between the metro area and the rural/agricultural portions of the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

Figure 140
Estimated Number of Housing Units by Township
Potentially Damaged by a Tornado – Tazewell County

Township	Total Housing Units (2010)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.19 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)
Boynton	94	29.589	3.17686	0.60360	1
Cincinnati	3,436	30.037	114.39225	21.73453	22
Deer Creek	573	27.651	20.72258	3.93729	4
Delavan	902	30.165	29.90220	5.68142	6
Dillon	382	35.932	10.63119	2.01993	3
Elm Grove	1,253	36.012	34.79396	6.61085	7
Fondulac	6,099	17.703	344.51788	65.45840	66
Groveland	8,441	38.082	221.65327	42.11412	43
Hittle	254	30.254	8.39558	1.59516	2
Hopedale	806	35.187	22.90619	4.35218	5
Little Mackinaw	678	36.383	18.63508	3.54067	4
Mackinaw	1,675	36.153	46.33087	8.80287	9
Malone	95	29.682	3.20059	0.60811	1
Morton	7,246	35.694	203.00331	38.57063	39
Pekin	13,321	12.495	1,066.10644	202.56022	203
Sand Prairie	582	35.459	16.41332	3.11853	4
Spring Lake	887	62.683	14.15057	2.68861	3
Tremont	1,043	34.957	29.83666	5.66897	6
Washington	9,749	54.855	177.72309	33.76739	34
County	57,516	648.973	88.62618	16.83897	17
Townships – 6 Most Populated	48,292	188.866	255.69451	48.58196	49
Townships – 13 Least Populated	9,224	460.107	20.04751	3.80903	4

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. All of the participating jurisdictions have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes.

However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a *rough estimate* of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Tazewell County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units: In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Tazewell County is approximately one-third of the market value). **Figure 141** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Tazewell County Assessment Office.

There are two villages/cities that straddle the Tazewell-Woodford County Line. For the purposes of this report, these villages/cities will be included in the County where a majority of the municipality resides. Therefore, the assessed value for the portion of Deer Creek that lies within Woodford County was included in the Tazewell County figure and the assessed value for the portion of Goodfield that lies within Tazewell County was included in the Woodford County figures.

Figure 141
Sample Calculation of Average Assessed Value & Average Market Value – East Peoria

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

East Peoria: $307,711,479 ÷ 10,590 housing units = $29,056.79688

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

East Peoria: $29,056.79688 x 3 = $87,170.39065
($87,170)

Figures 142 and **143** provides the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Figure 142
Average Market Value of Housing Units by Participating Municipality – Tazewell County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
East Peoria	$307,711,479	10,590	$29,056.79688	$87,170.39064	$87,170
Morton	$345,125,877	6,973	$49,494.60447	$148,483.81341	$148,484
Pekin	$318,602,708	14,714	$21,653.03167	$64,959.09501	$64,959
Tremont	$34,645,060	942	$36,778.19533	$110,334.58599	$110,335
Washington	$289,130,261	6,189	$46,716.79771	$140,150.39313	$140,150
Unincorp. County	$408,622,464	10,285	$39,729.94302	$119,189.82906	$119,190
County	$1,866,670,119	57,516	$32,454.79726	$97,364.39178	$97,364

Source: Tazewell County Assessments Office.

Damage Scenario: Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted gets complex and provides an additional complication when updating the Plan.

Figure 143
Average Market Value of Housing Units by Township – Tazewell County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Boynton	$1,877,580	94	$19,974.25532	$59,922.76596	$59,923
Cincinnati	$102,880,387	3,436	$29,941.90541	$89,825.71623	$89,826
Deer Creek	$12,130,393	573	$21,169.97033	$63,509.91099	$63,510
Delavan	$18,245,352	902	$20,227.66297	$60,682.98891	$60,683
Dillon	$13,671,699	382	$35,789.78796	$107,369.36388	$107,369
Elm Grove	$49,146,183	1,253	$39,222.81165	$117,668.43495	$117,668
Fondulac	$162,449,213	6,099	$26,635.38498	$79,906.15494	$79,906
Groveland	$275,135,163	8,441	$32,595.09098	$97,785.27294	$97,785
Hittle	$4,977,444	254	$19,596.23622	$58,788.70866	$58,789
Hopedale	$24,836,778	806	$30,814.86104	$92,444.58312	$92,445
Little Mackinaw	$17,868,273	678	$26,354.38496	$79,063.15488	$79,063
Mackinaw	$65,778,770	1,675	$39,270.90746	$117,812.72238	$117,813
Malone	$1,729,220	95	$18,202.31579	$54,606.94737	$54,607
Morton	$361,126,478	7,246	$49,838.04554	$149,514.13662	$149,514
Pekin	$250,040,104	13,321	$18,770.37039	$56,311.11117	$56,311
Sand Prairie	$14,593,773	582	$25,075.21134	$75,225.63402	$75,226
Spring Lake	$21,810,232	887	$24,588.76212	$73,766.28636	$73,766
Tremont	$41,987,072	1,043	$40,256.06136	$120,768.18408	$120,768
Washington	$426,386,005	9,749	$43,736.38373	$131,209.15119	$131,209
Townships – 6 Most Populated	$1,578,017,350	48,292	$32,676.57894	$98,029.73682	$98,030
Townships – 13 Least Populated	$288,652,769	9,224	$31,293.66533	$93,880.99599	$93,881

Source: Tazewell County Assessments Office.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First, the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 144** provides a sample calculation.

Next, the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 145** provides a sample calculation.

Figure 144 ***Structure:*** **Potential Dollar Loss Sample Calculation – East Peoria**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit East Peoria: $87,170 x 100% = $87,170 per housing unit
Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar) East Peoria: $87,170 per housing unit x 101 housing units = $8,804,170

Figure 145 ***Content:*** **Potential Dollar Loss Sample Calculation – East Peoria**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit East Peoria: ½ ($87,170) x 100% = $43,585 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar) East Peoria: $43,585 per housing unit x 101 housing units = $4,402,085

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures 146** and **147** gives a breakdown of the total potential dollar losses by municipality and township.

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Tazewell County would be expected to exceed at least $13 million in any of the participating municipalities.***

<u>*Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities*</u>

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

Figure 146
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Municipality – Tazewell County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
East Peoria	$87,170	101	$8,804,170	$4,402,085	$13,206,255
Morton	$148,484	195	$28,954,380	$14,477,190	$43,431,570
Pekin	$64,959	264	$17,149,176	$8,574,588	$25,723,764
Tremont	$110,335	190	$20,963,650	$10,481,825	$31,445,475
Washington	$140,150	144	$20,181,600	$10,090,800	$30,272,400
Unincorp. County	$119,190	4	$476,760	$238,380	$715,140
County	$97,364	17	$1,655,188	$827,594	$2,482,782

Figure 147
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township – Tazewell County

Township	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Boynton	$59,923	1	$59,923	$29,962	$89,885
Cincinnati	$89,826	22	$1,976,172	$988,086	$2,964,258
Deer Creek	$63,510	4	$254,040	$127,020	$381,060
Delavan	$60,683	6	$364,098	$182,049	$546,147
Dillon	$107,369	3	$322,107	$161,054	$483,161
Elm Grove	$117,668	7	$823,676	$411,838	$1,235,514
Fondulac	$79,906	66	$5,273,796	$2,636,898	$7,910,694
Groveland	$97,785	43	$4,204,755	$2,102,378	$6,307,133
Hittle	$58,789	2	$117,578	$58,789	$176,367
Hopedale	$92,446	5	$462,230	$231,115	$693,345
Little Mackinaw	$79,063	4	$316,252	$158,126	$474,378
Mackinaw	$117,813	9	$1,060,317	$530,159	$1,590,476
Malone	$54,607	1	$54,607	$27,304	$81,911
Morton	$149,514	39	$5,831,046	$2,915,523	$8,746,569
Pekin	$56,607	203	$11,491,221	$5,745,611	$17,236,832
Sand Prairie	$75,226	4	$300,904	$150,452	$451,356
Spring Lake	$73,766	3	$221,298	$110,649	$331,947
Tremont	$120,768	6	$724,608	$362,304	$1,086,912
Washington	$131,209	34	$4,461,106	$2,230,553	$6,691,659
Townships – 6 Most Populated	$98,030	49	$4,803,470	$2,401,735	$7,205,205
Townships – 13 Least Populated	$93,881	4	$375,524	$187,762	$563,286

Tazewell County

Figure 123
(Sheet 1 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
1	11/13/1951	1:15 p.m.	Delavan^ Hopedale^ Minier^	F2	14.9	50	n/a	n/a	$40,000	$25,000	
2	5/26/1955	2:49 p.m.	Pekin	F2	1.5	100	1	n/a	$250,000	n/a	
3	8/13/1956	1:15 a.m.	East Peoria Sunnyland Washington	F3	3.8	27	n/a	n/a	$25,000	n/a	<u>*Sunnyland*</u> - destroyed a building - 2 stores lost their roofs
4	4/16/1960	12:05 p.m.	Delavan^	F1	2.7	60	n/a	n/a	$2,500	n/a	damaged 2 or 3 farmsteads
5	5/16/1960	4:45 p.m.	Pekin Lake North Pekin	F2	0.1	10	n/a	n/a	$25,000	n/a	<u>*North Pekin*</u> - damaged homes
6	5/25/1960	3:10 p.m.	Groveland^	F2	0.1	10	n/a	n/a	$25,000	n/a	took the roofs off several homes
7	9/14/1965	2:40 p.m.	East Peoria	F3	0.5	200	n/a	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois river into Tazewell County before lifting off in East Peoria near the Caterpillar Plant – total length: 5.7 miles							damage and injury information were unavailable				
8	1/24/1967	6:30 p.m.	Washington^	F2	3.3	77	n/a	n/a	$2,500	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Tazewell County southeast of Washington and traveled northeast before lifting off west of Eureka in Woodford County – total length: 3.8 miles							caused some tree and roof damage, especially to farm buildings				
Subtotal:							**1**	**0**	**$370,000**	**$25,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 2 of 12) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
9	10/10/1969	8:00 p.m.	Deer Creek	F2	0.2	200	n/a	n/a	$150,000	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Deer Creek in Tazewell County and traveled east into Woodford County before dissipating – total length: 1.0 miles greatest damage was done to a two-block area in Deer Creek											
10	7/12/1972	9:40 p.m.	Talbott^	F1	0.5	130	n/a	n/a	n/a	$2,500	localized damage sustained
11	9/4/1973	12:20 p.m.	South Pekin^ Midway Pekin Morton	F0	14.6	33	n/a	n/a	n/a	n/a	
12	6/19/1974	6:30 p.m.	Morton^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado was sighted by a pilot near the Village
13	4/18/1975	3:20 p.m.	Hopedale^	F1	0.5	50	n/a	n/a	$25,000	n/a	*Event Description Provided Below*
- destroyed 2 machine sheds on a farm south of the Village - scattered the wreckage of one shed over a large field - carried the other shed about 75 to 100 feet before dropping it and causing little damage											
14	4/30/1975	12:13 p.m.	Armington^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down in a field about 5 ½ miles west-southwest of the Village
15	3/26/1976	9:05 p.m.	Morton	F1	1.5	600	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
<u>*Morton*</u> - several buildings sustained extensive damage, including having large sections of roof torn off in the northwest portion of the Village <u>*Morton area*</u> - several farm gravity wagon boxes were overturned or blown up to 400 feet away onto adjacent properties											
Subtotal:							**0**	**0**	**$425,000**	**$2,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 3 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
16	9/7/1977	4:00 p.m.	Deer Creek	F1	0.2	145	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- approx. 30 homes were damaged in the Westview subdivision on the western edge of the Village - a house under construction was lifted off its foundation, moved slightly and set down again - another residence sustained damage when the attached garage was ripped off and carried across the adjoining yard											
17	9/16/1980	5:25 p.m.	East Peoria Sunnyland	F0	0.8	17	n/a	n/a	n/a	n/a	- about 20 trees were uprooted - the tornado made a 6 ft. high dirt hill
18	6/8/1981	7:18 p.m.	Pekin^ Tremont^	F1	0.1	10	n/a	n/a	$25,000	n/a	tornado touched down between Pekin and Tremont – no damage was reported
19	9/29/1986	2:58 p.m.	Hopedale	F2	2.0	50	n/a	n/a	$275,000	n/a	- destroyed the Hopedale Fire Station - damaged 30 homes - destroyed a garage - toppled or uprooted 100 trees
20	6/2/1987	1:30 p.m.	Mackinaw^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down briefly in open country but caused no damage
21	6/13/1990	7:13 p.m.	Pekin East Peoria	F0	7.0	20	n/a	n/a	$2,500	n/a	- ***this event was part of a federally-declared disaster (Declaration #871)*** - blew down trees one of which fell onto a car
22	6/19/1990	11:20 p.m.	Green Valley	F1	1.0	100	n/a	n/a	$2,500,000	n/a	- ***this event was part of a federally-declared disaster (Declaration #871)*** - several stores in a shopping center were damaged by a fire resulting from the tornado
Subtotal:							**0**	**0**	**$3,052,500**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 4 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
23	11/27/1990	2:13 p.m.	Waddell Airport Talbott[^]	F2	1.0	200	2	0	$1,500,000	n/a	*Waddell Airport* 32 airplanes and 4 hangers were destroyed and others damaged
24	5/14/1991	10:15 a.m.	Minier	F0	0.1	20	n/a	n/a	n/a	n/a	
25	5/14/1991	10:30 a.m.	Hopedale	F0	0.1	20	n/a	n/a	n/a	n/a	
26	5/31/1991	6:42 p.m.	Minier[^]	F0	0.2	50	n/a	n/a	n/a	n/a	
27	10/4/1991	5:09 p.m.	Hopedale[^]	F1	0.4	20	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- ripped the roofs off of several homes - a camping trailer was smashed by an uprooted tree							- destroyed a farm machinery shop - ripped the roof off a warehouse in the Indian Creek Industrial Park and damaged a medical building				
28	5/4/1992	1:50 p.m.	Hopedale[^]	F0	0.1	30	n/a	n/a	$2,500	n/a	damaged trees, power lines and outbuildings
29	8/23/1993	5:45 p.m.	Minier[^]	F1	0.3	20	n/a	n/a	n/a	n/a	a woman photographed a narrow tornado on the ground in an open field
30	6/26/1994	5:33 p.m.	East Peoria	F0	0.25	20	n/a	n/a	n/a	n/a	a TV crew taped a brief tornado touchdown at Spring St.
31	7/20/1994	5:22 p.m.	Powerton Generating Station	F0	0.25	20	n/a	n/a	n/a	n/a	a tornado touched down briefly but caused no damage
32	7/20/1994	5:45 p.m.	Morton[^]	F0	0.25	20	n/a	n/a	n/a	n/a	tornado touched down briefly near I-74 west of the Village
Subtotal:							**2**	**0**	**$1,752,500**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

[^] Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 5 of 12)
Tornado Events
1950 – 2017

<table>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>33</td><td>5/9/1995</td><td>5:04 p.m.</td><td>South Pekin
Pekin^</td><td>F1</td><td>4.0</td><td>220</td><td>2</td><td>0</td><td>$1,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>South Pekin area – south of the Village</u>
- several barns were destroyed
- one house sustained minor damage
- the grill of a pickup truck was impaled by a 2” x 4”
<u>South Pekin</u>
- destroyed a railroad workers’ barracks slightly injuring one worker
- blew over four empty rail cars
- numerous trees were blown over
- several cars were smashed by fallen trees
- three people were trapped in a smashed car but no one was injured
- 4 or 5 garages were destroyed
- part of the roof was missing from a Lutheran church</td></tr>
<tr><td>34</td><td>5/13/1995</td><td>5:15 p.m.</td><td>South Pekin^
Tremont</td><td>F3</td><td>21.1</td><td>880</td><td>2</td><td>0</td><td>$2,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Touchdown/Liftoff – Two Counties</u>
touched down in Mason County north of Goofy Ridge in Sand Ridge State Park and traveled east-northeast into Tazewell County before lifting off east of Tremont – total length: 25.0 miles
- 25 homes were either damaged or destroyed with 7 of the homes destroyed in a subdivision 1 mile south of South Pekin
- 2 people suffered minor injuries from the destruction sustained in a subdivision 1 mile south of South Pekin
- numerous silos and machine sheds were destroyed</td></tr>
<tr><td>35</td><td>4/19/1996</td><td>6:00 p.m.</td><td>Armington</td><td>F2</td><td>4.4</td><td>440</td><td>n/a</td><td>n/a</td><td>$1,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Touchdown/Liftoff – Multiple Counties</u>
touched down in Logan County just south of the Logan/Tazewell County Line (on 1350E) and traveled northeast into Tazewell County and through the south side of Armington before turned southeast and lifting off in McLean County northwest of McLean – total length: 5.2 miles
<u>Armington</u>
- 1 home as well as several outbuildings were destroyed
- 2 homes sustained major damage while 5 homes sustained minor damage</td></tr>
<tr><td colspan="7">Subtotal:</td><td>4</td><td>0</td><td>$4,000,000</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

<table>
<tr><th colspan="12">Figure 123
(Sheet 6 of 12)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>36</td><td>4/30/1997</td><td>2:15 p.m.</td><td>South Pekin^</td><td>F0</td><td>0.5</td><td>50</td><td>1</td><td>0</td><td>$115,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Country View Estates Subdivision</u>
- severely damaged a home under construction causing around $90,000 in damage
- 4 other homes in the area sustained minor roof damage with shingles missing and a garage was damaged
- a 20-inch diameter tree was blown down blocking Bass Road
- a man sustained minor injuries when a piece of sheetrock hit him in the head as he took cover</td></tr>
<tr><td>37</td><td>6/29/1998</td><td>3:45 p.m.</td><td>Marquette Heights
Groveland
Morton</td><td>F1</td><td>9.5</td><td>100</td><td>n/a</td><td>n/a</td><td>$1,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Marquette Heights</u>
- blew down numerous trees and power lines
<u>Groveland area</u>
- numerous homes sustained minor to moderate damage
part of the canopy over the gas pumps at a convenience storm was blown down
<u>Morton (southwest portion)</u>
- a 30-store shopping center sustained considerable damage, with broken windows and half the roof torn off
- a cinema, several restaurants and other businesses sustained moderate damage
- 24 homes sustained moderate damage, mainly to roofs</td></tr>
<tr><td>38</td><td>6/4/1999</td><td>3:25 p.m.</td><td>Delavan</td><td>F1</td><td>2.5</td><td>200</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Delavan</u>
- blew a small outdoor amphitheater into a nearby creek
- knocked down numerous trees
- one tree fell onto an unoccupied truck, another fell onto the roof of a house and still another fell onto a mobile home
- several other homes sustained minor damage to their roofs
- the siding on a few homes was ripped off
<u>Delavan area</u>
- uprooted several more trees and knocked down branches
- destroyed a small shed</td></tr>
<tr><td colspan="7">Subtotal:</td><td>1</td><td>0</td><td>$1,115,000</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 7 of 12) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
39	5/8/2000	9:12 p.m.	Parkland^	F1	0.5	100	n/a	n/a	$275,000	n/a	*Event Description Provided Below*
- destroyed 4 large grain bins - blew a machine shed 100 yards from where it had been - a nearby garage sustained minor damage with siding and a door blown off											
40	5/10/2003	8:45 p.m.	South Pekin Pekin^ Groveland Morton	F3	17.5	440	32	0	$10,000,000	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #1469) *<u>South Pekin area (southwest of the Village)</u>* - several homes were destroyed *<u>South Pekin (eastern portion)</u>* - 50 homes were destroyed - 80 homes sustained minor to moderate damage *<u>Morton</u>* - 8 vehicles were damaged as the tornado crossed the highways - 1 injury was sustained when a car was overturned by the tornado as it crossed I-74 - several 3-story apartment buildings were destroyed and several others were severely damaged in the complex - a couple of businesses were destroyed - over 100 homes were damaged in several subdivisions, some severely											
41	5/10/2003	9:16 p.m.	Morton^ Washington^	F1	1.5	100	n/a	n/a	n/a	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #1469) 3 homes and a business sustained major damage											
42	5/10/2003	9:18 p.m.	Washington^	F0	2.0	100	n/a	n/a	n/a	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #1469) *<u>Touchdown/Liftoff – Two Counties</u>* touched down in Tazewell County southeast of Washington and traveled east into Woodford County where it turned and traveled northeast lifting off north of Roanoke – total length: 12.5 miles - damage a couple of homes and businesses - blew down numerous trees, power poles and power lines											
Subtotal:							**32**	**0**	**$10,275,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 8 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
43	5/28/2003	1:40 p.m.	Washington^	F0	1.5	40	n/a	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> - touched down in Woodford County in Germantown Hills and traveled southeast into Woodford County lifting off north of Washington – total length: 3.5 miles - blew down numerous trees and power lines - destroyed a shed											
44	5/28/2003	2:10 p.m.	Mackinaw^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field
45	5/28/2003	2:41 p.m.	Armington^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field
46	5/30/2003	6:56 p.m.	Delavan^	F0	6.0	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Mason County west of Forest City and traveled southeast into Tazewell County lifting off southwest of Delavan – total length: 14.0 miles - blew down trees and power lines - destroyed several sheds											
47	7/8/2003	2:34 p.m.	Powerton Generating Station^	F0	0.3	20	n/a	n/a	$25,000	n/a	- threw chunks of coal into the air near the power plant - destroyed the roofs on a couple of sheds
48	5/18/2004	4:06 p.m.	East Peoria	F0	0.3	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- tornado touched down about ½ mile west of Fondulac dam and traveled down Coventry Lane for about ¼ mile - damaged large trees with a number of them falling on homes - 2 homes had their roofs lifted off while several others had minor roof damage											
49	5/18/2004	4:12 p.m.	Washington	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down in a field
50	5/30/2004	8:37 a.m.	Green Valley^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field south of Green Valley
51	6/22/2006	7:13 a.m.	Morton^	F0	0.1	30	n/a	n/a	n/a	n/a	tornado briefly touched down in a field 3 miles south of the Village
Subtotal:							**0**	**0**	**$25,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.
^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 9 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
52	1/7/2008	5:22 p.m.	Mackinaw^	EF1	3.0	100	n/a	n/a	$30,000	n/a	*Event Description Provided Below*
- destroyed a pole barn - damaged a house and a few other buildings - blew down a chain link fence and a few tree limbs											
53	6/4/2008	7:18 p.m.	Mackinaw River State Fish & Wildlife Area Lilly^	EF0	1.5	30	n/a	n/a	n/a	n/a	tornado touched down in open fields
54	6/4/2008	7:24 p.m.	Mackinaw River State Fish & Wildlife Area^	EF0	1.75	150	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Multiple Counties touched down in Tazewell County just east of the Mackinaw River State Fish & Wildlife Area and traveled northeast to the Tazewell/McLean County line where it turned to the east-northeast and traveled through the northwest corner of McLean County and into Woodford County before lifting off south-southeast of Congerville – total length: 6.14 miles tornado touched down in open fields and no damage was reported											
Subtotal:							**0**	**0**	**$30,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 10 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
55	6/5/2010	7:51 p.m.	Washington^	EF2	0.8	250	n/a	n/a	$560,000	$30,000	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Tazewell County approx. 3 miles north of Washington and traveled east-northeast into Woodford County lifting off 2 miles south-southeast of Metamora – total length: 3.08 miles							- numerous trees and power poles were snapped along the path of the tornado - 3 large outbuildings and 2 hog sheds were destroyed - the roof of a farm house was lifted off - the roof of another house was severely damaged - a garage was destroyed - a grain bin was blown ¼ mile into a field				
56	11/17/2013	10:53 a.m.	Pekin	EF2	2.1	100	10	0	$45,000,000	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #4157) *Touchdown/Liftoff – Two Counties* touched down in Peoria County 4 miles east-northeast of Mapleton along the Illinois River and traveled northeast into Tazewell County lifting off in Pekin – total length: 2.26 miles							- tornado tracked through the northwest side of the City - approx. 179 houses and 6 businesses suffered major damage - 182 houses experienced minor roof damage - 3 apartment buildings lost their roofs - a power substation experienced minor damage - hundreds of cars sustained damage				
Subtotal:							**10**	**0**	**$45,560,000**	**$30,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 11 of 12) Tornado Events 1950 – 2017											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude (Fujita Scale)**	**Length[1] (Miles)**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
57	11/17/2013	10:59 a.m.	East Peoria Washington	EF4	14.16	880	121	3	$910,000,000	n/a	*Event Description Provided Below*
Subtotal:							**121**	**3**	**$910,000,000**	**$0**	

this event was part of a federally-declared disaster (Declaration #4157)

Touchdown/Liftoff – Multiple Counties

touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties and into Livingston County before lifting off east of Long Point – total length: 46.36 miles

Fatalities/Injuries

- a man in Washington was killed by the tornado
- a woman from Washington died 11 days after the event from multiple serious injuries sustained during the tornado
- a man died six weeks after the event from injuries sustained by the tornado
- 121 people sustained injuries (a breakdown by jurisdiction was not available)
- 5,000 individuals were in the path of the tornado; however, the injuries and fatalities were relatively low due to early warning and the fact that people were either in church or out of town at the time

East Peoria

- estimated damages totaled $110 million
- 20 homes were destroyed
- 75 homes, 7 businesses and 5 apartment buildings suffered major damage
- 137 homes and 3 businesses sustained minor damage
- approx. 400 vehicles were damaged
- thousands of trees and numerous power poles were destroyed

Washington

- estimated damages totaled $800 million
- 633 homes, 7 businesses, 7 apartment buildings and 2,500 vehicles were destroyed
- 280 homes, 2 businesses, several outbuildings and the roof of a school sustained major damage
- 190 homes suffered minor damage
- thousands of trees and power poles snapped

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 12 of 12) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
58	7/16/2015	10:39 p.m.	Delavan	EF2	2.39	250	1	0	$1,200,000	$10,000	*Event Description Provided Below*
- 15 homes sustained severe damage, including either the roofs being completely torn off or the majority of the roof deck being lifted off - 36 homes sustained minor to moderate damage - numerous garages, outbuildings and trees were damaged - grave markers and several trees were damaged in the Prairie Rest Cemetery											
59	8/18/2015	5:09 p.m.	Lilly^ Mackinaw River State Fish & Wildlife Area^	EF0	2.01	75	n/a	n/a	$30,000	$8,000	- damaged several pine trees - downed tree limbs onto 3 houses - damaged crops in a path 50 to 75 yards wide
60	3/7/2017	12:00 a.m.	Green Valley^	EF1	7.38	150	n/a	n/a	$175,000	n/a	*Event Description Provided Below*
- destroyed an outbuilding and an historic single-room schoolhouse 4 miles southwest of Green Valley - damaged 2 grain bins, a barn and several trees along Towerline Road east of Green Valley											
61	3/7/2017	12:09 a.m.	Delavan^	EF2	2.8	200	n/a	n/a	$120,000	n/a	damaged several outbuildings and trees
Subtotal:							**1**	**0**	**$1,525,000**	**$18,000**	
GRAND TOTAL:							**172**	**3**	**$978,130,000**	**$75,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Tazewell County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.4.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Figure 148, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Woodford County. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln have documented 43 occurrences of tornadoes in Woodford County between 1950 and 2017. In comparison, there have been 2,199 tornadoes statewide between 1950 and 2012 according to the most recent Illinois Natural Hazard Mitigation Plan.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2017): ***43***

Highest F-Scale Rating Recorded: ***F4 (July 13, 2004)***

Most Likely Month for Tornadoes to Occur: ***May***

Most Likely Time for Tornadoes to Occur: ***Afternoon / Early Evening***

Average Length of a Tornado: ***2.8 miles***

Average Width of a Tornado: ***107 yards***

Average Damage Pathway of a Tornado: ***0.17 sq. mi.***

Longest Tornado Path in the County: ***20.7 miles (EF 3 November 17, 2013)***

Widest Tornado Path in the County: ***880 yards (EF 3 November 17, 2013***

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Figure 149 charts the reported occurrences of tornadoes by magnitude. Of the 43 reported occurrences there was: one – F4, two – EF3s, eight – F2s, one – EF2, eight – F1s, eighteen – F0s, and five – EF0s.

Figure 150 charts the reported tornadoes by month. Of the 43 events, 27 (63%) took place in May and June making this the peak period for tornadoes in Woodford County. Of those 27 events, 15 (55.5%) occurred during May making this the peak month for tornadoes. In comparison, 1,457 of the 2,199 tornadoes (66%) recorded in Illinois since 1950 took place in April, May and June.

Figure 149
Graph: Tornadoes by Magnitude Woodford County: 1950 – 2017

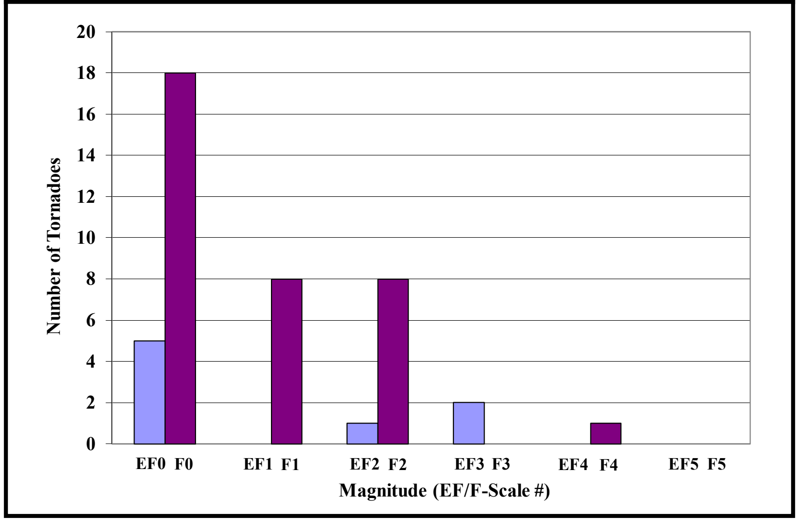


Figure 150
Graph: Tornadoes by Month Woodford County: 1950 – 2017

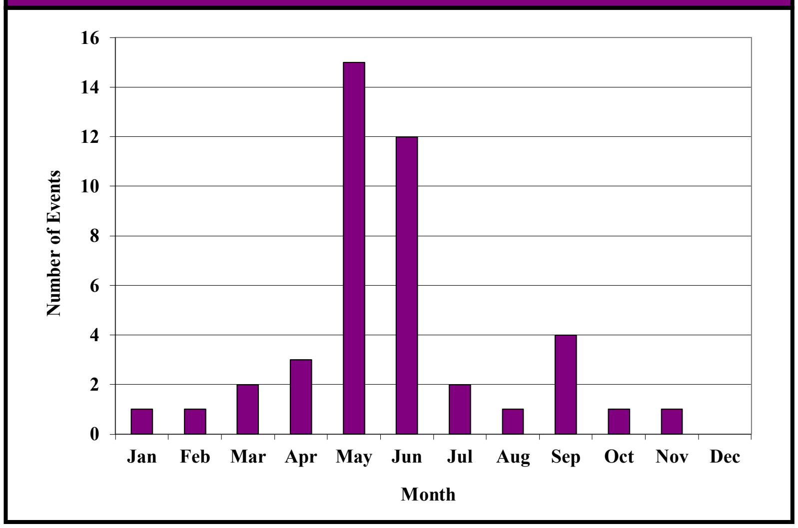
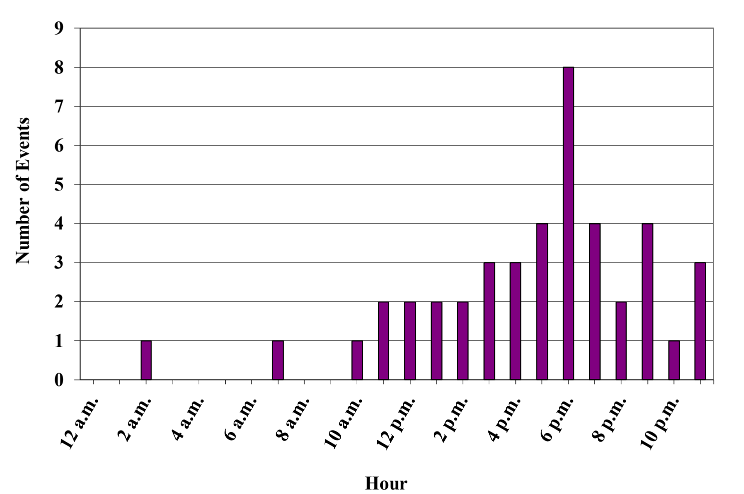


Figure 151 charts the reported tornadoes by hour. Approximately 88% of all tornadoes occurred during the p.m. hours, with 22 of the p.m. events (58%) taking place between 3 p.m. and 8 p.m. In comparison, more than half of all Illinois tornadoes occur between 3 p.m. and 7 p.m.

The tornadoes that have impacted Woodford County have varied from 0.1 miles to 20.7 miles in length and from 10 yards to 880 yards in width. The average length of a tornado in Woodford County is 2.8 miles and the average width is 107 yards (0.061 miles).

Figure 151
Graph: Tornadoes by Hour Woodford County: 1950 – 2017



Figures 152, **153** and **154** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 148**. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Woodford County, the average damage pathway or area impacted by a tornado is 0.17 square miles.

The longest and widest tornado recorded in Woodford County occurred on November 17, 2013. This EF3 tornado, measuring 46.4 miles in length and 880 yards in width, touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties before lifting off east of Long Point in Livingston County. The tornado was on the ground in Woodford County for approximately 20.7 miles. The damage pathway of this tornado covered 23.3 square miles, with approximately 10.4 square miles occurring in Woodford County.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. All of the participating municipalities have had reported occurrences of tornadoes within their corporate limits. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Woodford County's hazard rating for tornadoes as "elevated."

What is the probability of future tornadoes occurring?

Woodford County has had 43 verified occurrences of tornadoes between 1950 and 2017. With 43 tornadoes over the past 68 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is approximately 63%. There were seven years over the last 68 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is approximately 10%.

Figure 152
F0 & EF0 Tornado Touchdowns in Woodford County

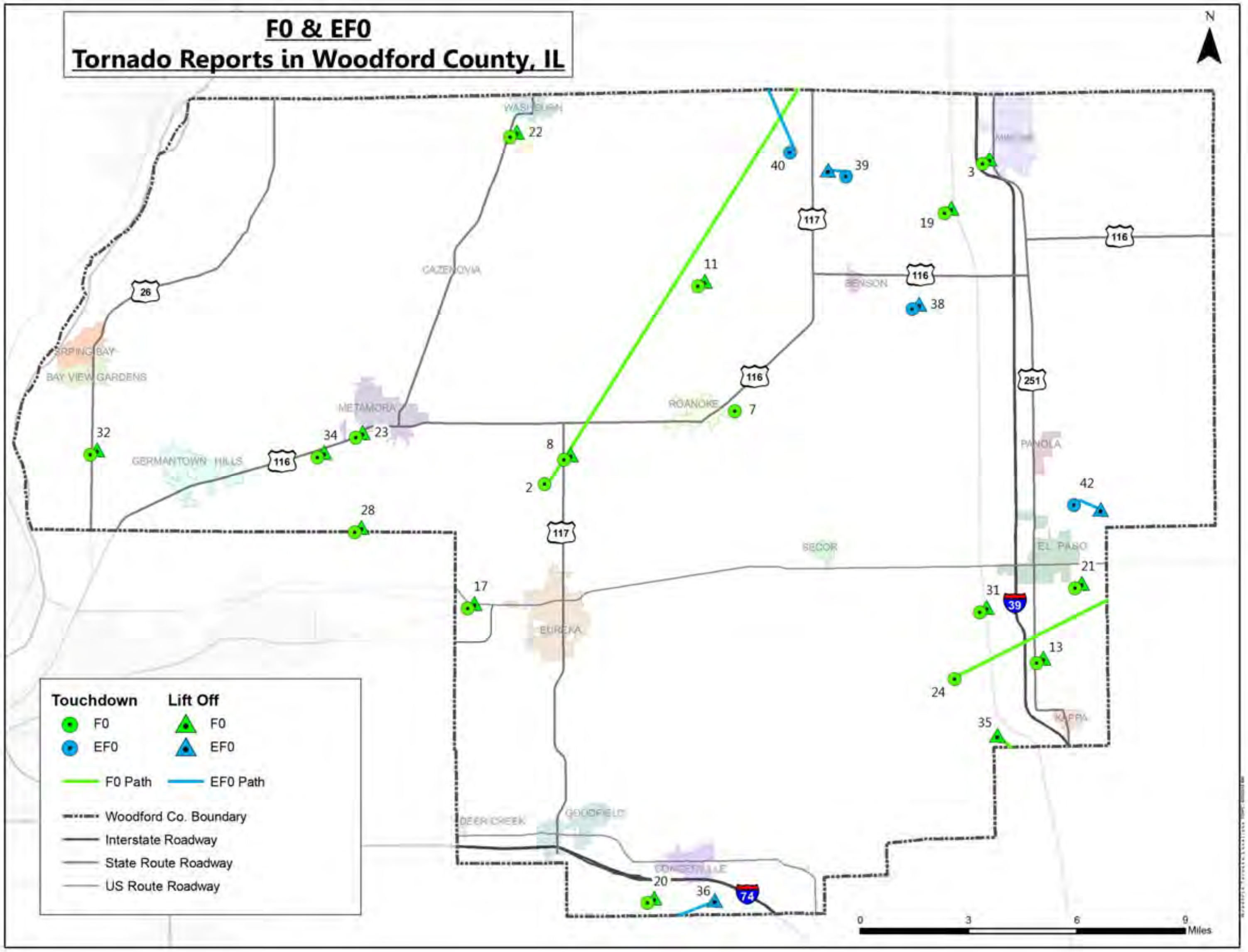


Figure 153
F1 & EF1 Tornado Touchdowns in Woodford County

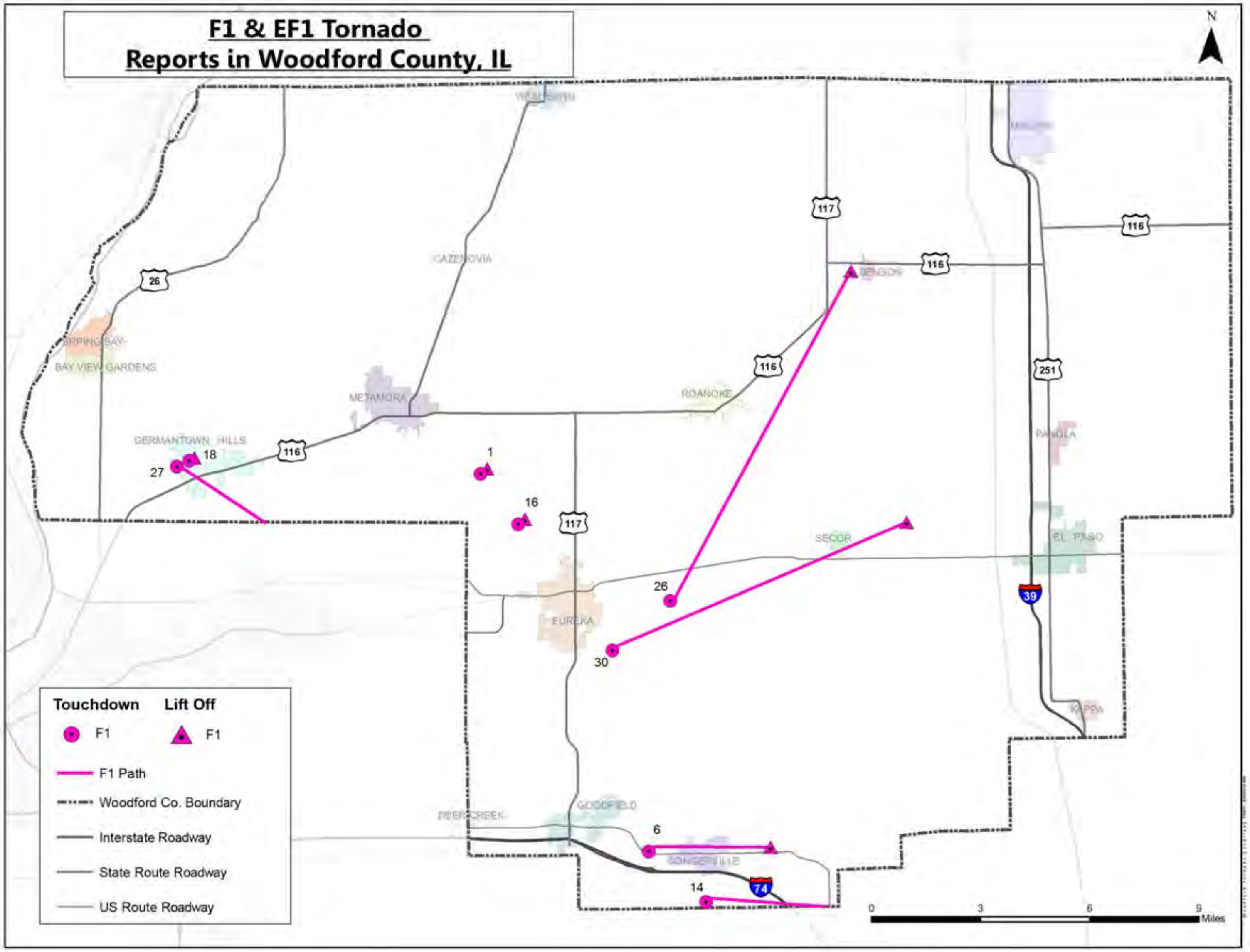
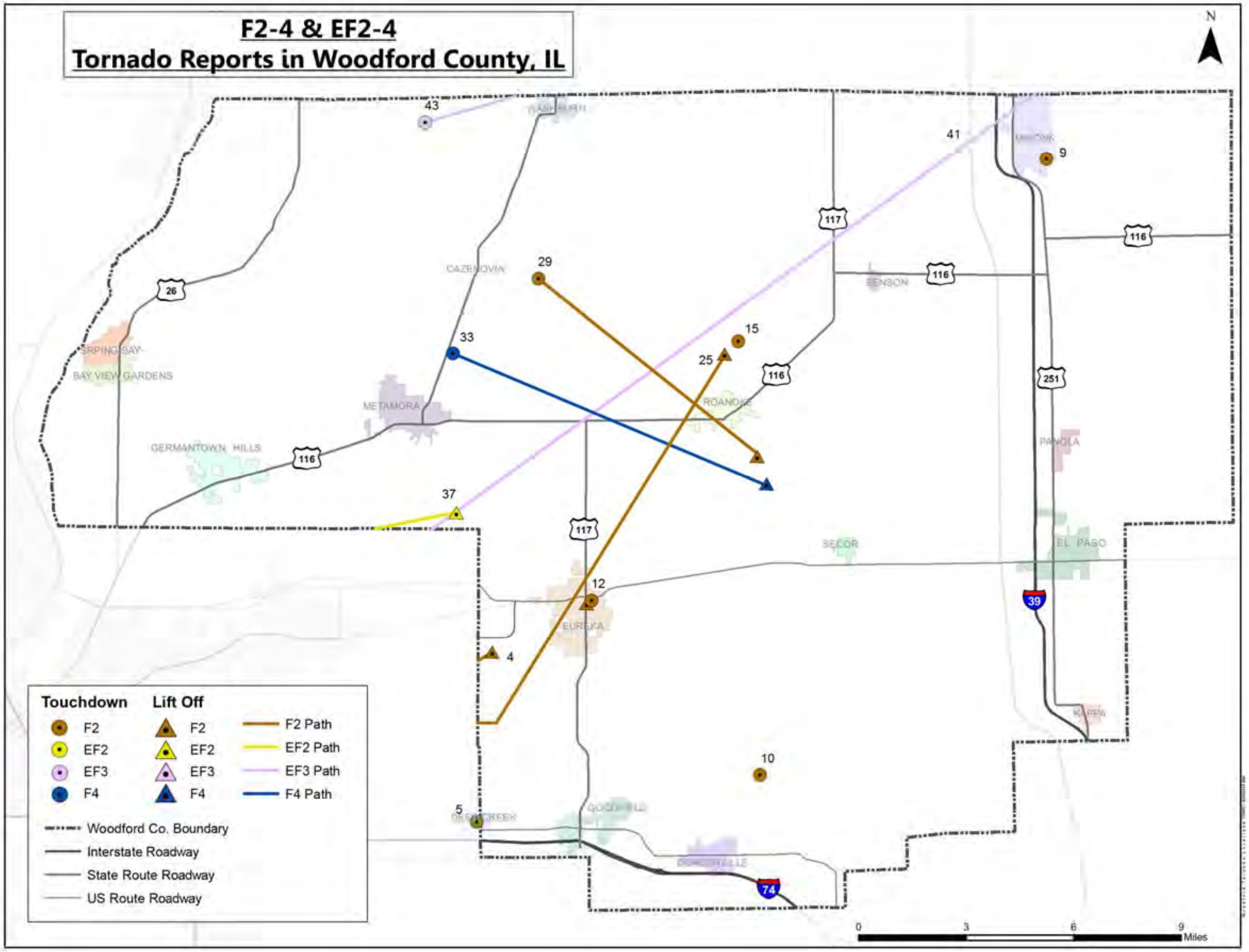


Figure 154
F2 – F4 & EF2 – EF4 Tornado Touchdowns in Woodford County



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Woodford County is vulnerable to the dangers presented by tornadoes. According to NOAA's Storm Events Database and the NWS Weather Forecast Office in Lincoln, a majority of the tornadoes have touched down or passed through the northern and central portion of the County. Since 2008, eight tornadoes have been recorded in Woodford County.

All of the participating municipalities have had a tornado touch down or pass through their municipal boundaries. **Figure 155** lists the verified tornadoes that have touched down in or near or passed through each participating municipality. In terms of unincorporated areas vulnerable to tornadoes, Cazenovia has had one tornado touch down in its vicinity.

Figure 155
Verified Tornadoes in or near Participating Municipalities – Woodford County

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
Eureka	8	1976, 2003	1961, 1967, 1987, 1990, 2003, 2004
Germantown Hills	2	1990, 2003	---
Roanoke	10	2003, 2003	1961, 1971, 1973 1975, 1986, 2003, 2004, 2013

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center, the NWS Weather Forecast Office in Lincoln and Committee member records indicates that between 1950 and 2017, 17 of the 43 tornadoes caused $30.9 million in property damages and $14,250 in crop damages. Included in the property damage total is $2.5 million in damages sustained as a result of the April 13, 1981 tornado and represents losses incurred in two counties (including Woodford County). A breakdown by county was not available. A majority of the property damage total, $25 million, was sustained as a result of the November 17, 2013 EF3 tornado.

Six of the tornadoes have property damage totals of at least $250,000. Property damage information was either unavailable or none was recorded for the remaining 26 reported occurrences.

NOAA's Storm Events Database documented 12 injuries as a result of four tornado events. Detailed information on the injuries and fatalities sustained was only available for two of the events. The following provides a brief description of each.

❖ A teenage boy suffered cuts and bruises when an F0 tornado flipped the car he was driving into a field on May 18, 2000.

- During the November 17, 2013 EF3 tornado, three individuals were injured in overturned semis in the County. Another injury was reported as a result of this tornado but detailed information was unavailable.

In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- Total Property Damage: ***$30,904,250^***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$14,250***
- Injuries: ***12***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability to:
- Public Health & Safety – Rural Areas: ***Low to Medium***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

^ Included in the property damage total is $2.5 million in damages sustained as the result of April 13. 1981 tornado and represents losses incurred in two counties (including Woodford County). A breakdown by county was not available.

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

According to the *2013 Illinois Natural Hazard Mitigation Plan*, Woodford **County ranks in the top 15 counties in Illinois in terms of tornado frequency**. This fact alone suggests that the overall risk posed by tornadoes to public health and safety is relatively high. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

Woodford County

For Woodford County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be low to medium. This assessment is based on the fact that despite their relative frequently, a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. This has contributed to a low number of injuries and fatalities. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.

In terms of adequate access to health care, the County is served by Advocate Eureka Hospital in Eureka which is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted. In addition, there are hospitals in Peru and Ottawa (LaSalle County), Pontiac (Livingston County), Bloomington/Normal (McLean County), the Peoria area

(Tazewell and Peoria Counties) as well as regional centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) which are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Participating Municipalities
In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered high. This is based on the fact that the participating jurisdictions are smaller in size and have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the County and participating municipalities are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures
One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touchdown or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1

The area impacted by an average tornado in Tazewell County = 0.17 sq. miles

Size of Tornado: To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis the area impacted by an average-sized tornado in Woodford County will be used since it has a higher probability of recurring. In Woodford County the area impacted by an average-sized tornado is 0.17 square miles. This average is based on over 60 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Method for Estimating the Area Impacted: Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

This method is quicker, easier and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

Method for Estimating Potentially-Damaged Housing Units: With the size of the tornado calculated and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure 156** provides a sample calculation.

Figure 157 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Woodford County.

Figure 156
Calculation of Average Housing Unit Density – Woodford County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction =
Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Woodford County: 15,145 housing units ÷ 527.801 sq. miles = 28.69453 housing units/sq. miles
(29 housing units)

Figure 157
Average Housing Unit Density by Participating Municipality – Woodford County

Jurisdiction	Total Housing Units (2010)	Mobile Homes (2012-2016 Estimate)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Eureka	2,023	70	3.023	669.20278
Germantown Hills	1,218	38	1.626	749.07749
Roanoke	867	12	0.924	---
Unincorp. County	5,755	226	509.649	11.29209
County	15,145	486	527.801	28.69453

Source: U.S. Census Bureau.

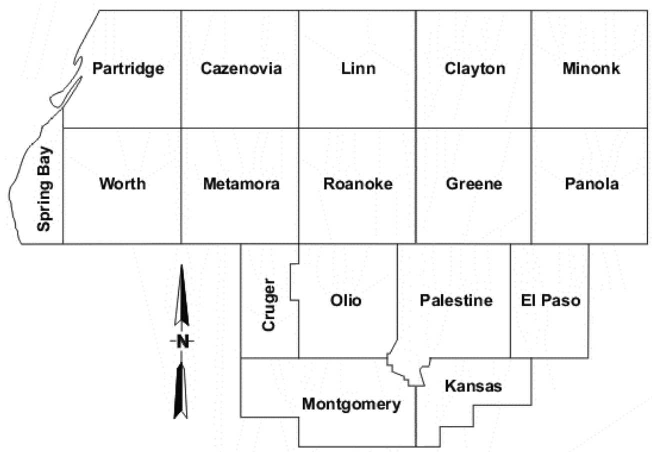
* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2012-2016 5-year estimate is the most recent year for which estimates were available.

In Woodford County, as well as many other central Illinois counties, there are pronounced differences in housing unit densities within the County. Approximately 75% of all housing units are located in seven of the County's 17 townships (El Paso, Metamora, Minonk, Olio, Roanoke, Spring Bay and Worth) while approximately 82% of all mobile homes are located in four of the County's 17 townships (El Paso, Olio, Spring Bay and Worth). **Figure 158** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County.

This substantial difference in density skews the average *county* housing unit density in Woodford County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure 159** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 11 of the 17 townships, the *average county* housing unit density is greater (in some cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for five of the seven most populated townships.

Figure 158
Township Boundaries Woodford County



Source: Illinois Secretary of State

Figure 159
Average Housing Unit Density by Township – Woodford County

Township	Total Housing Units (2010)	Mobile Homes (2012-2016 Estimate)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Cazenovia	721	0	36.151	19.94412
Clayton	300	3	35.813	8.37685
Cruger	593	0	17.041	34.79843
El Paso	1,387	78	24.218	57.27145
Greene	164	0	35.777	4.58395
Kansas	172	0	18.020	9.54495
Linn	117	0	36.618	3.19515
Metamora	1,741	0	36.464	47.74572
Minonk	998	14	36.643	27.23576
Montgomery	873	48	36.189	24.12335
Olio	1,879	70	31.413	59.81600
Palestine	424	11	37.509	11.30395
Panola	144	0	36.445	3.95116
Partridge	243	0	26.214	9.26986
Roanoke	1,044	12	36.812	28.36032
Spring Bay	1,133	99	10.280	110.21401
Worth	3,212	151	36.194	88.74399
County	15,145	486	527.801	28.69453
Townships – 7 Most Populated	11,394	424	212.024	53.73920
Townships – 10 Least Populated	3,751	62	315.777	11.87864

Source: U.S. Census Bureau.

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2012-2016 5-year estimate is the most recent year for which estimates were available.

Estimating the Number of Potentially-Damaged Housing Units

With the average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized tornado. **Figure 160** provides a sample calculation.

Figure 160 **Calculation of Potentially-Damaged Existing Housing Units – Woodford County**
Average Housing Unit Density x Area Impacted by the Average-Sized Woodford County Tornado = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number) Woodford County: 28.69453 housing units/sq. mile x 0.17 sq. miles = 4.87807 housing units **(5 housing units)**

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

To calculate the number of potentially-damaged housing units for these municipalities, take the area impacted by the average-sized Woodford County tornado and divide that by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure 161** provides a sample calculation.

Figure 161 **Sample Calculation of Potentially-Damaged Housing Units** **for Municipalities Covering Less Than One Square Mile – Roanoke**
Area Impacted by the Average-Sized Tazewell County Tornado ÷ Land Area within the Jurisdiction = Impacted Land Area Roanoke: 0.17 sq. mile ÷ 0.924 sq. miles = 0.18398268 sq. miles Impacted Land Area x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number) Roanoke: 0.18398268sq. miles x 867 housing units = 159.51299 housing units **(160 housing units)**

Occasionally villages and cities will annex large tracts of undeveloped land into their corporate limits. In many cases these large tracts of land are often sparsely populated. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these undeveloped areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

In Woodford County Eureka and Roanoke have large sparsely populated open areas within their municipal boundaries. These areas account for approximately one-fifth to one-third of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. Therefore, the refined land area figures will be used to calculate the potentially-damages housing units. **Figure 162** provides a breakdown of the land area by municipality.

Figure 162
Refined Land Area Figures for Participating Municipalities with Large Tracts of Undeveloped Land – Woodford County

Jurisdiction	Land Area (Sq. Miles) (2010)	Estimated Commercial/Industrial & Open Land Area (Sq. Miles)	Refined Land Area (Sq. Miles)
Eureka	3.023	0.670	2.353
Roanoke	0.924	0.320	0.604

Figures 163 and **164** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the six most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure 163
Estimated Number of Housing Units by Participating Municipality Potentially Damaged by a Tornado – Woodford County

Participating Municipality	Total Housing Units (2010)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.17 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)
Eureka*	2,023	2.353	859.75351	146.15810	147
Germantown Hills	1,218	1.626	749.07749	127.34317	128
Roanoke*	867	0.604	---	244.02318	245
Unincorp. County	5,755	509.649	11.29209	1.91966	2
County	15,145	527.801	28.69453	4.87807	5

* Eureka and Roanoke contain large, sparsely populated open areas within its municipal boundaries. These areas account for approximately ⅕ to ⅓ of the land area in the municipalities and skews the potentially-damaged housing unit calculations. In order to provide a more realistic assessment of potentially-damage housing units, these undeveloped areas were subtracted from the land area figure obtained from the U.S. Census Bureau and the refined land area figures are used to calculate potentially-damaged housing units.

Figure 164 Estimated Number of Housing Units by Township Potentially Damaged by a Tornado – Woodford County					
Township	**Total Housing Units (2010)**	**Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.17 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)**
Cazenovia	721	36.151	19.94412	3.39050	4
Clayton	300	35.813	8.37685	1.42406	2
Cruger	593	17.041	34.79843	5.91573	6
El Paso	1,387	24.218	57.27145	9.73615	10
Greene	164	35.777	4.58395	0.77927	1
Kansas	172	18.020	9.54495	1.62264	2
Linn	117	36.618	3.19515	0.54318	1
Metamora	1,741	36.464	47.74572	8.11677	9
Minonk	998	36.643	27.23576	4.63008	5
Montgomery	873	36.189	24.12335	4.10097	5
Olio	1,879	31.413	59.81600	10.16872	11
Palestine	424	37.509	11.30395	1.92167	2
Panola	144	36.445	3.95116	0.67170	1
Partridge	243	26.214	9.26986	1.57588	2
Roanoke	1,044	36.812	28.36032	4.82125	5
Spring Bay	1,133	10.280	110.21401	18.73638	19
Worth	3,212	36.194	88.74399	15.08648	16
County	15,145	527.801	28.69453	4.87807	5
Townships – 7 Most Populated	11,394	212.024	53.73920	9.13566	10
Townships – 10 Least Populated	3,751	315.777	11.87864	2.01937	3

What is the level of risk/vulnerability to existing buildings, infrastructure and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

Woodford County

For Woodford County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is consider to be low to medium. This assessment is based on the frequency with which tornadoes have occurred in the County and the amount of damage that has been sustained tempered by the low population density throughout most of the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have on occasion caused significant damage.

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. While Eureka and Roanoke have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes, the County and Germantown Hills do not. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a ***rough estimate*** of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Woodford County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units: In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Woodford County is approximately one-third of the market value). **Figure 165** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Woodford County Supervisor of Assessments.

Figure 165
Sample Calculation of Average Assessed Value &
Average Market Value – Germantown Hills

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Germantown Hills: $81,900,782 ÷ 1,218 housing units = $67,242.02135

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Germantown Hills: $67,242.02135 x 3 = $201,726.06404
($201,726)

There are two villages/cities that straddle the Woodford-Tazewell County Line. For the purposes of this report, these villages/cities will be included in the County where a majority of the municipality resides. Therefore, the assessed value for the portion of Deer Creek that lies within Woodford County was included in the Tazewell County figure and the assessed value for the portion of Goodfield that lies within Tazewell County was included in the Woodford County figures.

Figures 166 and **167** provides the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Damage Scenario: Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted gets complex and provides an additional complication when updating the Plan.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Figure 166 Average Market Value of Housing Units by Participating Municipality – Woodford County					
Participating Jurisdiction	**Total Assessed Value of Residential Buildings (2016)**	**Total Housing Units (2010)**	**Average Assessed Value (Raw)**	**Average Market Value (Raw)**	**Average Market Value (Rounded)**
Eureka	$58,089,549	2,023	$28,714.55709	$86,143.67127	$86,144
Germantown Hills	$81,900,782	1,218	$67,242.02135	$201,726.06405	$201,726
Roanoke	$22,289,797	867	$25,709.10842	$77,127.32526	$77,127
Unincorp. County	$260,938,760	5,755	$45,341.22676	$136,023.68028	$136,024
County	$585,301,045	15,145	$38,646.48696	$115,939.46088	$115,939

Source: Woodford County Supervisor of Assessments.

Figure 167 Average Market Value of Housing Units by Township – Woodford County					
Participating Jurisdiction	**Total Assessed Value of Residential Buildings (2016)**	**Total Housing Units (2010)**	**Average Assessed Value (Raw)**	**Average Market Value (Raw)**	**Average Market Value (Rounded)**
Cazenovia	$12,075,920	721	$16,748.84882	$50,246.54646	$50,247
Clayton	$6,762,354	300	$22,541.18000	$67,623.54000	$67,624
Cruger	$30,772,391	593	$51,892.73356	$155,678.20068	$155,678
El Paso	$43,124,925	1,387	$31,092.23143	$93,276.69429	$93,277
Greene	$4,897,161	164	$29,860.73780	$89,582.21340	$89,582
Kansas	$7,799,712	172	$45,347.16279	$136,041.48837	$136,041
Linn	$1,625,165	117	$13,890.29915	$41,670.89745	$41,671
Metamora	$66,562,090	1,741	$38,232.10224	$114,696.30672	$114,696
Minonk	$21,466,940	998	$21,509.95992	$64,529.87976	$64,530
Montgomery	$44,562,588	873	$51,045.34708	$153,136.04124	$153,136
Olio	$46,441,522	1,879	$24,716.08409	$74,148.25227	$74,148
Palestine	$12,365,574	424	$29,164.08962	$87,492.26886	$87,492
Panola	$3,281,466	144	$22,787.95833	$68,363.87499	$68,364
Partridge	$9,555,923	243	$39,324.78601	$117,974.35803	$117,974
Roanoke	$26,686,040	1,044	$25,561.34100	$76,684.02300	$76,684
Spring Bay	$41,468,991	1,133	$36,601.05119	$109,803.15357	$109,803
Worth	$205,852,283	3,212	$64,088.50654	$192,265.51962	$192,266
Townships – 7 Most Populated	$451,602,791	11,394	$39,635.14051	$118,905.42153	$118,905
Townships – 10 Least Populated	$133,698,254	3,751	$35,643.36284	$106,930.08852	$106,930

Source: Woodford County Supervisor of Assessments.

<u>*Potential Dollar Losses*</u>

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First, the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 168** provides a sample calculation.

Figure 168 ***Structure:*** **Potential Dollar Loss Sample Calculation – Germantown Hills**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit Germantown Hills: $201,726 x 100% = $201,726 per housing unit
Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)
Germantown Hills: $201,726 per housing unit x 128 housing units = $25,820,928

Next, the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 169** provides a sample calculation.

Figure 169 ***Content:*** **Potential Dollar Loss Sample Calculation – Germantown Hills**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit Germantown Hills: ½ ($201,726) x 100% = $100,863 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)
Germantown Hills: $100,863 per housing unit x 128 housing units = $12,910,464

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures 170** and **171** gives a breakdown of the total potential dollar losses by municipality and township.

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Woodford County would be expected to exceed at least $18 million in either of the participating municipalities***.

Figure 170
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Municipality – Woodford County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Eureka	$86,144	147	$12,663,168	$6,331,584	$18,994,752
Germantown Hills	$201,726	128	$25,820,928	$12,910,464	$38,731,392
Roanoke	$77,127	245	$18,896,115	$9,448,058	$28,344,173
Unincorp. County	$136,024	2	$272,048	$136,024	$408,072
County	$115,939	5	$579,695	$289,848	$869,543

Figure 171
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township – Woodford County

Township	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Cazenovia	$50,247	4	$200,988	$100,494	$301,482
Clayton	$67,624	2	$135,248	$67,624	$202,872
Cruger	$155,678	6	$934,068	$467,034	$1,401,102
El Paso	$93,277	10	$932,770	$466,385	$1,399,155
Greene	$89,582	1	$89,582	$44,791	$134,373
Kansas	$136,041	2	$272,082	$136,041	$408,123
Linn	$41,671	1	$41,671	$20,836	$62,507
Metamora	$114,696	9	$1,032,264	$516,132	$1,548,396
Minonk	$64,530	5	$322,650	$161,325	$483,975
Montgomery	$153,136	5	$765,680	$382,840	$1,148,520
Olio	$74,148	11	$815,628	$407,814	$1,223,442
Palestine	$87,492	2	$174,984	$87,492	$262,476
Panola	$68,364	1	$68,364	$34,182	$102,546
Partridge	$117,974	2	$235,948	$117,974	$353,922
Roanoke	$76,684	5	$383,420	$191,710	$575,130
Spring Bay	$109,803	19	$2,086,257	$1,043,129	$3,129,386
Worth	$192,266	16	$3,076,256	$1,538,128	$4,614,384
Townships – 7 Most Populated	$118,905	10	$1,189,050	$594,525	$1,783,575
Townships – 10 Least Populated	$106,930	3	$320,790	$160,395	$481,185

Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

Woodford County

Figure 148
(Sheet 1 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
1	5/28/1954	6:15 p.m.	Metamora^	F1	0.1	10	n/a	n/a	$25,000	n/a	
2	5/14/1961	8:15 p.m.	Eureka^ Roanoke^	F0	12.8	10	n/a	n/a	$250	n/a	
3	8/1/1961	12:44 p.m.	Minonk^	F0	0.1	10	n/a	n/a	n/a	$2,500	tornado leveled about 60 rows of corn
4	1/24/1967	6:30 p.m.	Eureka^	F2	0.5	77	n/a	n/a	n/a	n/a	*Touchdown/Liftoff – Two Counties* touched down in Tazewell County southeast of Washington and traveled northeast before lifting off west of Eureka in Woodford County – total length: 3.8 miles
5	10/10/1969	8:00 p.m.	Goodfield^	F2	0.8	200	n/a	n/a	n/a	n/a	*Touchdown/Liftoff – Two Counties* touched down in Deer Creek in Tazewell County and traveled east into Woodford County before dissipating – total length: 1.0 miles
6	5/9/1970	7:20 p.m.	Congerville^	F1	2.7	200	n/a	n/a	$250,000	n/a	damaged trees, utility lines, barns, silos and one mobile home
7	6/15/1971	6:20 p.m.	Roanoke^	F0	1.5	30	n/a	n/a	$250	$250	tornado moved west-northwest touching the ground briefly and disturbing crops in a few places
Subtotal:							**0**	**0**	**$275,500**	**$2,750**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 2 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8	6/18/1973	2:10 p.m.	Roanoke[^]	F0	0.1	10	n/a	n/a	$5,000	n/a	<u>*Roanoke area*</u> - tore the roof from a shed - struck the top of a grain elevator
9	6/19/1974	2:30 a.m.	Minonk	F2	1.0	20	n/a	n/a	$250	n/a	*Event Description Provided Below*
- one building suffered structural damage - damaged windows and trees in a narrow area - lifted 3 grain bins off their concrete foundations											
10	6/22/1974	7:08 a.m.	Congerville[^]	F2	0.8	100	n/a	n/a	$25,000	$2,500	- tornado touched down northeast of the Village and moved northeast - destroyed a barn - damaged farm buildings and crops
11	5/25/1975	10:25 p.m.	Roanoke[^]	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down briefly in an open field but no damage occurred
12	3/26/1976	9:30 p.m.	Eureka	F2	0.5	33	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- damaged roofs and windows on a number of homes - uprooted and snapped several trees - the roof of a home was lifted and carried over to the next block and the walls were bowed out											
13	6/29/1976	3:00 p.m.	El Paso[^]	F0	0.5	50	n/a	n/a	n/a	$2,500	- tornado cut a swath through corn and soybean fields 2 miles south of the City - crops were torn up and flattened
Subtotal:							**0**	**0**	**$280,250**	**$5,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

[^] Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 3 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
14	4/13/1981	11:10 p.m.	Congerville^	F1	8.3	150	n/a	n/a	$2,500,000‡	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Woodford County south-southeast of Congerville and traveled east-southeast before lifting off at Colfax in McLean County – total length: 34.5 miles - damaged barns, outbuildings and homes - pulled electrical poles out of the ground											
15	9/24/1986	5:15 p.m.	Roanoke^	F2	2.5	75	n/a	n/a	$250,000	$2,500	- damaged 3 farm houses and several rural structures - severed seven, 65-foot power poles along the tornado's path
16	5/20/1987	5:43 p.m.	Eureka^	F1	0.5	50	n/a	n/a	$2,500	n/a	- destroyed a barn, scattering lumber across fields - flying debris damaged a nearby farm house
17	6/13/1990	7:57 p.m.	Eureka^	F0	0.1	50	n/a	n/a	n/a	n/a	tornado touched down briefly
18	6/22/1990	6:00 p.m.	Germantown Hills	F1	0.5	50	n/a	n/a	$25,000	n/a	damaged the water district building and a garage roof
19	4/29/1991	6:45 p.m.	Minonk^	F0	0.2	100	n/a	n/a	n/a	n/a	
20	5/13/1995	6:10 p.m.	Congerville^	F0	0.1	10	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- damaged 1 home and 5 outbuildings - the roof was blown off a mobile home - several trees and power lines were blown over											
Subtotal:							**0**	**0**	**$2,777,500‡**	**$2,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

‡ The $2.5 million in property damages sustained as a result of the April 13, 1981 tornado represent losses sustained in two counties (including Woodford County). A detailed breakdown by county was not available.

Woodford County

Figure 148
(Sheet 4 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
21	6/26/1995	5:27 p.m.	El Paso^	F0	0.1	10	n/a	n/a	n/a	n/a	- twisted a trampoline around a tree - threw a swing set 40 to 50 feet - blew down a tree
22	6/4/1999	3:23 p.m.	Washburn^	F0	0.3	20	n/a	n/a	n/a	n/a	- a home sustained extensive roof damage when several nearby trees fell onto it - blew down several trees at the Snag Creek Golf Course
23	5/18/2000	4:18 p.m.	Metamora^	F0	0.2	20	1	0	$5,000	n/a	*Event Description Provided Below*
- tornado touched down west of the Village just south of IL Rte. 116 - flipped the car of a teenage boy driving through the area several times into a field - the driver only suffered cuts and bruises but his 1997 Cavalier was totaled											
24	5/8/2002	11:32 p.m.	El Paso^	F0	4.5	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Woodford County near the intersection of County Road 700N and 2500E southwest of El Paso and traveled northeast before lifting off in the extreme northwestern corner of McLean County southwest of Gridley – total length: 5.5 miles - knocked power poles down											
Subtotal:							**1**	**0**	**$5,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148 (Sheet 5 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
25	5/10/2003	9:21 p.m.	Eureka Roanoke	F2	10.5	300	4	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Tazewell County southeast of Washington and traveled east into Woodford County where it turned to the northeast and traveled through the northwestern portions of Eureka and Roanoke before lifting off north of Roanoke – total length: 12.5 miles <u>*Eureka area*</u> - destroyed several homes, outbuildings and businesses along US 24 <u>*Eureka*</u> - clipped the northwestern side of the City damaging several homes <u>*Unincorporated Woodford County*</u> - additional homes sustained damage as well as shed and outbuildings - trees, power lines and power poles sustained damage <u>*Roanoke area*</u> - several homes suffered damage											
26	5/10/2003	9:25 p.m.	Eureka^ Secor^ Roanoke^ Benson^	F1	8.0	200	n/a	n/a	n/a	n/a	- blew down numerous trees and power lines - destroyed several barns and outbuildings - a couple of homes sustained minor damage
27	5/28/2003	1:40 p.m.	Germantown Hills	F1	2.0	100	n/a	n/a	n/a	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #1469) <u>*Touchdown/Liftoff – Two Counties*</u> touched down in Woodford County in Germantown Hills and traveled southeast into Woodford County lifting off north of Washington – total length: 3.5 miles - damaged a house, pushing the front door open and blowing the back wall of the house out about 15 inches - blew down numerous trees and power lines											
Subtotal:							**4**	**0**	**$0**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

<table>
<tr><th colspan="12">Figure 148
(Sheet 6 of 10)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>28</td><td>5/28/2003</td><td>1:58 p.m.</td><td>Metamora^</td><td>F0</td><td>0.1</td><td>10</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field 3 miles southwest of Metamora near the Woodford/Tazewell County Line</td></tr>
<tr><td>29</td><td>5/30/2003</td><td>6:53 p.m.</td><td>Cazenovia^
Roanoke</td><td>F2</td><td>7.3</td><td>150</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>Unincorporated Woodford County (southeast of Cazenovia)</u>
- several homes sustained major damage
- several sheds were destroyed
- numerous trees, tree limbs, power lines and power poles were blown down</td><td colspan="5"><u>Roanoke</u>
- the tornado weakened quite a bit by the time it approached the Village and only minor tree damage was reported</td></tr>
<tr><td>30</td><td>5/30/2004</td><td>4:05 p.m.</td><td>Eureka^
Secor</td><td>F1</td><td>9.0</td><td>75</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>southwest of Secor 3 miles</u>
- destroyed 2 farm buildings, a grain bin and a corn crib
- blew down numerous trees</td><td colspan="5">- destroyed 2 old farm buildings
- moved hay bales and threw a medium-sized gas tank ½ mile into a field</td></tr>
<tr><td>31</td><td>6/10/2004</td><td>4:55 p.m.</td><td>El Paso^</td><td>F0</td><td>0.1</td><td>10</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field 2 miles southwest of the City and no damage or injuries were reported</td></tr>
<tr><td>32</td><td>7/5/2004</td><td>9:40 p.m.</td><td>Bay View Gardens^</td><td>F0</td><td>0.1</td><td>10</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field 2 miles south of the Village and no damages or injuries were reported</td></tr>
<tr><td colspan="7">Subtotal:</td><td>0</td><td>0</td><td>$0</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 7 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
33	7/13/2004	2:34 p.m.	Metamora^ Roanoke^	F4	9.6	440	3	n/a	n/a	n/a	*Event Description Provided Below*
CR 1400E & IL Rte. 116/117 - struck the Parson's Company severely damaging the manufacturing plant - approx. 140 people were in the plant at the time, but all personnel made it to storm shelters in time - steel beams and metal siding from the plant were found approx. ¾ mile east in a farm field *south of IL Rte. 116/117 & east of CR 1400E* - destroyed two 2-story houses on 2 separate farmsteads, with only debris remaining in the basements and nearby property - significantly damaged two 2-story houses on another 2 farmsteads and demolished outbuildings *CR 1300 N & 1600E intersection* - significantly damaged a barn *near CR 1300N and 1700E intersection* - damaged a house											
34	3/30/2005	3:06 p.m.	Metamora^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field and no damages or injuries were reported
35	4/2/2006	6:13 p.m.	Kappa^	F0	0.3	50	n/a	n/a	n/a	n/a	*Touchdown/Liftoff – Two Counties* touched down in McLean County north-northwest of Hudson and traveled into Woodford County lifting off southwest of Kappa – total length: 0.5 miles
Subtotal:							**3**	**0**	**$0**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.
^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

<table>
<tr><th colspan="12">Figure 148
(Sheet 8 of 10)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>36</td><td>6/4/2008</td><td>7:39 p.m.</td><td>Congerville^</td><td>EF0</td><td>0.71</td><td>150</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>*Event Description Provided Below*</td></tr>
<tr><td colspan="8"><u>*Touchdown/Liftoff – Two Counties*</u>
touched down in Tazewell County approx. 3 miles north of Washington and traveled east-northeast into Woodford County lifting off 2 miles south-southeast of Metamora – total length: 3.08 miles</td><td colspan="4">- several trees were snapped
- 5 power poles were damaged
- the metal roof of a barn was lifted off
- windows were broken on a house</td></tr>
<tr><td>37</td><td>6/5/2010</td><td>7:53 p.m.</td><td>Metamora^</td><td>EF2</td><td>2.28</td><td>250</td><td>n/a</td><td>n/a</td><td>$70,000</td><td>n/a</td><td>*Event Description Provided Below*</td></tr>
<tr><td>38</td><td>9/1/2012</td><td>10:48 a.m.</td><td>Benson^</td><td>EF0</td><td>0.06</td><td>20</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field 2 miles east-southeast of the Village and no damage was reported</td></tr>
<tr><td>39</td><td>9/1/2012</td><td>11:03 p.m.</td><td>Benson^</td><td>EF0</td><td>0.69</td><td>20</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado touched down in a field 3 miles north of the Village and traveled west across CR 2200E before dissipating and no damage was reported</td></tr>
<tr><td>40</td><td>9/1/2012</td><td>11:05 a.m.</td><td>Benson^</td><td>EF0</td><td>1.75</td><td>75</td><td>n/a</td><td>n/a</td><td>$1,000</td><td>$4,000</td><td>*Event Description Provided Below*</td></tr>
<tr><td colspan="8"><u>*Touchdown/Liftoff – Two Counties*</u>
touched down in Tazewell County approx. 4 miles north-northwest of Benson and traveled northwest into Marshall County lifting off ¾ mile southeast of Pattonsburg – total length: 2.25 miles</td><td colspan="4">- tore the tin roof off a shed
- caused minor damage to a corn field</td></tr>
<tr><td colspan="7">**Subtotal:**</td><td>**0**</td><td>**0**</td><td>**$71,000**</td><td>**$4,000**</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 9 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
41	11/17/2013	11:12 a.m.	Metamora^ Roanoke^ Benson^ Minonk^	EF3	20.7	880	4	0	$25,000,000	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #4157) *Touchdown/Liftoff – Multiple Counties* touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties and into Livingston County before lifting off east of Long Point – total length: 46.36 miles - during much of the time the tornado was on the ground in Woodford County, it traveled across open field, impacting dozens of farmsteads - destroyed 7 homes and nearly 70 farm buildings - 17 homes sustained major damage - 23 others suffered minor damage - approx. 100 vehicles were damaged, including several semi-trucks at a truck stop north of Minonk - 3 individuals were injured in overturned semi-trucks - a cell tower was toppled and hundreds of power poles and trees were snapped											
42	5/28/2014	12:40 p.m.	El Paso^	EF0	0.61	100	n/a	n/a	n/a	n/a	tornado touched down in a field 1.9 miles north-northeast of El Paso traveling southeast and no damage was reported
Subtotal:							**4**	**0**	**$25,000,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148 (Sheet 10 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
43	2/28/2017	5:26 p.m.	Washburn[^]	EF3	3.36	400	n/a	n/a	$2,250,000	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Multiple Counties touched down in Tazewell County 3 ½ miles west of Washburn and traveled northeast through Marshall County and into LaSalle County before lifting off at Rutland – total length: 17.76 miles - MAC member identified $750,000 in damages to 4 homes and outbuildings as a result of this event							*approx. 2 ½ miles west of Washburn* - destroyed a house - destroyed several outbuildings - broke windows and did roof damage to a house *approx. 1 ½ miles west of Washburn* - tore the roof off a house *Washburn* - damaged 8 houses - roofs, garages, vehicles and trees sustained significant damage				
Subtotal:							**0**	**0**	**$2,250,000**	**$0**	
GRAND TOTAL:							**12**	**0**	**$30,904,250[‡]**	**$14,250**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

[^] Tornado touchdown verified in the vicinity of this location(s).

[‡] There was one event that occurred on April 13, 1981 where $2.5 million in property damages was sustained and represent losses sustained in two counties (including Woodford County). A detailed breakdown by county was not available.

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Woodford County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tri-County MAC Member responses to the Natural Hazard Events Questionnaire.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.4.3 PARTICIPATING PEORIA COUNTY JURISDICTIONS

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2017): ***4***

Highest F-Scale Rating Recorded: ***F3 (September 14, 1965)***

Most Likely Month for Tornadoes to Occur: ***June***

Longest Tornado Path in the County: ***5.2 miles (F 3 September 14, 1965)***

Widest Tornado Path in the County: ***200 yards (F 3 September 14, 1965)***

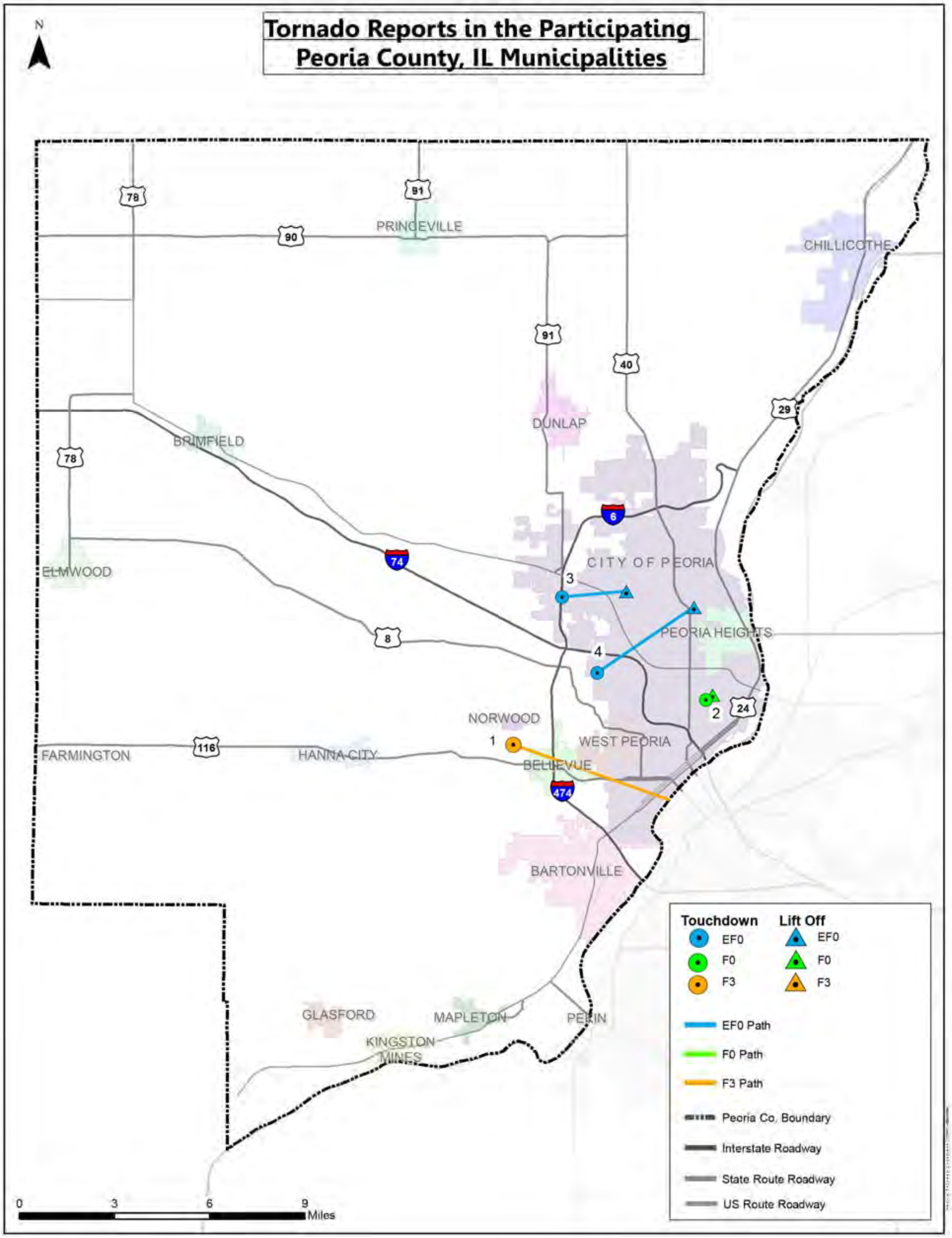
Figure 172, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in the participating Peoria County jurisdictions. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center, the NWS Weather Forecast Office in Lincoln and news articles have documented four occurrences of tornadoes in the participating Peoria County jurisdictions between 1950 and 2017. In comparison, Peoria County as a whole has experienced 26 tornadoes between 1950 and 2017. According to the most recent Illinois Natural Hazard Mitigation Plan, there have been 2,199 tornadoes statewide between 1950 and 2012.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Of the four reported occurrences there was: one – F3, one – F0, and two EF0s. Two of the four reported tornadoes (50%) occurred in June while all four of the events occurred during the p.m. hours. The tornadoes that have impacted participating Peoria County jurisdictions have varied from 0.1 miles to 5.2 miles in length and from 10 yards to 200 yards in width. **Figure 173** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 172**.

The longest and widest tornado recorded in participating Peoria County jurisdictions occurred on September 14, 1965. This F3 tornado, measuring 5.7 miles in length and 200 yards in width, touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois River into Tazewell County before lifting off in East Peoria. The tornado was on the ground in Peoria County for approximately 5.2 miles.

Figure 172
Tornado Touchdowns in Participating Peoria County Jurisdictions



What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. Two of the five participating municipalities, Peoria and Peoria Heights, have had reported occurrences of tornadoes within their corporate limits. While tornadoes have occurred in the GPSD's service area, none have directly impacted the main wastewater treatment facility in Peoria. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Peoria County's hazard rating for tornadoes as "high."

What is the probability of future tornadoes occurring?

Peoria

The City of Peoria has had four verified tornadoes touch down or pass through its municipal boundaries between 1950 and 2017. With four tornado events impacting the City over the past 68 years, the probability or likelihood that a tornado will touch down or pass through the City in any given year is approximately 6%.

Peoria Heights

Peoria Heights has had one verified occurrence of a tornado between 1950 and 2017. With one tornado event impacting the Village over the past 68 years, the probability or likelihood that a tornado will touch down or pass through the Village in any given year is approximately 1%.

GPSD

While the GPSD's main wastewater treatment facility in Peoria has not been directly impacted by a tornado, four verified tornadoes have touch down or pass through its service area between 1950 and 2017. With four tornadoes impacting the District's service area over the past 68 years, the probability or likelihood that a tornado will touch down or pass through the District's service area in any given year is approximately 6%.

Bartonville/Chillicothe/Hanna City

Bartonville, Chillicothe and Hanna City have not had a tornado touch down or pass through their municipal boundaries between 1950 and 2017. With no recorded events during the past 68 years, it makes it difficult to specifically establish the probability that a tornado will impact the jurisdictions in any given year; however, it is estimated to be low.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions and identifies the impacts on public health and property (if known).

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of the participating Peoria County jurisdictions are vulnerable to the dangers presented by tornadoes. Two of the five participating municipalities, Peoria and Peoria Heights, have had a tornado touch down or pass through their municipal boundaries. While tornadoes have occurred in the GPSD's service area, none have directly impacted the main wastewater treatment facility in Peoria. Since 2008, two tornadoes have been recorded in the participating jurisdictions.

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln indicates that between 1950 and 2017, three of the four tornadoes caused $2.86 million in property damages. Property damage information was either unavailable or none was recorded for the remaining reported occurrence.

NOAA's Storm Events Database documented 30 injuries as a result of one tornado event. Detailed information on the injuries sustained was not available for the event. In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- Total Property Damage: ***$2,860,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***30***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability to:
- Public Health & Safety: ***High***
- Buildings/Infrastructure/Critical Facilities: ***High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

In general, if a tornado were to touchdown or pass through any of the participating jurisdictions the risk to the public health and safety would be considered high. This is based on the fact that the participating jurisdictions have relatively dense and evenly distributed populations within their corporate boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these jurisdictions it will have a greater likelihood of causing injuries or even fatalities.

Do any participating jurisdictions have community safe rooms?

No. None of the participating jurisdictions have community safe rooms. As a result, if a tornado were to touch down or pass through any of the population centers in the participating jurisdictions, then there would be a greater likelihood of injuries and fatalities due to the lack of structures specifically designed and constructed to provide life-safety protection. Each jurisdiction should consider whether the potential impacts to public health and safety from a tornado are considered great enough to warrant the consideration of community safe rooms as mitigation measures.

While not considered community safe rooms built to standard, the GPSD has identified several sites at its main wastewater treatment facility where employees can take shelter during a tornado event. These sites are located in reinforced concrete structures that have one to two story basements.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the participating jurisdictions are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

In general, if a tornado were to touchdown or pass through any of the participating jurisdictions the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the jurisdictions where wide expanses of open spaces generally do not exist. As a result, if a tornado were to touch down within any of the jurisdictions it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. All of the participating jurisdictions have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. With only four tornadoes impacting just two of the five participating municipalities and the GPSD's service area over the last 68 years, there is insufficient information available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from tornadoes. However, since all existing structures within the participating jurisdictions are vulnerable to damage, it is highly likely that there will be future dollar losses if a tornado touches down or passes through any of the participating jurisdictions.

Participating Peoria County Jurisdictions

<table>
<tr><th colspan="12">Figure 173
(Sheet 1 of 2)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)*</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>1</td><td>9/14/1965</td><td>2:40 p.m.</td><td>Norwood^
Bellevue^
Peoria</td><td>F3</td><td>5.2</td><td>200</td><td>30</td><td>0</td><td>$2,500,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Touchdown/Liftoff – Two Counties</u>
touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois river into Tazewell County before lifting off in East Peoria – total length: 5.7 miles
3 individuals were hospitalized with others less seriously injured
<u>Norwood/Bellevue area</u>
- destroyed most of the Norwood Grade School
- ripped apart the hospital wing at Bel-Wood Nursing Home
- tore through isolated farmland
<u>Peoria</u>
- lifted a ventilator from the roof at Manuel High School and damaged the gym roof
- tore up the business/manufacturing district along SW Adams & SW Washington Streets including the Peoria Union Stock Yards, the Coca-Cola Bottling Co. plant and Hiram Walker & Sons Inc. whiskey distillery
- 3 homes sustained major damage
- numerous trees, utility lines and roofs were damaged</td></tr>
<tr><td>2</td><td>6/8/1974</td><td>5:15 p.m.</td><td>Peoria</td><td>F0</td><td>0.1</td><td>10</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td></td></tr>
<tr><td>3</td><td>6/5/2010</td><td>7:32 p.m.</td><td>Peoria</td><td>EF0</td><td>2.02</td><td>100</td><td>n/a</td><td>n/a</td><td>$100,000</td><td>n/a</td><td>- numerous trees were snapped
- several homes experienced shingle damage</td></tr>
<tr><td colspan="7">Subtotal:</td><td>30</td><td>0</td><td>$2,600,000</td><td>$0</td><td></td></tr>
</table>

* Unless otherwise noted, the GPSD service area is included as part of any location listing for Bellevue, Peoria and Peoria Heights.

[1] The length provided is only for the portion(s) of the tornado that occurred in Peoria County.

^ Tornado touchdown verified in the vicinity of this location(s).

Participating Peoria County Jurisdictions

Figure 173 (Sheet 2 of 2) Tornado Events 1950 – 2017											
Map No.	**Date(s)**	**Start Time**	**Location(s)***	**Magnitude (Fujita Scale)**	**Length[1] (Miles)**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
4	3/15/2016	7:14 p.m.	Peoria Peoria Heights	EF0	3.68	200	n/a	n/a	$260,000	n/a	*Event Description Provided Below*
Peoria - damaged the roof, gutters, soffits and ceiling tiles of the St. Frances Wood Supportive Living Center near W. Richwoods Blvd. and N. Molleck Dr. - roofs and trees damaged near N. University St. and W. Christine Ave. - damaged the Farmer's Market at the Metro Centre shopping facility - damaged trees at Donovan Golf Course - City of Peoria Office of Emergency Management Coordinator indicated that one house/garage sustained substantial damage in addition to downed trees and minor damage to several homes *Peoria Heights* - broke a pole, snapped a tree that fell on a garage and damaged shingle and siding on N. Wickwood and Prospect roads											
Subtotal:							**0**	**0**	**$260,000**	**$0**	
GRAMD TOTAL:							**30**	**0**	**2,860,000**	**$0**	

* Unless otherwise noted, the GPSD service area is included as part of any location listing for Bellevue, Peoria and Peoria Heights.

[1] The length provided is only for the portion(s) of the tornado that occurred in Peoria County.

^ Tornado touchdown verified in the vicinity of this location(s).

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Peoria County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Peoria Journal Star.
Tri-County MAC Member responses to the Natural Hazard Events Questionnaire.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.5 EXCESSIVE HEAT

HAZARD IDENTIFICATION

What is the definition of excessive heat?

Excessive heat is generally characterized by temperatures that hover 10 degrees or more above the average high temperature of a region for a prolonged period of time (several days to several weeks) and is often accompanied by high humidity. In comparison, a heat wave is generally defined as a period of abnormally and uncomfortably hot and unusually humid weather that typically lasts two or more days.

Excessive heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures.

On hot days the human body relies on the evaporation of perspiration or sweat to cool and regulate the body's internal temperature. Sweating does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.

Excessive heat is one of the leading weather-related killers in the United States. On average, hundreds of fatalities and even more heat-related illnesses occur each year.

What is the Heat Index?

In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **Figure 174** shows the Heat Index as it corresponds to various air temperatures and relative humidity.

As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also, strong winds, particularly with very hot, very dry air, can be extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders.

What are heat disorders?

Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal

Figure 174
Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution   Extreme Caution   Danger   Extreme Danger

Source: NOAA, National Weather Service.

temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches. It can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and painful spasms, usually in the muscles of the legs and possibly the abdomen. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, weakness, nausea, exhaustion, dizziness and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock. If not treated, the victim's condition will worsen.
- **Heat Stroke (Sunstroke).** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be dry and flushed with very little perspiration present. The individual may become mentally confused and aggressive. The pulse is rapid and strong. There is a possibility that the individual will faint or slip into unconsciousness. If the body is not cooled quickly, then brain damage and death may result.

Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

Figure 175 below indicates the heat index at which individuals, particularly those in higher risk groups, might experience heat-related disorders. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate excessive heat alert procedures.

Figure 175
Relationship between Heat Index and Heat Disorders

Heat Index (°F)	Heat Disorders
80°F – 90°F	Fatigue is possible with prolonged exposure and/or physical activity
90°F – 105°F	Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity
105°F – 130°F	Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity
130°F or Higher	Heat stroke highly likely with continued exposure

Source: NOAA, Heat Wave: A Major Summer Killer.

What is an excessive heat alert?

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an excessive heat event. The following provides a brief description of each type of alert based on the ***excessive heat advisory/warning criteria*** established by NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Peoria, Tazewell and Woodford Counties.

- **Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to develop over the next three (3) to seven (7) days.
- **Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 24 to 72 hours.
- **Advisory.** An excessive heat advisory is issued when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.

3.5.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Extreme Heat Fast Facts – Occurrences

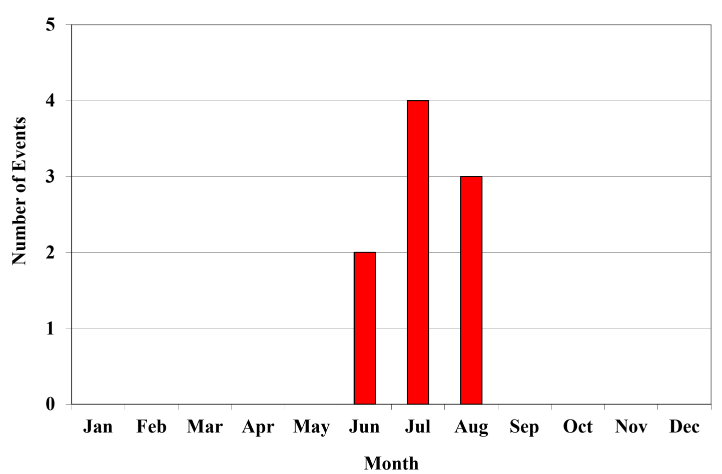
Number of Extreme Heat Events Reported (1997 – 2017): ***9***
Most Likely Month for Extreme Heat Events to Occur: ***July***

Figure 176, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Tazewell County. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Tazewell County between 1997 and 2017.

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 177 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Tazewell County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 177
Graph: Excessive Heat Events by Month
Tazewell County: 1997 – 2017



According to the Midwestern Regional Climate Center station information, temperature records either were not kept or are not available from any of the weather recording stations or networks in Tazewell County, with the exception of the COOP Observation Station east of South Pekin. Temperature data was recorded at this station from December, 2003 through July, 2005. During this period, the hottest temperature recorded at the South Pekin location was 102°F.

What locations are affected by excessive heat?

Excessive heat events affect the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for excessive heat as "elevated."

Do any of the participating municipalities have designated cooling centers?

Yes. Two of the five participating municipalities have designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. **Figure 178a** identifies the location of each cooling center by jurisdiction. At this time Morton, Tremont and Washington do not have any cooling centers designated within their municipalities.

Figure 178a
Designated Cooling Centers by Participating Municipality – Tazewell County

Name/Address	Name/Address
East Peoria	*Pekin*
Festival of Lights Building, 2200 E. Washington St.	City Hall, 111 N. Capitol St.

In addition to those designated cooling centers identified by the participating municipalities, the Illinois Department of Human Services offices located in Pekin also serve as cooling centers.

What is the probability of future excessive heat events occurring?

Tazewell County has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Tazewell County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Tazewell County, including the participating municipalities, is vulnerable to the dangers presented by excessive heat. Since 2008, Tazewell County has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded and no injuries or fatalities were reported as a result of any of the excessive heat events.

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Events

- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability to:

- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

While no recorded injuries or fatalities were reported as a result of excessive heat in Tazewell County, it does not mean that none occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Tazewell County, excessive heat should not impact municipal water supplies since none obtain their water from surface water bodies.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Tazewell County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low. This assessment is based on the absence of designated cooling centers in most of the participating municipalities tempered by the fact that Tazewell County does not have large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 178b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 178b Sensitive Populations by Participating Jurisdiction: Tazewell County			
Participating Jurisdiction	**% of Population 70 year of age & Older**	**% of Population 5 years age & Younger**	**Total % of Sensitive Population**
East Peoria	12.5%	5.9%	18.4%
Morton	14.0%	6.7%	20.7%
Pekin	11.9%	6.4%	18.3%
Tremont	12.0%	5.6%	17.6%
Washington	9.9%	7.9%	17.8%
Unincorp. Tazewell County	16.3%	10.4%	26.7%
Tazewell County	11.3%	6.4%	17.7%

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating municipalities are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Tazewell County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Tazewell County, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered low, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating municipalities are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially sensitive populations such as the elderly, infants, young children and those with medical conditions.

Tazewell County

Figure 176
(Sheet 1 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	n/a	115°F	SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	upper 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	- several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	100°F	mid 70s	115°F	SED	n/a	n/a	n/a	n/a	
7/30/2006 thru 8/2/2006	11:00 a.m.	100°F	mid 70s	110°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 176
(Sheet 2 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
8/11/2010 thru 8/13/2010	2:00 p.m.	90s	n/a	105°F	SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	105°F	70s	110°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	
GRAND TOTAL:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.5.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Figure 179, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Woodford County. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Woodford County between 1997 and 2017.

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1997 – 2017): ***9***

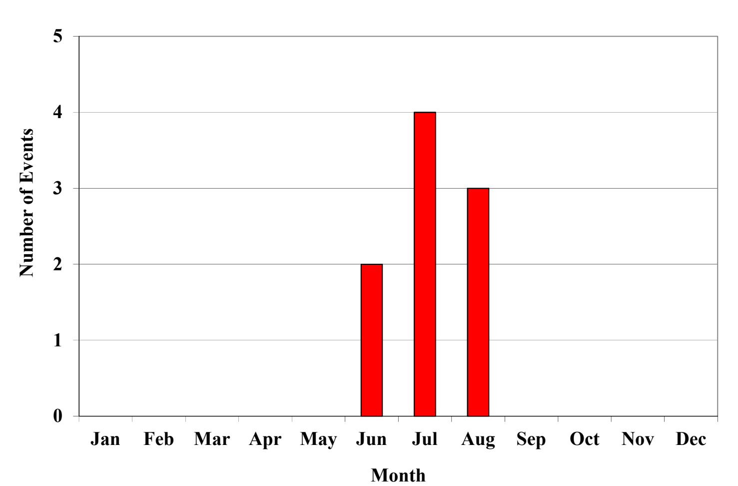
Hottest Temperature Recorded in the County: ***111°F (July 14 & 15, 1936 at Minonk)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 180 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Woodford County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 180
Graph: Excessive Heat Events by Month
Woodford County: 1997 – 2017



According to the Midwestern Regional Climate Center, continuous temperature records for Woodford County have been kept from 1896 to present by the NWS COOP Observer Station at Minonk and from 1996 to present by the COOP Observer Station northwest of Congerville. Based on the available records, the hottest temperature recorded in Woodford County was 111°F at the Minonk COOP Station on July 14, 1936 and again on July 15, 1936. **Figure 181a** lists the hottest days recorded at the Minonk observation station.

Figure 181a
Hottest Days Recorded in Minonk

	Date	Temperature		Date	Temperature
1	07/14/1936	111°F	4	07/12/1936	110°F
2	07/15/1936	111°F	5	07/07/1936	108°F
3	07/11/1936	110°F	6	07/28/1916	107°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat events affect the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for excessive heat as "elevated."

Do any of the participating municipalities have designated cooling centers?

Yes. One of the three participating municipalities has designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. Eureka designates centers as needed and indicated their locations vary due to event needs. There are no State of Illinois-designated cooling centers in Woodford County.

What is the probability of future excessive heat events occurring?

Woodford County has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Woodford County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Woodford County, including the participating municipalities, is vulnerable to the dangers presented by excessive heat. Since 2008, Woodford County has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded and no injuries or fatalities were reported as a result of any of the excessive heat events.

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Events
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability to:
- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

While no recorded injuries or fatalities were reported as a result of excessive heat in Woodford County, it does not mean that none occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Woodford County, excessive heat should not impact municipal water supplies since none obtain their water from surface water bodies.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Woodford County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low. This assessment is based on the absence of designated cooling centers in the participating municipalities tempered by the fact that Woodford County does not have large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 181b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 181b
Sensitive Populations by Participating Jurisdiction: Woodford County

Participating Jurisdiction	% of Population 70 year of age & Older	% of Population 5 years age & Younger	Total % of Sensitive Population
Eureka	14.7%	7.2%	21.9%
Germantown Hills	3.9%	7.9%	11.8%
Roanoke	15.3%	6.3%	21.6%
Unincorp. Woodford County	10.3%	6.3%	16.6%
Woodford County	10.6%	6.5%	17.1%

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating municipalities are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Woodford County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Woodford County, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered low, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating municipalities are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially sensitive populations such as the elderly, infants, young children and those with medical conditions.

Woodford County

Figure 179
(Sheet 1 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	69°F	115°F	COOP/ SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	96°F	67°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	- several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	98°F	65°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	101°F	70°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	101°F	66°F	115°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/30/2006 thru 8/2/2006	11:00 a.m.	98°F	73°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 179
(Sheet 2 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
8/11/2010 thru 8/13/2010	2:00 p.m.	94°F	69°F	105°F	COOP/ SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	93°F	73°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	106°F	67°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	
GRAND TOTAL:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.5.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING JURISDICTIONS)

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1997 – 2017): ***9***

Hottest Temperature Recorded in the County: ***113°F (July 15, 1936 at the Peoria International Airport)***

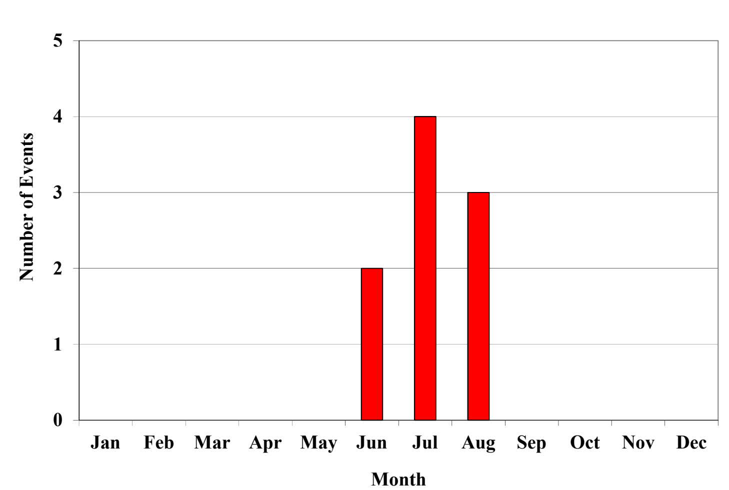
Most Likely Month for Excessive Heat Events to Occur: ***July***

Figure 182, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in the Peoria County, including the participating jurisdictions. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Peoria County between 1997 and 2017.

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 183 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Peoria County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 183
Graph: Excessive Heat Events by Month Participating Peoria County Jurisdictions: 1997 – 2017



According to the Midwestern Regional Climate Center, continuous temperature records have been kept from 1914 to present by the NWS COOP Observer Station at the Peoria International Airport. Based on the available records, the hottest temperature recorded at the Airport was 113°F on July 15, 1936. **Figure 184a** lists the hottest days recorded at the Airport observation station.

Figure 184a
Hottest Days Recorded at the Peoria International Airport

	Date	Temperature			Date	Temperature
1	07/15/1936	113°F		4	07/11/1936	108°F
2	07/14/1936	110°F		5	07/12/1936	107°F
3	07/13/1936	109°F		6	07/27/1930	107°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat events affect the entire County, including the participating jurisdictions. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for excessive heat as "elevated."

Do any of the participating jurisdictions have designated cooling centers?

Yes. One of the six participating jurisdictions has designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during excessive heat events. Peoria has designated the Police Station Lobby at 600 SW Adams Street as a designated cooling center along with fire stations at various locations as available. At this time Bartonville, Chillicothe, Hanna City, Peoria Heights and the GPSD do not have any cooling centers designated within their jurisdictions.

In addition to those designated cooling centers identified by the participating jurisdictions, the Illinois Department of Human Services office located in Peoria also serves as cooling center.

What is the probability of future excessive heat events occurring?

Peoria County (including the participating jurisdictions) has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Peoria County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of the participating jurisdictions are vulnerable to the dangers presented by excessive heat. Since 2008, Peoria County (including the participating jurisdictions) has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded. NOAA's Storm Events Database did document two fatalities as a result of two excessive heat events in the participating jurisdictions. The following provides a brief description of each event.

- On June 27, 1998 a woman died at her home in Peoria as a result of heat-related causes.
- An individual died as a result of the intense heat on July 5, 2012 in Chillicothe.

<u>Excessive Heat Fast Facts – Impacts/Risk</u>

<u>Excessive Heat Events</u>
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***2***
- Injuries: ***n/a***

<u>Excessive Heat Risk/Vulnerability to:</u>
- Public Health & Safety – General Population: ***Low to Medium***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

While only two fatalities were reported as a result of excessive heat events in the participating jurisdictions, it does not mean that additional injuries and fatalities did not occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in jurisdictions imposing water use restrictions. Excessive heat has the ability to potentially impact the drinking water supplies of Peoria (including the GPSD), Bartonville and Hanna City which obtain a portion of their water from the Illinois River. This vulnerability to excessive heat is partially limited due to the surface water/groundwater combination supplied by Illinois American Water Company.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in participating jurisdictions, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low to medium. This assessment is based on the absence of designated cooling centers in most of the participating jurisdictions, the previously reported fatalities and in the case of Peoria, the presence of low-income neighborhoods with poorly-ventilated buildings. These factors are partially offset by the general awareness of the dangers associated with excessive heat and the steps that should be taken to combat heat-related disorders.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 184b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 184b
Sensitive Populations by Participating Jurisdiction: Participating Peoria County Jurisdictions

Participating Jurisdiction	% of Population 70 year of age & Older	% of Population 5 years age & Younger	Total % of Sensitive Population
Bartonville[1]	12.0%	5.3%	17.3%
Chillicothe	12.3%	6.2%	18.5%
Hanna City	14.2%	5.6%	19.8%
Peoria[2]	9.5%	7.5%	17.0%
Peoria Heights[2]	10.5%	5.4%	15.9%

[1] Partially located within the GPSD service area
[2] Located within the GPSD service area
Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the participating jurisdictions are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the jurisdictions.

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in participating jurisdictions, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered ***low***, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the participating jurisdictions are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive.

Participating Peoria County Jurisdictions

Figure 182
(Sheet 1 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	n/a	115°F	SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	upper 90s	n/a	110°F	SED	n/a	1	n/a	n/a	- a woman died in her Peoria home on the 27th from heat-related causes - several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	mid 90s	n/a	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	100°F	mid 70s	115°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**1**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Participating Peoria County Jurisdictions

Figure 182
(Sheet 2 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/30/2006 thru 8/2/2006	11:00 a.m.	100°F	mid 70s	110°F	SED	n/a	n/a	n/a	n/a	
8/11/2010 thru 8/13/2010	2:00 p.m.	90s	n/a	105°F	SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	105°F	70s	110°F	SED	n/a	1	n/a	n/a	an individual died as a result of the intense heat in Chillicothe on the 5th
Subtotal:						**0**	**1**	**$0**	**$0**	
GRAND TOTAL:						**0**	**2**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.6 DROUGHTS

HAZARD IDENTIFICATION

What is the definition of a drought?

While difficult to define, the National Drought Mitigation Center (NDMC) considers "drought" in its most general sense to be a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage for some activity, group or environmental sector.

Drought is a normal and recurrent feature of climate and can occur in all climate zones, though its characteristics and impacts vary significantly from one region to another. Unlike other natural hazards, drought does not have a clearly defined beginning or end. Droughts can be short, lasting just a few months, or they can persist for several years. There have been 25 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the United States between 1980 and 2017. This is due in part to the sheer size of the areas affected.

What types of drought occur?

There are four main types of drought that occur: meteorological, agricultural, hydrological and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

How are droughts measured?

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the United States was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective measuring drought impacts on agriculture. For many years it was the only operational drought index and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009 the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the United States was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the County. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

U.S. Drought Monitor (USDM)

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States. It is unique in that it combines a variety of data-based drought indices and indicators with local expert input to create a single composite drought indicator, the results of which are illustrated via a weekly map that depicts drought conditions across the United States. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

Five drought intensity categories, D0 through D4, are utilized to identify areas of drought. **Figure 185** provides a brief description of each category. As mentioned previously, the drought intensity categories are based on five key indicators, numerous supplementary indicators and local observers. The five key indicators include: the Palmer Drought Severity Index, the Climate Prediction Center's Soil Moisture Model (percentiles), the United States Geological Survey Weekly Streamflow (percentiles), the Standardized Precipitation Index and the Objective Drought Indicator Blends (percentiles).

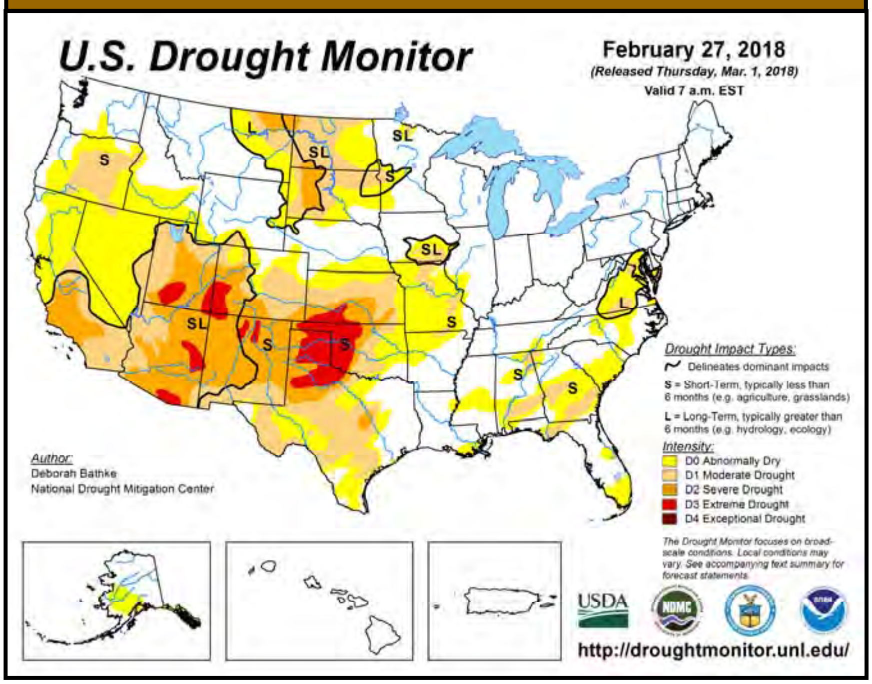
Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what a majority of the indictors show and on local observations. The authors also weight the indices according to how well they perform in various parts of the country and at different times of the year. It is the combination of the best available data, location observations and experts' best judgment that make the U.S. Drought Monitor more versatile than other drought indices.

Figure 185 U.S. Drought Monitor – Drought Severity Classifications	
Category	**Possible Impacts**
D0 (Abnormally Dry)	• Going into drought: - short-term dryness slowing planting, growth of crops or pastures. • Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered
D1 (Moderate Drought)	• Some damage to crops, pastures • Streams, reservoirs, or wells low; some water shortages developing or imminent • Voluntary water-use restrictions requested
D2 (Severe Drought)	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3 (Extreme Drought)	• Major crop/pasture losses • Widespread water shortages or restrictions
D4 (Exceptional Drought)	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor.

In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure 186** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture look at drought conditions in the United States. It is not designed to infer specifics about local conditions.

Figure 186
U. S. Drought Monitor



Map Courtesy of NDMC-UNL.

3.6.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

Drought Fast Facts – Occurrences

Number of Drought Events Reported (1983 – 2017): ***6***

According to NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA) and the USDA there have been six drought events reported for Tazewell County between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 18.2% to 38.4% lower than the previous year.
- In 1988, approximately half of all Illinois counties (including Tazewell County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 35.7% to 50.7% lower than the previous year, according to USDA crop yield statistics.
- In 2005, drought conditions impacted much of the State, including Tazewell County. A dry winter and spring developed into drought conditions by the beginning of June. On May 24, 2005 Tazewell County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for the County were downgraded to D2 – severe drought on September 20, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.

  On July 27, 2005 the USDA designated 93 counties in Illinois, including Tazewell County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, corn yields were 24.1% lower than the previous year.
- In 2011, drought conditions impacted portions of the state. On August 9, 2011 the southern half of Tazewell County was designated as D1 – moderate drought and upgraded to D2 – severe drought on August 30, 2011. Drought conditions for the County were downgraded to D1 – moderate drought on September 27, 2011. All designations were removed on November 15, 2011.

  On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Tazewell

County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.

- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 5, 2012 the southern half of Tazewell County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on June 19, 2012 due to an abnormally warm and dry spring. Five weeks later on July 24, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. Only 1.00 to 1.25 inches of rain fell across Tazewell County during the month making it the 9th driest July on record. As a result of the hot and dry conditions, a countywide burn ban was instituted. The flow along the Mackinaw River near Green Valley dropped into the 11th percentile and the flow along Fondulac Creek near East Peoria ties for the lowest on record.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought and again to D0 – abnormally dry on November 13, 2012. All designations were removed on February 5, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Tazewell County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat. According to USDA crop yield statistics, soybean and corn yields were 10.1% to 22.8% lower than the previous year.

- In 2013, a “flash drought” impacted central Illinois. While droughts typically develop slowly, a “flash drought” happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On August 27, 2013 the western half of Tazewell County was designated as D1 – moderate drought with the entire County upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. A majority of the County was downgraded to D1 – moderate drought on November 5, 2013. A week later a majority of the County was downgraded to D0 – abnormally dry. It wasn’t until April 8, 2014 that all drought designations were removed.

  Given the timing of this “flash drought”, no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Tazewell County did not show any reductions from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Tazewell County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Tazewell County has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Tazewell County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Tazewell County is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Tazewell County has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the six drought events experienced between 1983 and 2017. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $35.9 million in damages to the corn crop in Tazewell County. Damage information was either unavailable or none was recorded for the remaining five reported occurrences.

Of the six drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilites Damage*: ***n/a***
- Total Crop Damage: ***$35.9 million (corn crop damage only – 2012 drought)***

Drought Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

No injuries or fatalities were reported as a result of any of the recorded drought events in Tazewell County.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

<u>*Crop Yield Reductions*</u>

Agriculture is an important industry in Tazewell County. Farmland accounts for 81.2% of all the land in the County. According to the 2012 Census of Agriculture, there were 942 farms in Tazewell County occupying 337,376 acres. Of the land in farms, approximately 90.1% or 304,039 acres is in crop production. Due to its sandy soils and a plentiful supply of water from the Mahomet Aquifer, the farms within the County have developed extensive irrigation systems to help them grow specialty crops such as pumpkins, which Tazewell County produces more of than any county in Illinois. As a result, approximately 12.6% or 38,492 acres of the land in crop production is irrigated. Compared to a majority of the State and even neighboring counties, this is a large number of irrigated acres.

According to the 2012 Census of Agriculture, crop sales accounted for $233.8 million in revenue while livestock sales accounted for $29.9 million. Tazewell County ranks 18th in Illinois for crop cash receipts and 34th for livestock cash receipts. A severe drought would have a great financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005 and 2012 droughts. **Figure 187** illustrates the reduction yields seen for corn and soybeans during the six recorded drought events.

Figure 187
Crop Yield Reductions Due to Drought – Tazewell County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	138.0	--	44.0	--
1983	**85.0**	**38.4%**	**36.0**	**18.2%**
1984	118.0	--	36.5	--
1987	138.0	--	42.5	--
1988	**68.0**	**50.7%**	**27.0**	**35.7%**
1989	125.0	--	48.5	--
2004	187.0	--	54.0	--
2005	**142.0**	**24.1%**	**53.0**	**1.9%**
2006	176.0	--	54.0	--
2010	163.4	--	58.1	--
2011	172.7	--	57.3	1.4%
2012	**133.4**	**22.8%**	**51.5**	**10.1%**
2013	177.1	--	54.6	--
2014	224.4	--	61.0	--

Source: USDA, National Agricultural Statistics Service.

Records obtained from the USDA's National Agricultural Statistics Service show that the 1983 drought resulted in corn yield reductions of 38.4% and soybean yield reductions of 18.2% while the 1988 drought resulted in corn yield reductions of 50.7% and soybean yield reductions of

35.7%. In 2005, the drought caused a 24.1% reduction in corn yields and a 1.9% reduction in soybean yields while the 2012 drought led to corn yield reductions of 22.8% and soybean yield reductions of 10.1%.

Drinking Water Shortages
Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Tazewell County ***none of the participating municipalities rely on surface water sources*** for their drinking water supplies. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, all of the participating municipalities obtain their water from deep sand and gravel aquifers, with the exception of several wells in Pekin and East Peoria. Six of East Peoria's eleven wells and three of Illinois American Water Company – Pekin District's eight wells are drilled into shallow unconfined aquifers. The use of deep wells helps lessen a municipality's vulnerability to drought.

While the participating jurisdictions are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is low.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer's water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is low, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large portion of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.6.2 Woodford County

Hazard Profile

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

> **<u>Drought Fast Facts – Occurrences</u>**
>
> Number of Drought Events Reported (1983 – 2017): ***6***

According to NOAA's Storm Events Database, the Illinois State Water Survey, IEMA and the USDA there have been six drought events reported for Woodford County between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 10.3% to 39.4% lower than the previous year.

- In 1988, approximately half of all Illinois counties (including Woodford County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 44.9% to 58.9% lower than the previous year, according to USDA crop yield statistics.

- In 2005, drought conditions impacted much of the State, including Woodford County. A dry winter and spring developed into drought conditions by the beginning of June. On May 24, 2005 a majority of Woodford County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for the County were downgraded to D2 – severe drought on September 27, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.

  On July 27, 2005 the USDA designated 93 counties in Illinois, including Woodford County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, soybean and corn yields were 5.6% to 20.9% lower than the previous year.

- In 2011, drought conditions impacted portions of the state. On August 2, 2011 Woodford County was designated at D0 – abnormally dry. All designations were removed on October 4, 2011. On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Woodford County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.

- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 12, 2012 Woodford County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 19, 2012 due to an abnormally warm and dry spring. Five weeks later on July 24, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. On Average only 0.40 inches of rain fell across Woodford County during July which was among the top three driest Julys on record. In August the Mackinaw River at Congerville dropped to the 9th lowest on record.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought / D1 – moderate drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought / D0 – abnormally dry and again to D0 – abnormally dry on November 13, 2012. All designations were removed on February 5, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Woodford County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat.

According to USDA crop yield statistics, soybean and corn yields were 23.1% to 45.0% lower than the previous year.

- In 2013, a "flash drought" impacted central Illinois. While droughts typically develop slowly, a "flash drought" happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On September 3, 2013 Woodford County was designated as D1 – moderate drought and upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. The County was downgraded to D1 – moderate drought on November 5, 2013 and again on November 12, 2013 to D0 – abnormally dry. Abnormally dry conditions lingered across the southern portion of the county through the winter. It wasn't until February 25, 2014 that all drought designations were removed.

  Given the timing of this "flash drought", no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Woodford County did not show any reductions from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Woodford County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Woodford County has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Woodford County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Woodford County is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Woodford County has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the six drought events experienced between 1983 and 2017. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $29.2 million in damages to the corn crop in Woodford County. Damage information was either unavailable or none was recorded for the remaining five reported occurrences.

Of the six drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- ❖ Total Property Damage: ***n/a***
- ❖ Infrastructure/Critical Facilites Damage*: ***n/a***
- ❖ Total Crop Damage: ***$29.2 million (corn crop damage only – 2012 drought)***

Drought Risk/Vulnerability to:
- ❖ Public Health & Safety: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

No injuries or fatalities were reported as a result of any of the recorded drought events in Woodford County.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

Crop Yield Reductions

Agriculture is an important enterprise in Woodford County. Farmland accounts for 95.6% of all the land in the County. According to the 2012 Census of Agriculture, there were 958 farms in Woodford County occupying 322,983 acres. Of the land in farms, approximately 90.3% or 291,630 acres is in crop production. Less than 1% of the land in crop production is irrigated.

According to the 2012 Census of Agriculture, crop sales accounted for $188.8 million in revenue while livestock sales accounted for $51.8 million. Woodford County ranks 22nd in Illinois for crop cash receipts and 18th for livestock cash receipts. A severe drought would have a great financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005 and 2012 droughts. **Figure 188** illustrates the reduction yields seen for corn and soybeans during the four recorded drought events.

Records obtained from the USDA's National Agricultural Statistics Service show that the 1983 drought resulted in corn yield reductions of 39.4% and soybean yield reductions of 10.3% while the 1988 drought resulted in corn yield reductions of 58.9% and soybean yield reductions of 44.9%. In 2005, the drought caused a 20.9% reduction in corn yields and a 5.6% reduction in soybean yields while the 2012 drought led to corn yield reductions of 45.0% and soybean yield reductions of 23.1%.

Figure 188
Crop Yield Reductions Due to Drought – Woodford County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	142.0	--	43.5	--
1983	**86.0**	**39.4%**	**39.0**	**10.3%**
1984	110.0	--	37.0	5.1%
1987	129.0	--	44.5	--
1988	**53.0**	**58.9%**	**24.5**	**44.9%**
1989	118.0	--	48.0	--
2004	182.0	--	54.0	--
2005	**144.0**	**20.9%**	**51.0**	**5.6%**
2006	177.0	--	55.0	--
2010	171.5	--	56.1	--
2011	186.5	--	60.5	--
2012	**102.5**	**45.0%**	**46.5**	**23.1%**
2013	192.3	--	56.9	--
2014	217.5	--	61.4	--

Source: USDA, National Agricultural Statistics Service.

Drinking Water Shortages
Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Woodford County ***none of the participating municipalities rely on surface water sources*** for their drinking water supplies. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, all of the participating municipalities obtain their water from deep sand and gravel aquifers, with the exception of two of Roanoke's four wells. These two wells are drilled into shallow unconfined aquifers. The high recharge rate found in these unconfined aquifers and the presence of two deep wells have generally helped prevent water shortages during drought.

While the participating jurisdictions are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is low.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer's water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is low, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large portion of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.6.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING JURISDICTIONS)

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

Drought Fast Facts – Occurrences

Number of Drought Events Reported (1983 – 2017): ***6***

According to NOAA's Storm Events Database, the Illinois State Water Survey, IEMA and the USDA there have been six drought events reported for Peoria County (including the participating jurisdictions) between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 16.9% to 48.5% lower than the previous year.
- In 1988, approximately half of all Illinois counties (including Peoria County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 23.8% to 48.3% lower than the previous year, according to USDA crop yield statistics.
- In 2005, drought conditions impacted much of the State, including Peoria County. A dry winter and spring developed into drought conditions by the beginning of June. On June 7, 2005 Peoria County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for most of the County were downgraded to D2 – severe drought on September 20, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.
- On July 27, 2005 the USDA designated 93 counties in Illinois, including Peoria County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, soybean and corn yields were 18.2% to 38.0% lower than the previous year.
- In 2011, drought conditions impacted portions of the state. On August 30, 2011 the southern half of Peoria County was designated at D1 – moderate drought. Drought conditions for the entire County were downgraded to D0 – abnormally dry on September 27, 2011. All designations were removed on November 15, 2011.

  On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Peoria County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.

- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 12, 2012 the southern half of Peoria County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on July 17, 2012 due to an abnormally warm and dry spring. Three weeks later on August 7, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. Dredging was necessary on the Illinois River south of the Peoria Lock & Dam to keep the channel clear for barge traffic due to low river levels.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought. Moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry on February 5, 2013. All designations were removed on March 12, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Peoria County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat. According to USDA crop yield statistics, corn and soybean yields were 4.1% to 6.7% lower than the previous year.

- In 2013, a "flash drought" impacted central Illinois. While droughts typically develop slowly, a "flash drought" happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On August 27, 2013 Peoria County was designated as D1 – moderate drought and upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. The County was downgraded to D1 – moderate drought on November 5, 2013. A week later a majority of the County has all designations removed. Abnormally dry conditions persisted along the western and southern edges through the winter. It wasn't until February 25, 2014 that all drought designations were removed.

  Given the timing of this "flash drought", no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Peoria County did show a 5.7% reduction in soybean yields from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Peoria County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County, including the participating jurisdictions. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Peoria County (including the participating jurisdictions) has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Peoria County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of the participating jurisdictions are vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Peoria County (including the participating jurisdictions) has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was either unavailable or none was recorded for any of the six drought events experienced between 1983 and 2017 within the participating jurisdictions.

No injuries or fatalities were reported as a result of any of the recorded drought events in the participating Peoria County jurisdictions.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilites Damage*: ***n/a***

Drought Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

Jurisdictions that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, ***three of the participating municipalities rely, in part, on surface water sources*** for their drinking water supplies. Bartonville, Hanna City and Peoria (including the GPSD) all purchase drinking water from the Illinois American Water Company (IAWC). IAWC draws water from the Illinois River through one surface water intake and utilizes 14 shallow sand and gravel located in three separate well fields to supply drinking water to its customers. Approximately 60 percent of the water is groundwater and 40 percent is surface water.

While these participants receive a portion of their drinking water from a surface water source, their vulnerability to drought is partially limited due to the surface water/groundwater combination. However, they are still more vulnerable than communities that rely solely on deep wells to shortages as a result of a prolonged drought or a series of droughts in close succession. The remaining two participating municipalities, Chillicothe and Peoria Heights, obtain their water from relatively shallow sand and gravel aquifers.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the participants, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is ***low***.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in the participating jurisdictions are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer’s water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is ***low***, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the participating jurisdictions are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.7 LANDSLIDES

HAZARD IDENTIFICATION

What is the definition of a slope?

A slope generally refers to any natural or artificial incline of the earth's surface.

What is the definition of a landslide?

A landslide or slope failure is the mass downward and outward movement of slope-forming materials such as rock, soil, artificial fill, organic matter, debris or a combination of these that occurs under the force of gravity. Depending on the type of landslide, it can move rapidly damaging roads and homes or develop slowly causing gradual damage that may occur over months and even years.

How are landslides classified?

Landslides are classified by: 1) the type of slope movement and 2) the slope material involved and include rock falls, rock slides, debris flows, mudflows, debris avalanches, earth flows and debris slides.

Slope Movement

Slope movements include falls, topples, slides, spreads and flows. The following provides a brief description of each.

- ❖ ***Falls*** occur when masses of rock or other material become detached from steep slopes or cliffs and descend by free-falling, bouncing or rolling.
- ❖ ***Topples*** consist of forward rotation of rocks or other material about a pivot point on a slope. Toppling can be driven by gravity or by fluids (water or ice) in cracks.
- ❖ ***Slides*** involve the downslope movement of rock or other material along one or more distinct zones of weakness that separate the slide material from more stable underlying material. The two major types of slides are rotational and transitional.
- ❖ ***Spreads*** usually occur on very gentle slopes or essentially flat terrain where a stronger upper layer of rock or soil moves above an underlying softer, weaker layer. In some cases, the stronger upper layer will subside into the weaker underlying layer. The failure is caused by liquefaction and usually triggered by rapid ground motion, such as that experienced during an earthquake.
- ❖ ***Flows*** are distinguished from slides by high water content and have a velocity resembles that of a viscous liquid. There are five basic categories of flows: debris flow, debris avalanche, earthflow, mudflow and creep.

A combination of two or more of the main types of slope movement is referred to as a "complex movement."

<u>*Slope Material*</u>
The slope material in a landslide is either rock, soil or both. Soil is further classified as "debris" if it is composed of predominantly course fragments or "earth" if it is composed of sand-sized or finer particles.

What causes a landslide?

Landslides can have multiple causes, both natural and man-made. In terms of natural factors, topography, geology and precipitation play an important role in the formation of landslides. Frequently landslides occur when soil is saturated from heavy rain or snowmelt. Landslides can also be initiated in slopes already on the verge of movement by changes in water levels, stream erosion, bedrock fracturing, freeze-thaw cycles, tree root growth, changes in ground water, earthquakes and volcanic activity.

Man-made factors that can contribute to landslides include mining operations, excavation of a slope or its toe for building purposes, loading of a slope or its crest related to construction activities, deforestation, artificial vibrations, irrigation and water leakage from utilities. Individuals seeking unique views of rivers, valleys and lakes can also contribute to landslides by building on land that might have been better left to agriculture, open-space or other uses than for dwellings. The construction of homes on slopes that overwhelm the underlying support material have resulted in landslides. This activity is also referred to as overloading the top of the slope. This type of problem involving residential construction has occurred in Lake County along Lake Michigan and in LaSalle County along the Illinois River.

Where do landslides occur?

Landslides typically start on steep hillsides (slopes) and are primarily associated with mountainous regions, although they can also occur in areas of generally low relief. In low-relief areas, landslides occur in cut-and-fill area associated with roadways and building excavations, along river bluffs, and at quarries and open-pit mines.

Landslides occur in all 50 states, including Illinois. In Illinois, landslides primarily occur in areas adjacent to major rivers and lakes where there are bluffs, hills and valleys. Areas most vulnerable to landslides include the upper Mississippi River, the lower Mississippi River, the middle portion of the Illinois River (roughly covering the area from LaSalle County to Mason County), and the bluff areas along Lake Michigan.

3.7.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in Tazewell County. These areas are primarily associated with the Illinois and Mackinaw Rivers and their tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

Landslide Fast Facts – Occurrences
Number of Landslide Events Reported: ***4***
Probability of Future Landslide Events: ***Low to Medium***

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's 1985 *Landslide Inventory of Illinois*, local newspaper articles and discussions with MAC members documented four landslide events in Tazewell County between 1995 and 2017. All of the events occurred during the spring. The following provides a brief description of each event.

❖ On May 11, 1995 a mudslide crashed into The Meadows apartment complex in East Peoria. The complex is located at the foot of a steep cliff that was topped by a construction site. Residents reported hearing a loud boom about 5:30 a.m. and waking to find their apartments torn apart. Three apartments were heavily damaged with one engulfed in mud. The mudslide also cut the power and gas lines to the building.

❖ On April 18, 2013 a landslide caused by heavy rain resulted in the immediate evacuation of four houses in the Pinecrest Hills subdivision of East Peoria. An additional three houses were later evacuated and all of the houses were deemed too dangerous to be inhabited. The backyards of some of the houses slid to the bottom of a steep ravine behind the properties, leaving the structures teetering on the edge of a steep and potentially compromised hillside. The houses were demolished in 2017 and the area graded and fenced.

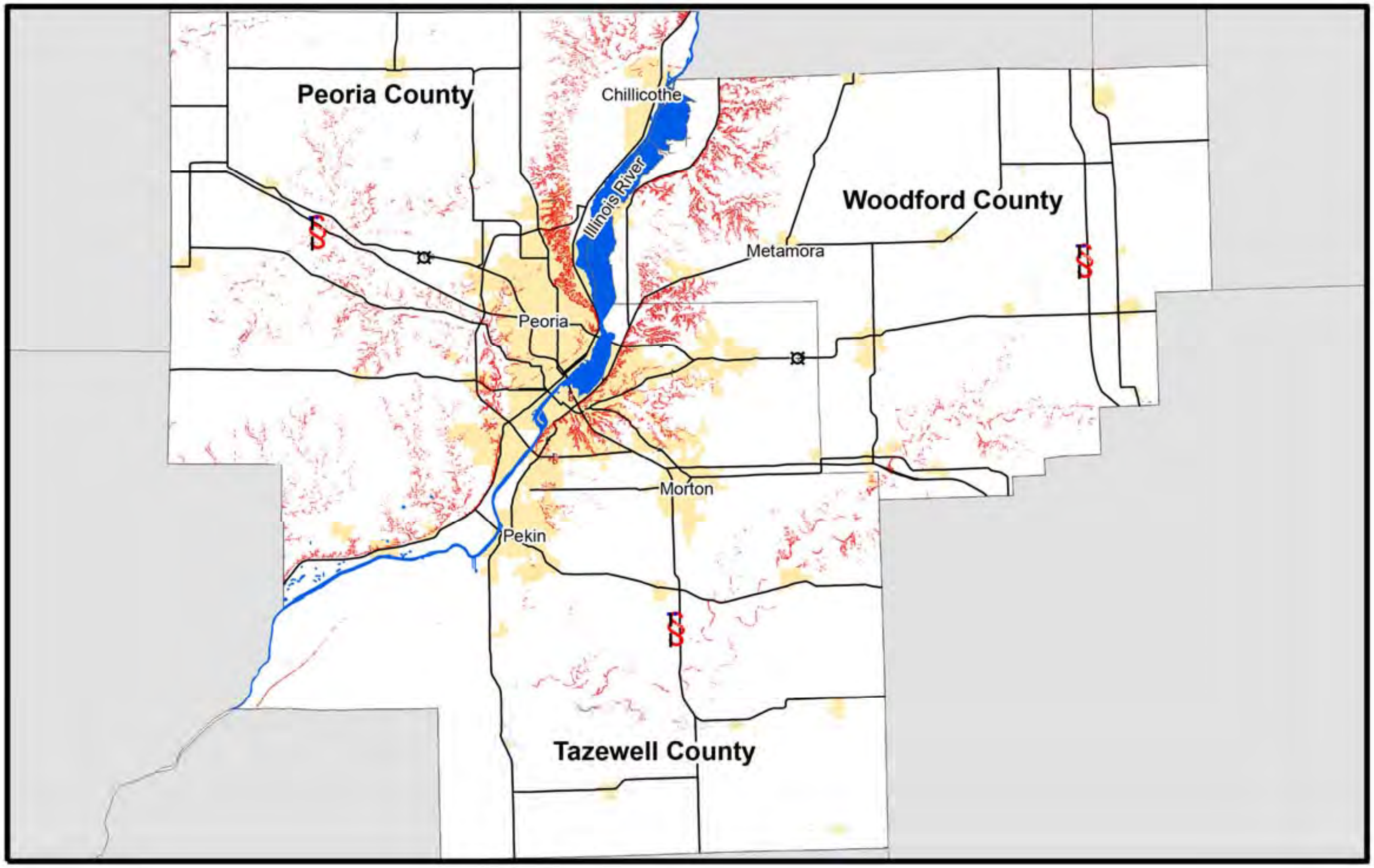
  During the same heavy rain event a mudslide was reported along the western bluffs of the Illinois River in East Peoria, damaging a gas station and covering US Route 150 with several inches of mud.

❖ Sometime during the spring of 2018, a landslide occurred in an inaccessible ravine in East Peoria damaging a sewer trunk line and causing a sewage leak. The damage was not discovered until mid-summer.

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In Tazewell County, the bluffs of the Illinois River floodplain located along the western edge of the County from Pekin northward to the Tazewell/Woodford County line and areas surrounding the Mackinaw River floodplain in the central and eastern parts of the County are the most likely locations affected by landslides.

Figure 189
Steep Slopes in the Tri-County Area



Tri-County Steep Slopes

Based on 25% slopes (25-foot min. height)

Parcel data as of 1999
Photo as of 2004
Ravine Overlay District used

Legend
Steep Slopes 25%
Roads
Illinois River
Municipal Boundaries
0 2 4 6 8 Miles

What is the probability of future landslide events occurring?

Tazewell County has experienced four verified landslides between 1995 and 2017. With four occurrences over the past 23 years, the probability or likelihood that Tazewell County may experience a landslide event in any given year is 17%. There are almost certainly gaps in the landslide data that distort this probability. It is likely given the topography of the area that additional landslides have occurred in areas that are either inaccessible or have had little impact. As a result, it is estimated that the probability of future landslide events occurring is ***low to medium***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of East Peoria, Morton, Pekin, Washington and unincorporated Tazewell County are vulnerable to the dangers presented by landslides. None of the rest of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded landslide events?

Damage information was only available for one of the four events experienced between 1995 and 2017. According to the East Peoria Director of Public Works, the repairs to the sewer truck line damaged in the 2018 landslide cost an estimated $14,422. Damage information was either unavailable or for the remaining three events.

While damage information was unavailable for the 2013 landslide events, news articles reported that the seven houses demolished as a result of the landslide in the Pinecrest Hills subdivision ranged in value from $160,000 to $212,000.

Newspaper articles documented one fatality as a result of the 1995 mudslide. A 34-year old woman was buried under four feet of mud and debris in her apartment. No other injuries or fatalities were reported.

Landslides Fast Facts – Impacts/Risk

Landslides Events
- Total Property Damage: ***$14,422***
- Infrastructure/Critical Facilities Damage*: ***$14,422***
- Fatalities: ***1***
- Injuries: ***n/a***

Landslide Risk/Vulnerability to:
- Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For Tazewell County the risk or vulnerability posed by landslides to public health and safety is considered to be low to medium for steep slope areas as described previously and low for all other areas of the County. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, only East Peoria has a steep slope ordinance in place that will likely lessen the vulnerability of those buildings and critical facilities built since it was enacted in 2006. None of the other participating jurisdictions have specific regulations for building practices within steep slope areas. This means existing buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in Tazewell County is considered to be low to medium for steep slope areas and low for all other areas in the County.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes and No. While East Peoria has a steep slope ordinance in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides, the County and the other three municipalities vulnerable to landslides do not. As a result, any future buildings and critical facilities built on steep slope areas in these jurisdictions are vulnerable to landslides.

Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will continue to be vulnerable as long as specific building regulations are not enacted. Future buildings, infrastructure and critical facilities in these areas will face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.7.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in Woodford County. These areas are primarily associated with the Illinois and Mackinaw Rivers and their tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's (ISGS's) 1985 *Landslide Inventory of Illinois*, local newspaper articles and discussions with MAC members documented one landslide event in Woodford County. A natural earth slump occurred north of Congerville prior to 1985. Information on the date this event occurred was unavailable.

Landslide Fast Facts – Occurrences

Number of Landslide Events Reported: ***1***

Probability of Future Landslide Events: ***Low***

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In Woodford County, the bluffs of the Illinois River floodplain located along the western edge of the County from the Woodford/Tazewell County line to the Woodford/Marshall County line and areas surrounding the Mackinaw River floodplain in the southern part of the County are the most likely locations affected by landslides.

What is the probability of future landslide events occurring?

Given the limited amount of data available, it is difficult to specifically establish the probability of a future landslide. However, if factors such as the extent of the development and infrastructure in the vicinity of steep slope areas, soil stability and weather events are taken into consideration, then the probability is estimated to be ***Low***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of unincorporated Woodford County are vulnerable to the dangers presented by landslides. None of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded landslide events?

Damage information was either unavailable or none was recorded for the single recorded event. No injuries or fatalities were reported as a result this event either.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

Landslides Fast Facts – Impacts/Risk

Landslides Events

- ❖ Total Property Damage: ***n/a***
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Fatalities: ***n/a***
- ❖ Injuries: ***n/a***

Landslide Risk/Vulnerability to:

- ❖ Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For Woodford County the risk or vulnerability posed by landslides to public health and safety is considered to be low to medium for steep slope areas as described previously and low for all other areas of the County. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, there are no specific regulations for building practices within steep slope areas in Woodford County. This means existing buildings as well as buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in Woodford County is considered to be low to medium for steep slope areas and low for all other areas in the County.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. None of the participating jurisdictions have steep slope ordinances in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides. Any future buildings and critical facilities built within steep slope areas will have the same vulnerability to landslides as those of existing buildings and critical facilities described previously. Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will also continue to be vulnerable as long as specific building regulations are not enacted.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.7.3 PARTICIPATING PEORIA COUNTY JURISDICTIONS

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in the participating Peoria County jurisdictions. These areas are primarily associated with the Illinois River and its tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's (ISGS's) 1985 *Landslide Inventory of Illinois*, local newspaper articles, the 2010 Plan and discussions with MAC members documented seven landslide events in the participating Peoria County jurisdictions. The following provides a brief description of each event by jurisdiction.

Peoria

- According to the ISGS ISGS's 1985 *Landslide Inventory of Illinois*, there have been two landslide events in the City. A natural earth slump occurred at the north end of the City while a man-induced rock fall occurred at the southwest end. Information on the date these events occurred was unavailable.
- On April 29, 2017 a heavy rain event caused a mudslide on Illinois Route 29 north of the McCluggage Bridge in Peoria. The mudslide closed the roadway for approximately one mile.

Landslide Fast Facts – Occurrences

Number of Landslide Events Reported: 7

Probability of Future Landslide Events: ***Low to Medium***

Peoria Heights

In 1982 a landslide occurred in Hillside Park across from 4433 Grandview Drive in Peoria Heights according to the Peoria Park District. Information on the specific date this event occurred was unavailable.

Bartonville

According to the ISGS ISGS's 1985 *Landslide Inventory of Illinois*, there have been two landslide events in the Village. A man-induced rock slump and an unclassified man-induced landslide occurred along US Route 24. Information on when these events occurred was unavailable.

GPSD

According to the GPSD Director of Planning and Construction, a landslide occurred along Kickapoo Creek Road which pushed the Kickapoo Interceptor sewer line out of alignment. While the line was displaced, it did not rupture and was moved back into place. Information on the specific date this event occurred was unavailable, but was estimated to be over 20 years ago.

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In the participating Peoria County jurisdictions, the bluffs of the Illinois River floodplain located along the eastern edge of the County are the most likely locations affected by landslides.

Figure 189 illustrates the steep slope areas (slopes of 25% or greater) in the participating Peoria County jurisdictions based on the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005. Bartonville, Chillicothe, Peoria and Peoria Heights as well as portions of the GPSD service area are considered to have steep slope areas. The remaining participating jurisdictions do not have any steep slope areas.

What is the probability of future landslide events occurring?

Given the limited amount of data available, it is difficult to specifically establish the probability of a future landslide. However, if factors such as the extent of the development and infrastructure in the vicinity of steep slope areas, soil stability and weather events are taken into consideration, then the probability is estimated to be ***low to medium*** for the participating jurisdictions that contain steep slope areas. For the purposes of this analysis "medium" is defined as have at least a 50% chance of occurring in any given year while "low" is defined as having less than a 10% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of Bartonville, Chillicothe, Peoria and Peoria Heights as well as the GPSD are vulnerable to the dangers presented by landslides. Hanna City is not considered vulnerable to the dangers presented by landslides.

What impacts resulted from the recorded landslide events?

Damage information was either unavailable or none was recorded for any of the seven events. No injuries or fatalities were reported as a result of any of the events either.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

Landslides Fast Facts – Impacts/Risk

Landslides Events

- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Landslide Risk/Vulnerability to:

- Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For the participating Peoria County jurisdictions, the risk or vulnerability posed by landslides to public health and safety is considered to be ***low*** to ***medium*** for steep slope areas as described previously and low for all other areas. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, there are no specific regulations for building practices within steep slope areas in the participating jurisdictions. This means existing buildings as well as buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

While the GPSD's wastewater treatment facility is not vulnerable to a landslide, its sewer collection system is. Discussions with the GPSD indicate that in steep slope areas, their sewer collection system lines generally run perpendicular to the slope and are anchored with concrete pipe anchor blocks to limit movement in the event of a landslide. However a list of critical facilities/infrastructure vulnerable to landslides within the District's service area is not currently available. As a result, a data deficiency exists for the GPSD in terms of comprehensively identifying the risk to the critical facilities/infrastructure to a landslide.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in the participating jurisdictions is considered to be low to ***medium*** for steep slope areas and ***low*** for all other areas.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. None of the participating jurisdictions have steep slope ordinances in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides. Any future buildings and critical facilities built within steep slope areas will have the same vulnerability to landslides as those of existing buildings and critical facilities described previously. Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will also continue to be vulnerable as long as specific building regulations are not enacted.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.8 EARTHQUAKES

HAZARD IDENTIFICATION

What is the definition of an earthquake?

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

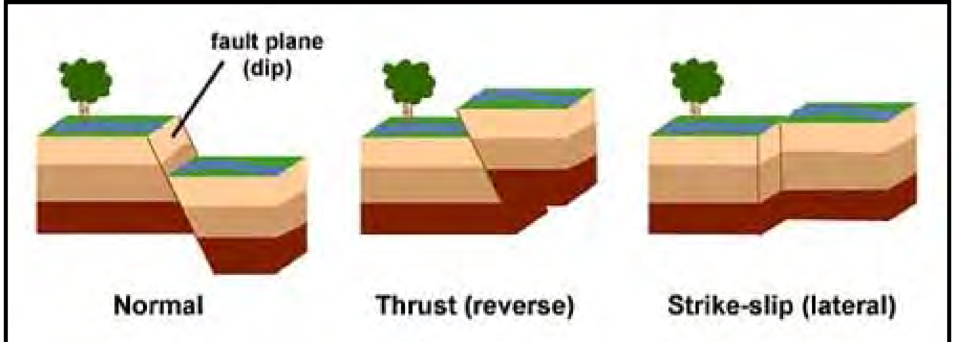
Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous United States are exposed to potentially damaging ground shaking from earthquakes. Over 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10th in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's HAZUS analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central United States (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the Pacific Northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

What is a fault?

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral). **Figure 190** provides an illustration of each type of fault.

Figure 190
Fault Illustration



Source: U. S. Geological Survey.

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Thrust or reverse faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

What are tectonic plates?

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

How are earthquakes measured?

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

Magnitude

Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. A loose network of seismographs has been installed all over the world to help record and verify earthquake events.

There are several scales that measure the magnitude of an earthquake. The most well-known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number. It is important to note that the Richter Scale is used only to determine the magnitude of an earthquake, it does not assess the damage that results.

Once an earthquake's magnitude has been confirmed, it can be classified. **Figure 191** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

Figure 191
Earthquake Magnitude Classes

Class	Magnitude (Richter Scale)
micro	smaller than 3.0
minor	3.0 – 3.9
light	4.0 – 4.9
moderate	5.0 – 5.9
strong	6.0 – 6.9
major	7.0 – 7.9
great	8.0 or larger

Source: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis

Intensity

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Although numerous intensity scales have been developed over the years, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.)

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure 192** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

Figure 192
Comparison of Richter Scale and Modified Mercalli Intensity Scale

Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage.
4.0	IV	Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage.
4.1 – 4.9	V	Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage.
5.0 – 5.9	VI	Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage.
6.0	VII	Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall.
6.1 – 6.9	VIII	Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall.
7.0	IX	Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable.
7.1 – 7.9	X	Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides.
8.0	XI	Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction.
> 8.0	XII	Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air.

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

When and where do earthquakes occur?

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

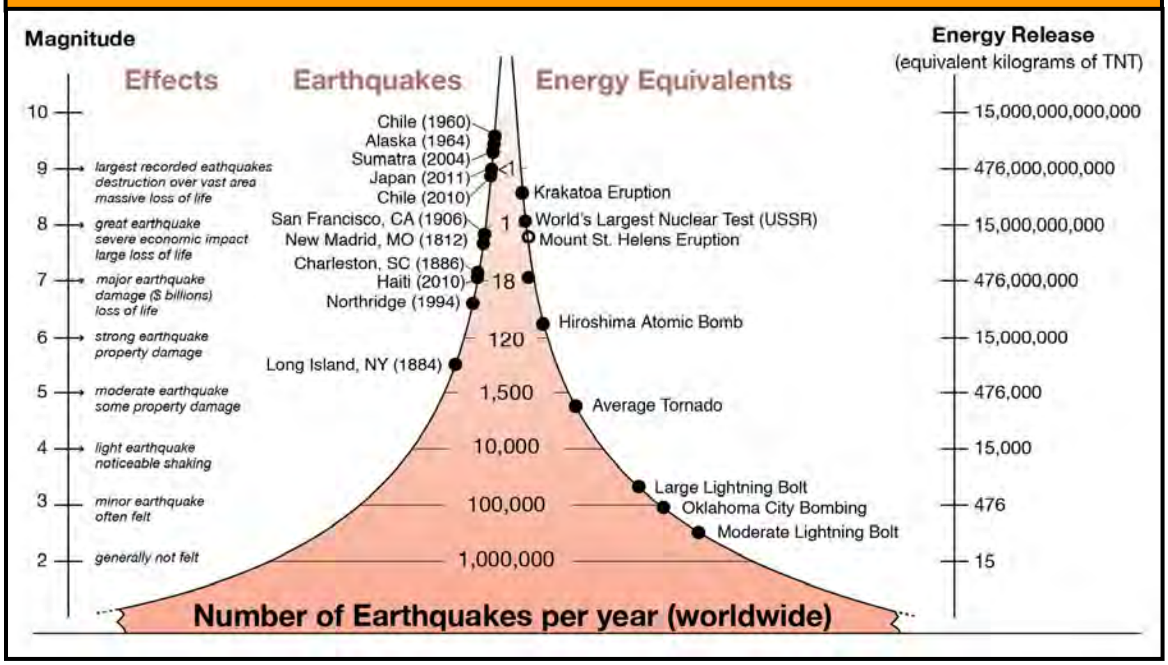
The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

How often do earthquakes occur?

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure 193** illustrates the approximate number of earthquakes that occur worldwide per year based on magnitude. This figure also identifies manmade and natural events that release approximately the same amount of energy for comparison.

Figure 193
Approximate Number of Earthquakes Recorded Annually



Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

3.8.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Tazewell County. However, there is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 194** illustrates the location of this geologic structure.

Figure 194
Geological Structures in Central Illinois

Source: Illinois State Geological Survey.

When have earthquakes occurred previously? What is the extent of these previous quakes?

According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, no earthquakes have originated in Tazewell County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure 195** illustrates the epicenters of nearby earthquakes.

Earthquake Fast Facts – Occurrences

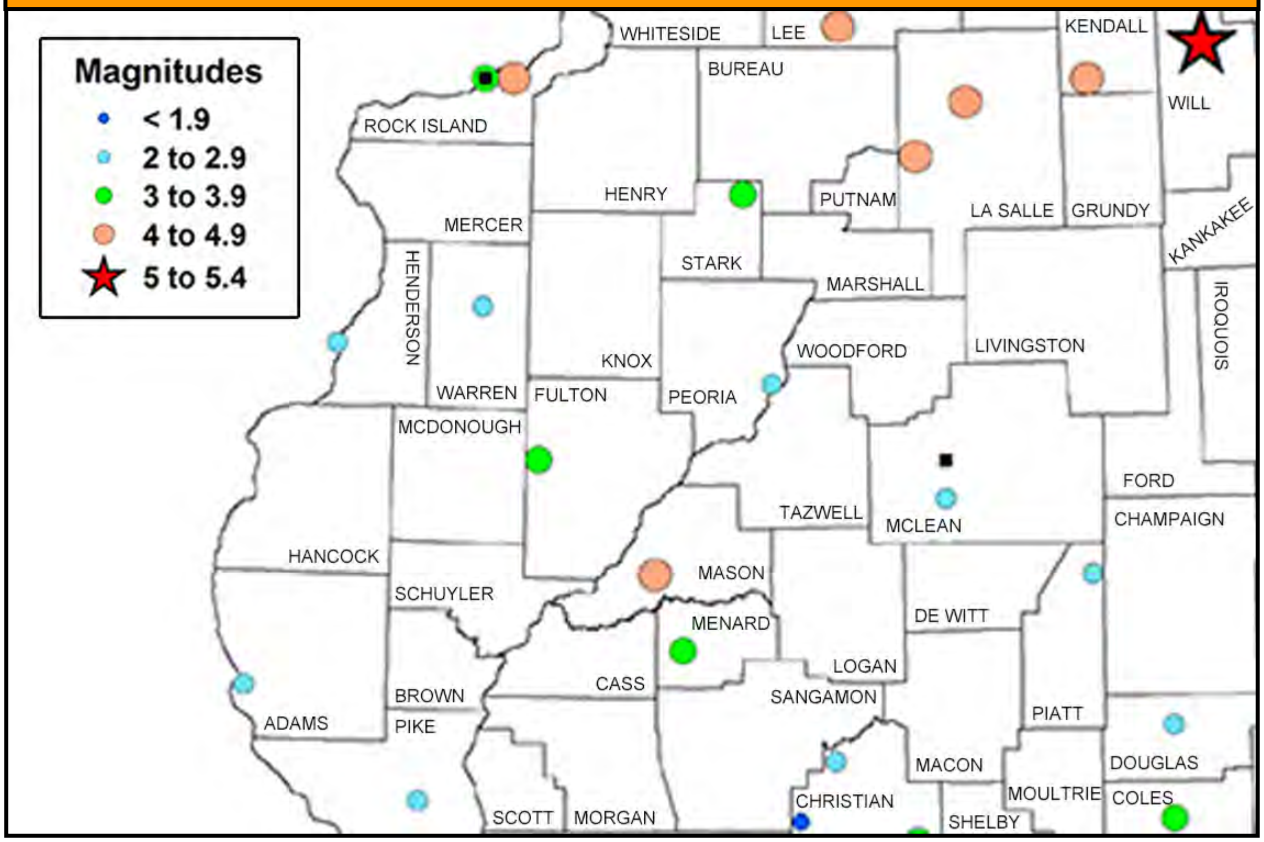
Earthquakes Originating in the County (1795 – 2015): ***0***

Fault Zones Located within the County: ***None***

Earthquakes Originating in nearby Counties (1795-2015): ***5***

Fault Zones Located in Nearby Counties: ***None***

Figure 195
Earthquakes Originating in Tazewell County



Source: Illinois State Geological Survey.

Central Illinois

Five earthquakes have originated in nearby Fulton, Mason, Peoria and McLean Counties. The following provides a brief description of each. Damage information was unavailable for either event.

➢ An estimated magnitude 3.7 earthquake originated in Fulton County just west of Marietta on March 13, 1956.

- On July 19, 1909 an earthquake with an estimated magnitude of 4.5 originated in Mason County approximately three miles north-northeast of Kilbourne.
- An earthquake originated in downtown Peoria in Peoria County on June 29, 1937 and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake.
- An estimated magnitude 3.4 earthquake originated approximately four miles south of Bloomington in unincorporated McLean County on December 27, 1885
- On February 4, 1883 an earthquake of undetermined magnitude originated at Normal in McLean County.

Southeastern Illinois

Tazewell County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.
- A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.
- The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies.

Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Tazewell County's proximity to geologic structures and fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for earthquakes as "guarded."

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Tazewell County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Tazewell County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Tazewell County would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability to:

- Public Health & Safety: Light/Moderate Quake – ***Low***
- Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
- Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
- Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
- Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – ***Medium***

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Tazewell County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

What impacts resulted from the recorded earthquake events?

While Tazewell County residents felt the earthquakes that occurred in 2008, 1987 and 1968, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Tazewell County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 196** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Tazewell County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered low. This risk is elevated from low to low/medium for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to medium.

Figure 196
Potential Earthquake Impacts – Tazewell County

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstates, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from earthquakes. However, given the County's size (just over 135,000 individuals), it's population density, the fact that there are not many buildings higher than two stories (with the exception of grain elevators and several multi-story buildings in Pekin and East Peoria) and earthquakes larger than magnitude 5.0 are not expected in this region, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake were to occur in the region then unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy form an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. In this scenario building damage in Tazewell County could range from moderate to considerable in well-built structures to severe in poorly -built structures.

A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating jurisdictions is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction to infrastructure and critical facilities to a strong earthquake.

An earthquake also has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be low, while the risk from a major or great earthquake is likely to be medium.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from earthquakes. While the County and all of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in Tazewell County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. In addition, there is insufficient data available to make useful predictions regarding potential earthquake damages through the use of computer modeling.

Given Tazewell County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.8.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Woodford County. However, there is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 197** illustrates the location of this geologic structure.

When have earthquakes occurred previously? What is the extent of these previous quakes?

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***0***

Fault Zones Located within the County: ***None***

Earthquakes Originating in nearby Counties (1795-2015): ***5***

Fault Zones Located in Nearby Counties: ***None***

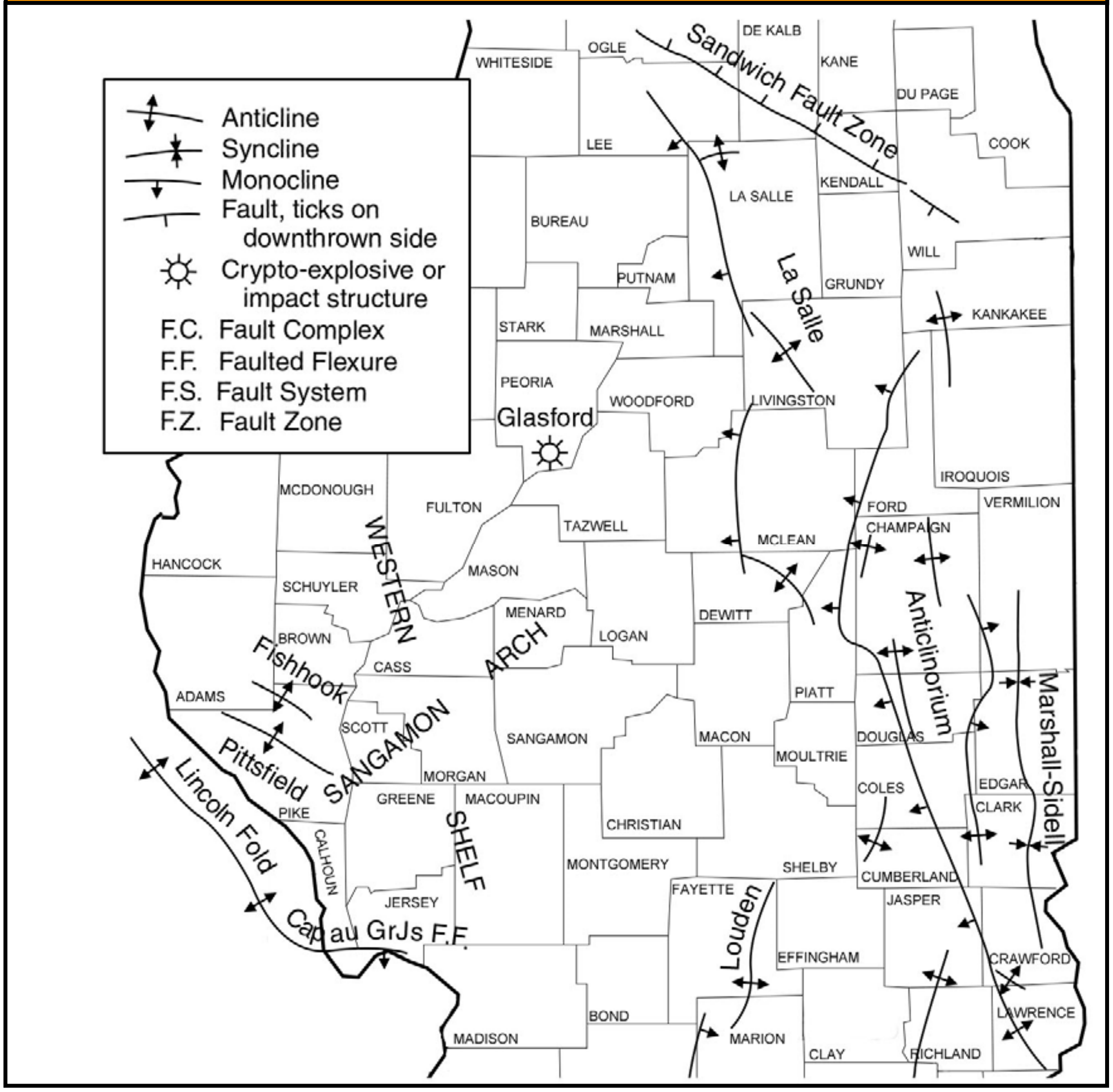
According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, no earthquakes have originated in Woodford County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure 198** illustrates the epicenters of nearby earthquakes.

Central Illinois

Five earthquakes have originated in nearby LaSalle, Peoria and McLean Counties. The following provides a brief description of each. Damage information was either unavailable or none was reported for any of the events.

- On June 28, 2004 a magnitude 4.2 earthquake originated approximately eight miles northwest of Ottawa in LaSalle County. Ground shaking was felt across six states. There were no reports of significant damage.
- An earthquake originated in downtown Peoria in Peoria County on June 29, 1937 and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake.
- An estimated magnitude 3.4 earthquake originated approximately four miles south of Bloomington in unincorporated McLean County on December 27, 1885
- On February 4, 1883 an earthquake of undetermined magnitude originated at Normal in McLean County.
- An estimated magnitude 4.6 earthquake originated approximately two miles west of Oglesby in LaSalle County on May 27, 1881.

Figure 197
Geological Structures in Central Illinois



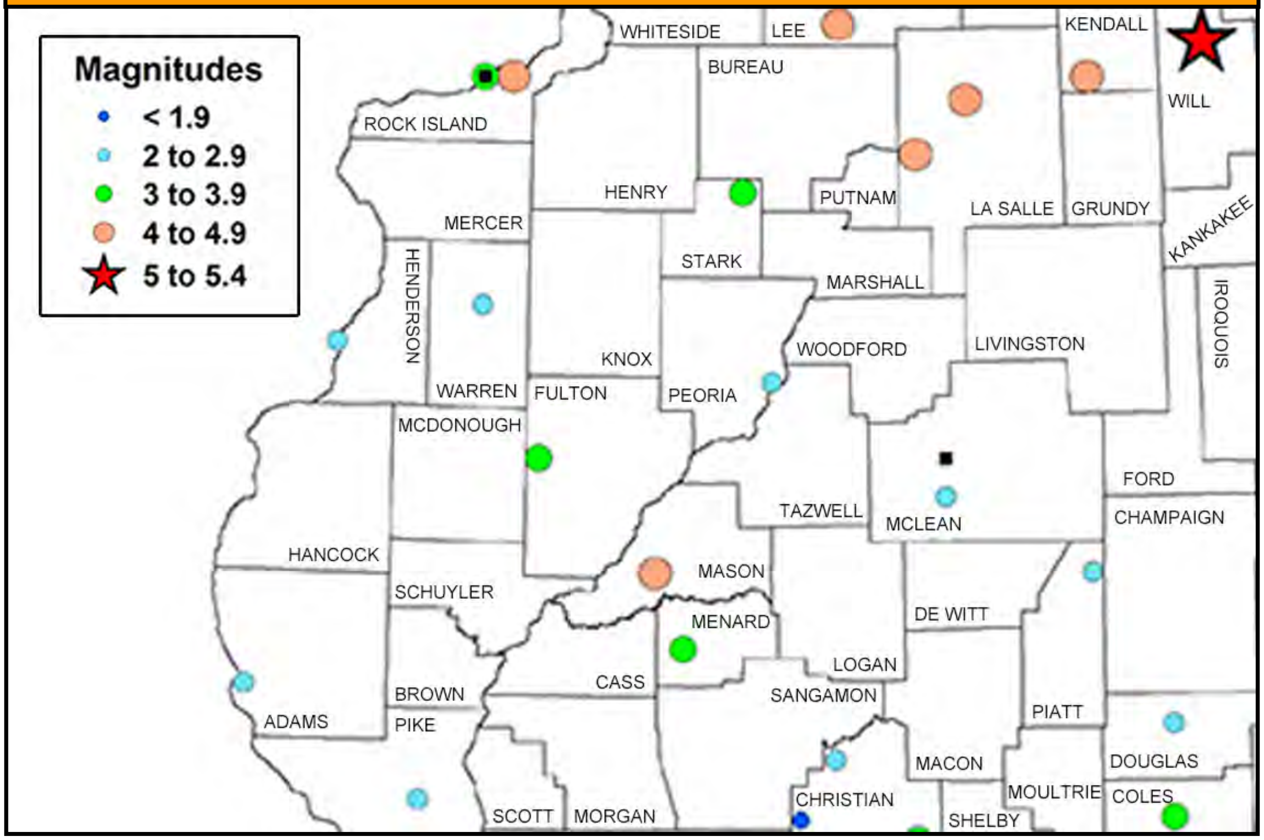
Source: Illinois State Geological Survey.

Southeastern Illinois

Woodford County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.

Figure 198
Earthquakes Originating in Woodford County



Source: Illinois State Geological Survey.

❖ A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.

❖ The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Woodford County's proximity to geologic structures and fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for earthquakes as "guarded."

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Woodford County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Woodford County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Woodford County would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Woodford County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability to:
- Public Health & Safety: Light/Moderate Quake – ***Low***
- Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
- Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
- Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
- Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – j ***Medium***

What impacts resulted from the recorded earthquake events?

While Woodford County residents felt the earthquakes that occurred in 2008, 2004, 1987 and 1968, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Woodford County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 199** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Woodford County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered low. This risk is elevated from low to low/medium for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to medium.

Figure 199
Potential Earthquake Impacts – Woodford County

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstate, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from earthquakes. However, given the County's size (just over 38,000 individuals), it's population density, the fact that there are very few buildings higher than two stories (with the exception of grain elevators and several three to four story buildings in Eureka) and earthquakes larger than magnitude 5.0 are not expected in this regions, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake were to occur in the region then the unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. In this scenario buildings damage in Woodford County could range from moderate to considerable in well-built structures to severe in poorly-built structures.

A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating jurisdictions is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction to infrastructure and critical facilities to a strong earthquake.

An earthquake has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be low, while the risk from a major or great earthquake is likely to be medium.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from earthquakes. While two of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in Woodford County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. In addition, there is insufficient data available to make useful predictions regarding potential earthquake damages through the use of computer modeling.

Given Woodford County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.8.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING JURISDICTIONS)

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Peoria County. The ISGS acknowledges the presence of the Glasford Structure within the County but considers this formation a probable meteorite impact feature and not a geologic structure with the potential to cause an earthquake. There is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 200a** illustrates the location of this geologic structure.

When have earthquakes occurred previously? What is the extent of these previous quakes?

According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, one earthquake has originated in participating Peoria County jurisdictions during the last 200 years. **Figure 200b** illustrates the epicenter of this earthquake. On June 29, 1937 an earthquake originated in downtown Peoria and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake. Damage information was unavailable for this event.

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***1***

Fault Zones Located within the County: ***None***

Earthquakes Originating in nearby Counties (1795-2015): ***3***

Fault Zones Located in Nearby Counties: ***None***

Peoria County residents, including those in the participating jurisdictions, have also felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description by region, of these events.

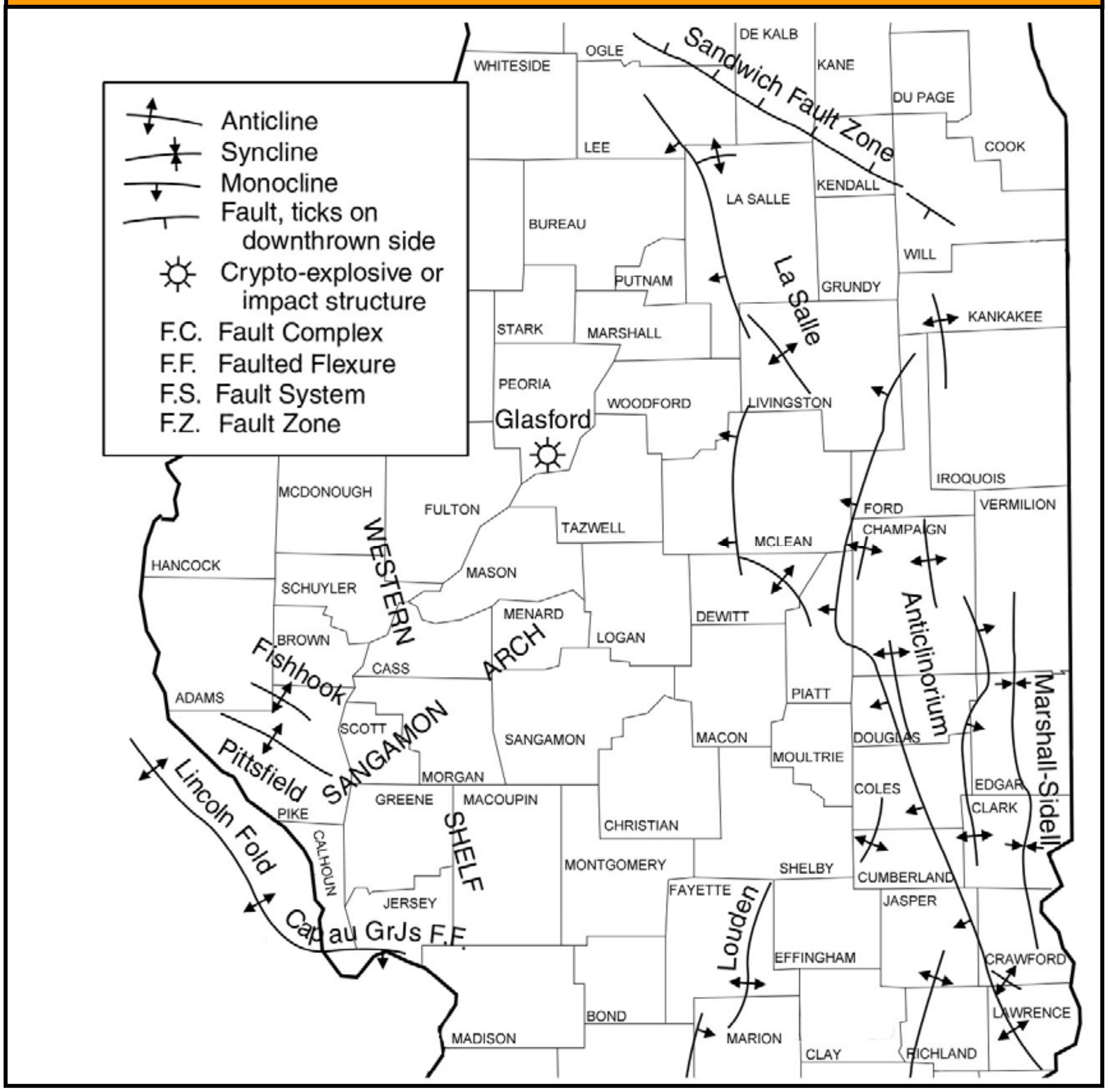
Central Illinois

Two earthquakes have originated in nearby Fulton and Stark Counties. The following provides a brief description of each. Damage information was unavailable for either event.

- An estimated magnitude 3.7 earthquake originated in Fulton County just west of Marietta on March 13, 1956.

- ➢ On March 1, 1942 an earthquake originated in Stark County approximately 2 ½ miles northwest of Bradford and was originally estimated as a magnitude 4.0; however, ISGS re-evaluated this event and determined that it was between a 3.0 and 3.9 magnitude earthquake.

Figure 200a
Geological Structures in Central Illinois



Source: Illinois State Geological Survey.

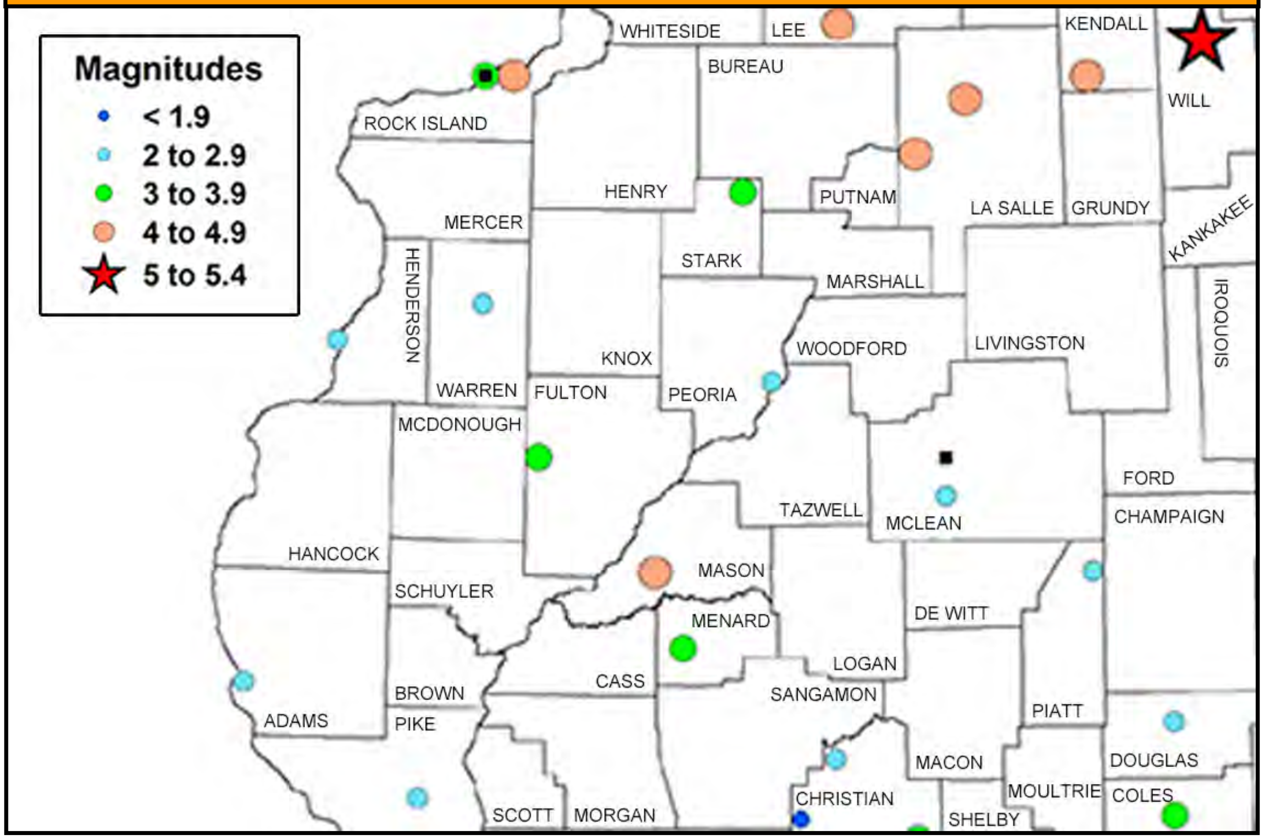
Southeastern Illinois

Peoria County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois.

- ❖ On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and

Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.

Figure 200b
Earthquakes Originating in Peoria County



Source: Illinois State Geological Survey.

❖ A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.

❖ The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central

Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

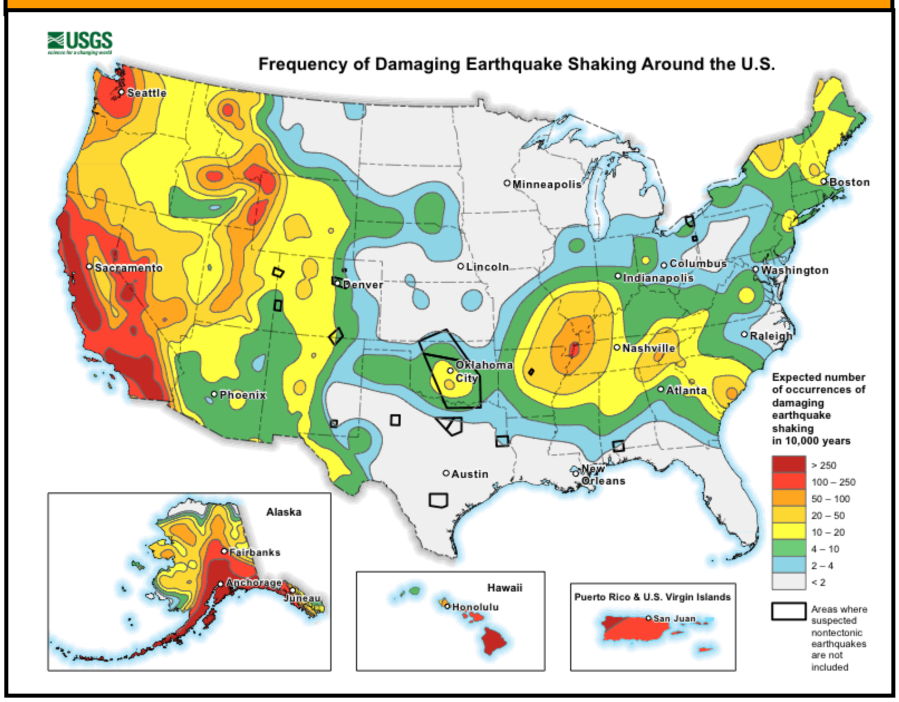
The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County, including the participating jurisdictions. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Peoria County's proximity to geologic structures and fault zones, both large and small, makes the entire area, including the participating jurisdictions, likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for earthquakes as "guarded."

According to the USGS, Peoria County can expect 2 to 4 occurrences of damaging earthquake shaking over a 10,000-year period. **Figure 201** illustrates the frequency of damaging earthquake shaking around the U.S.

Figure 201
Frequency of Damaging Earthquake Shaking Around the U.S.



Source: United State Geological Survey.

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of participating Peoria County jurisdictions are vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Peoria County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability to:

- Public Health & Safety: Light/Moderate Quake – ***Low***
- Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
- Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
- Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
- Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – ***Medium***

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Peoria County (including the participating jurisdictions) would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Peoria County is not vulnerable to damaging earthquakes. This perception has allowed the participating jurisdictions to develop largely without regard to earthquake safety.

What impacts resulted from the recorded earthquake events?

Property damage information was either unavailable or none was recorded for the one documented earthquake that occurred in Peoria County. While Peoria County residents felt the earthquakes that occurred in central and southern Illinois, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Peoria County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 202** details the potential impacts that may be experienced by the participating jurisdictions should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Peoria County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated to ***low/medium*** for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to ***medium***.

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in the participating jurisdictions are vulnerable to damage from earthquakes. However, given that there are no faults or geologic structures in the immediate vicinity; the fact that there are very few multi-story buildings (with the exception of downtown Peoria and the medical district); and earthquakes larger than magnitude 5.0 are not expected in the region; the damage is anticipated to be slight with only superficial structural damage such as broken windows and cracks in weak plaster and masonry.

Figure 202 Potential Earthquake Impacts – Peoria County (including the Participating Jurisdictions)	
Direct	**Indirect**
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstates, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the participating municipalities which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

While unlikely, if a strong earthquake (6.0 – 6.9) were to occur in the region then unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy form an earthquake while wood buildings with proper foundation ties rarely collapsed in earthquakes. In this scenario building damage in the participating jurisdictions could range from moderate to considerable in well-built structures to severe in poorly-built structures.

The GPSD provided a listing of the unreinforced masonry buildings that serve as critical infrastructure the District. Based on information provided, 13 of the District's 19 lift stations are housed in unreinforced masonry buildings. The remaining lift stations are not contained in any sort of structure. A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating municipalities is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction in infrastructure and critical facilities to a strong earthquake within the municipalities.

An earthquake has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the jurisdictions, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be ***low***, while the risk from a major or great earthquake is likely to be ***medium***.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in the participating jurisdictions are vulnerable to damage from earthquakes. While all of the participating jurisdictions have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in the participating Peoria County jurisdictions, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the 2016 Peoria County Tax Computation Report made available by the Peoria County Clerk, the total equalized assessed values (EAV) of the property (including structures) for the participating jurisdictions are as follows:

- Bartonville – $102,274,289
- Chillicothe – $99,615,325
- GPSD – $2,401,347,599
- Hanna City – $17,893,921
- Peoria – $2,154,664,651
- Peoria Heights – $97,759,569

Since all property in the planning area is susceptible to earthquake impacts to varying degrees, this total represents participating jurisdiction's property exposure to earthquake events.

Given Peoria County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.9 MINE SUBSIDENCE

HAZARD IDENTIFICATION

What is a mine?

A mine is a pit or excavation made in the earth for the purpose of extracting minerals or ore. Mines were developed in Illinois to extract coal, clay, shale, limestone, dolomite, silica sand, tripoli, peat, ganister, lead, zinc and fluorite.

What is mining?

Mining is the process of extracting minerals or ore from a mine. There are two common mining methods: surface mining and sub-surface (underground) mining. This section focuses on underground mining practices since surface mining was not conducted in Tazewell County, Woodford County or any of the participating Peoria County municipalities.

Mining has long figured prominently into Illinois' history. According to the Illinois State Geological Survey (ISGS), Illinois has the third largest recoverable reserves of coal in the country, behind only Montana and Wyoming. Coal deposits can be found under 86 of the 102 counties in Illinois and underground mining operations have been conducted in at least 72 counties. **Figure 203** shows the extent of coal deposits (Pennsylvanian rocks) present in Illinois and the mined-out areas from surface and underground coal mining. In 2015, Illinois ranked fourth in the United States in coal production according to the National Mining Association.

The first commercial coal mine in Illinois is thought have started in Jackson County about 1810. Since that time, there have been more than 3,800 underground coal mines and 363 underground metal and industrial mineral mines operated in Illinois. Almost all of these mines have been abandoned over the years. According to ISGS, there were 12 active underground coal mines in Illinois in 2015. The United States Geological Survey identified 10 active metal and industrial mineral underground mines in Illinois.

What methods are used in underground mining?

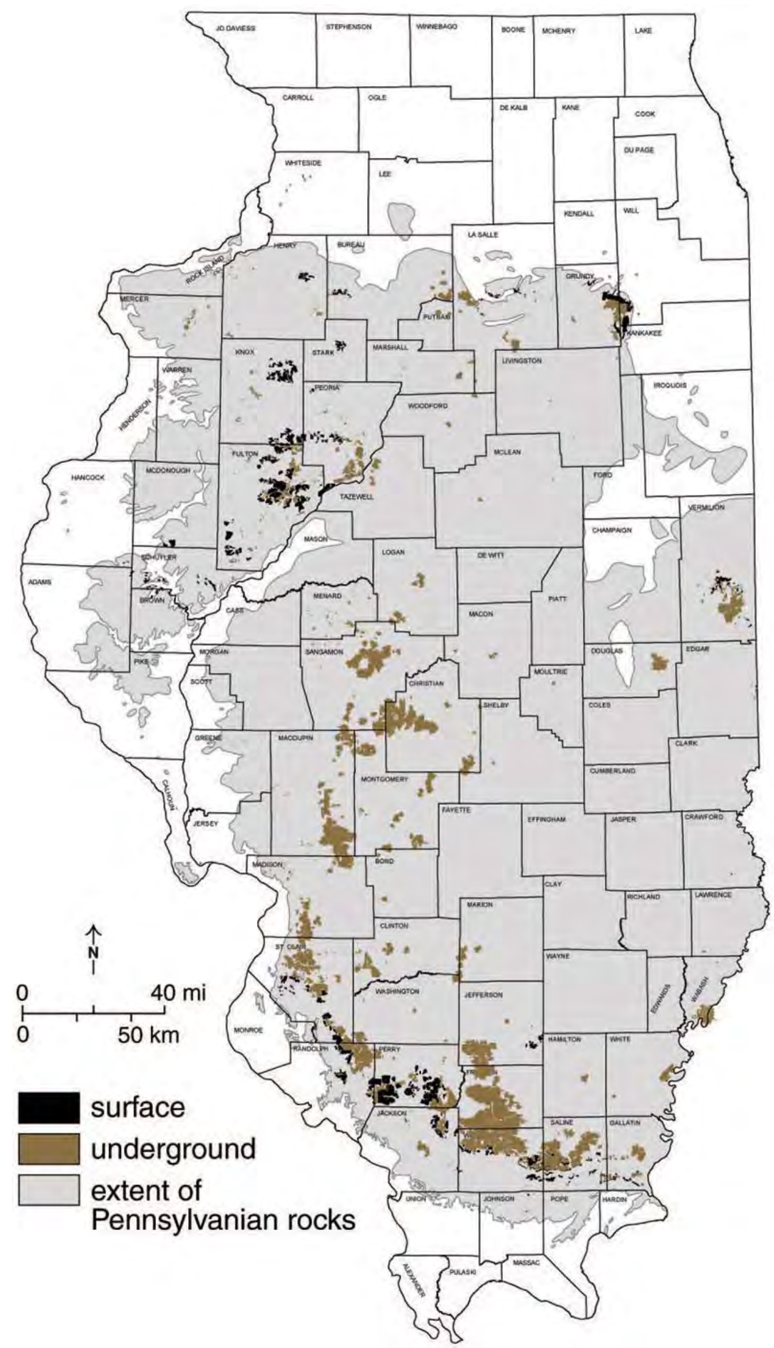
Much of Illinois coal lies too deep for surface mining and requires extraction using underground mining methods. There are three main methods of underground mining that have been used in Illinois over the years: room-and-pillar, high-extraction retreat and longwall. The following provides a brief description of each.

Room-and-Pillar

In the room-and-pillar system, the areas where coal is removed are referred to as "rooms" and the blocks of coal left in place to support the mine's roof and surface are referred to as "pillars". A "panel" refers to a group of rooms isolated from other room groups by surrounding pillars and generally accessed from only one entryway. The room-and-pillar method that was generally used before the early 1900s was characterized by rooms that varied considerably in length, width and sometimes direction, forming irregular mining patterns.

Modern room-and-pillar mines have a regular configuration of production areas (panels) and entryways, and the rooms and entries range from 18 to 24 feet, which is considerably narrower than in older mines. Generally modern room-and-pillar mining methods recover less than 50% to 60% of the coal in a panel. Most underground mines in Illinois have used a type of room-and-pillar pattern.

Figure 203
Coal Mine Deposits & Mined Areas in Illinois



Source: Illinois Department of Natural Resources & Illinois State Geological Survey.

High-Extraction Retreat

High-extraction retreat mining operations first develop a room-and-pillar production area (panel). The miners then systematically begin taking additional coal from the pillars that are left behind. The secondary extraction occurs in a retreating fashion, working from the outer edges of the panel to the main entries. Most of the coal pillars which support the roof are removed shortly after a few rows of rooms and pillars have been formed, leaving only small pillars.

The size and number of pillars left to maintain worker safety varies depending on underground geologic conditions. Roof collapses are controlled by the use of temporary roof supports and planned subsidence of the surface is initiated immediately. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. High-extraction retreat methods recover up to 80% to 90% of the coal in a panel. No Illinois mines currently use high-extraction retreat mining, but from the 1940s to 2002, this method was used in the State.

Longwall

Modern longwall mining methods remove coal along a straight working face within defined panels (in this case a solid block of coal), up to 1 to 2 miles long and about 1,000 feet wide. Room-and-pillar methods must be used in conjunction with longwall mining. Like high-extraction retreat, longwall mining begins at the outer edges and works toward the main entries. This fully-mechanized method uses a rotating cutting drum or shearer that works back and forth across the coal face. The coal falls onto a conveyer below the cutting machine and is transported out of the mine.

All of this is performed under a canopy of steel supports that sustains the weight of the roof along the mining surface. As the coal is mined the steel supports advance. The mine roof immediately collapses behind the moving supports, causing 4 to 6 feet of maximum settling of the ground surface over the panel. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. Longwall mining methods recover 100% of the coal in a panel.

What is mine subsidence?

Mine subsidence is the sinking or shifting of the ground surface resulting from the collapse of an underground mine. Subsidence is possible in any area where minerals or ore have been undermined. Most of the mine subsidence in Illinois is related to coal mining, which represents the largest volume extracted and area undermined of any solid commodity in the State.

Mine subsidence can be planned, as with modern high-extraction retreat and longwall mining techniques, or it can occur as the result of age and instability. For many years, underground mining was not tightly regulated and not much thought was given to the long-term stability of the mines since most of the land over the mine was sparsely populated. Once mining operations were complete, the mine was abandoned. As cities and towns grew up around the mines, many urban and residential areas were built over or near undermined areas.

ISGS estimates that approximately 333,000 housing units are located in close proximity to underground mines and may potentially be exposed to mine subsidence while approximately 201,000 acres of urban and developed land overlie or are immediately adjacent to underground mines. Most experts agree that room-and-pillar mines will eventually experience some degree of subsidence, but currently there is no way to know when or exactly where it will occur.

What types of mine subsidence can occur in Illinois?

In Illinois mine subsidence typically takes one of two forms: pit subsidence or sag (trough) subsidence. The following provides a brief description of each.

Pit Subsidence

Pit subsidence generally occurs when the roof of a shallow mine (less than 100 feet deep) collapses and forms a bell-shaped hole at the ground's surface, 6 to 8 feet deep and 2 to 40 feet across. **Figure 204** provides an illustration of pit subsidence. This type of subsidence forms very quickly causing sudden and swift ground movement. While the probability of a structure being damaged by pit subsidence is generally low since most pits are relatively small, structural damage can occur if pit subsidence develops under the corner of a building, the support posts of a foundation or another critical spot.

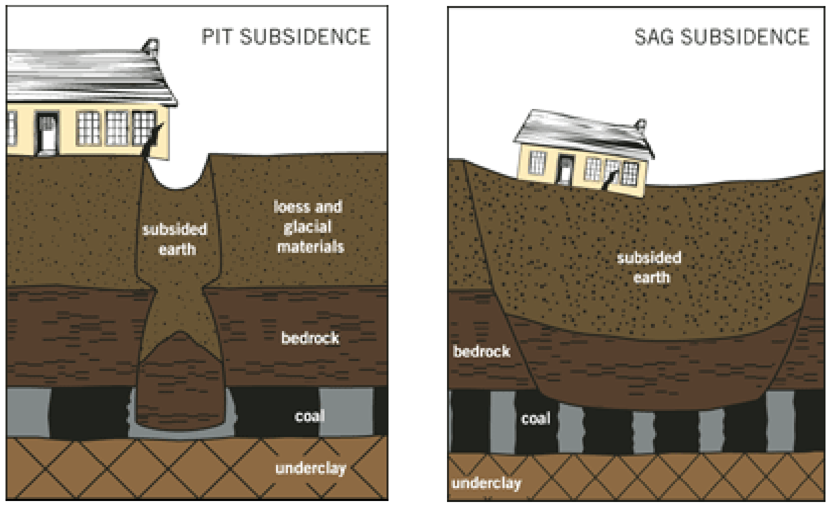
Sag (Trough) Subsidence

Sag or trough subsidence generally forms a gentle depression in the ground's surface that can spread over an entire mine panel and affect several acres of land. A major sag can develop suddenly within a few hours or days, or gradually over years. This type of subsidence may originate over places in the mine where pillars have disintegrated and collapsed or where pillars are being pushed into the relatively soft underclay that forms the floor of most mines. **Figure 204** illustrates sag subsidence. This is the most common type of mine subsidence and can develop over mines of any depth. Given the relatively large area covered by sag subsidence, buildings, roads, driveways, sidewalks, sewer and water pipes and other utilities may experience damage.

What is the Illinois Mine Subsidence Insurance Fund?

Prior to 1979, traditional property owner's insurance did not cover mine subsidence nor was mine subsidence coverage available for purchase in Illinois. Since many mining companies in Illinois ceased operations long before mine subsidence occurred and insurance did not cover such damage, property owner who experienced subsidence damage had no recourse. Several high-profile incidents in the Metro East St. Louis area ultimately led to the passage of the Mine Subsidence Insurance Act in 1979. The Statute required insurers to make mine subsidence insurance available to Illinois homeowners and established the Illinois Mine Subsidence Insurance Fund (IMSIF). Later amendments to the Act gave the Fund the authority, with approval from the Director of Insurance, to set the maximum limits for mine subsidence coverage.

Figure 204
Types of Mine Subsidence



Source: Illinois Mine Subsidence Insurance Fund.

The IMSIF is a taxable enterprise created by Statute to operate as a private solution to a public problem. The purpose of the Fund is to assure financial resources are available to owners of property damaged by mine subsidence. The Fund fills a gap in the insurance market for the benefit of Illinois property owners at risk of experiencing mine subsidence damage.

All insurance companies authorized to write basic property insurance in Illinois are required to enter into a Reinsurance Agreement with the Fund and offer mine subsidence insurance coverage. Mine subsidence insurance covers damage caused by underground mining of any solid mineral resource. In the 34 counties where underground mining has been most prevalent, the Statute requires mine subsidence coverage be automatically included in both residential and commercial property policies. Coverage may be rejected in writing by the insured. **Figure 205** identifies the 34 counties where mine subsidence insurance is automatically included in property insurance policies.

In addition to providing reinsurance to insurers, the Fund also is responsible for conducting geotechnical investigations to determine if mine subsidence caused the damage, establishing rates and rating schedules, providing underwriting guidance to insurers, supporting and sponsoring mine subsidence related research and initiatives consistent with the public interest and educating the public about mine subsidence issues.

Figure 205
Counties Required to include Mine Subsidence Coverage in Property Insurance

Source: Illinois Mine Subsidence Insurance Fund.

3.9.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the County?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Tazewell County, there are 27 documented underground mines located in the County. A copy of the

Directory is included in **Appendix L**. **Figure 206** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members did not identify any known recorded mine subsidence events in Tazewell County.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the County: ***27***

Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: ***High***

According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there were 16 confirmed mine subsidence claims submitted to the Illinois Mine Subsidence Insurance Fund for Tazewell County between 1999 and 2012. However, no information was available regarding mine subsidence events associated with these claims.

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 4,601 acres (1.1% of the land area) and 4,281 housing units (8.1% of the total housing units) in Tazewell County are located in Zone 1, land over or adjacent to mapped mines.
- ❖ An additional 3,687 acres (0.9% of the land area) and 3,258 housing units (6.2% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain.

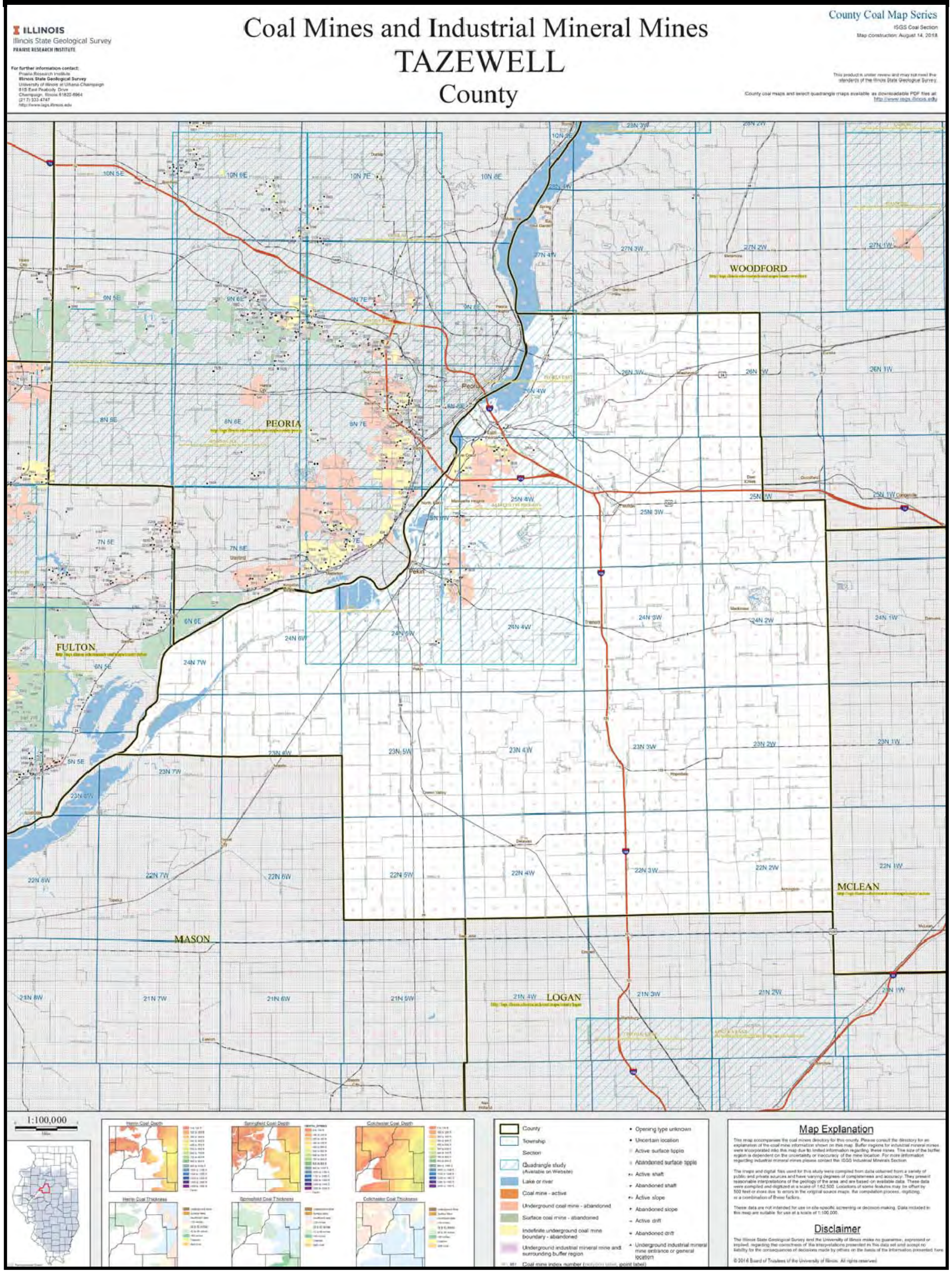
Figure 207 identifies the location of the Zone 1 and 2 areas in Tazewell County. Based on this mapping, mine subsidence has the potential to impact parts of unincorporated Tazewell County as well as Creve Coeur, East Peoria, Marquette Heights and Pekin, some of the more densely populated communities in the County.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for Tazewell County, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

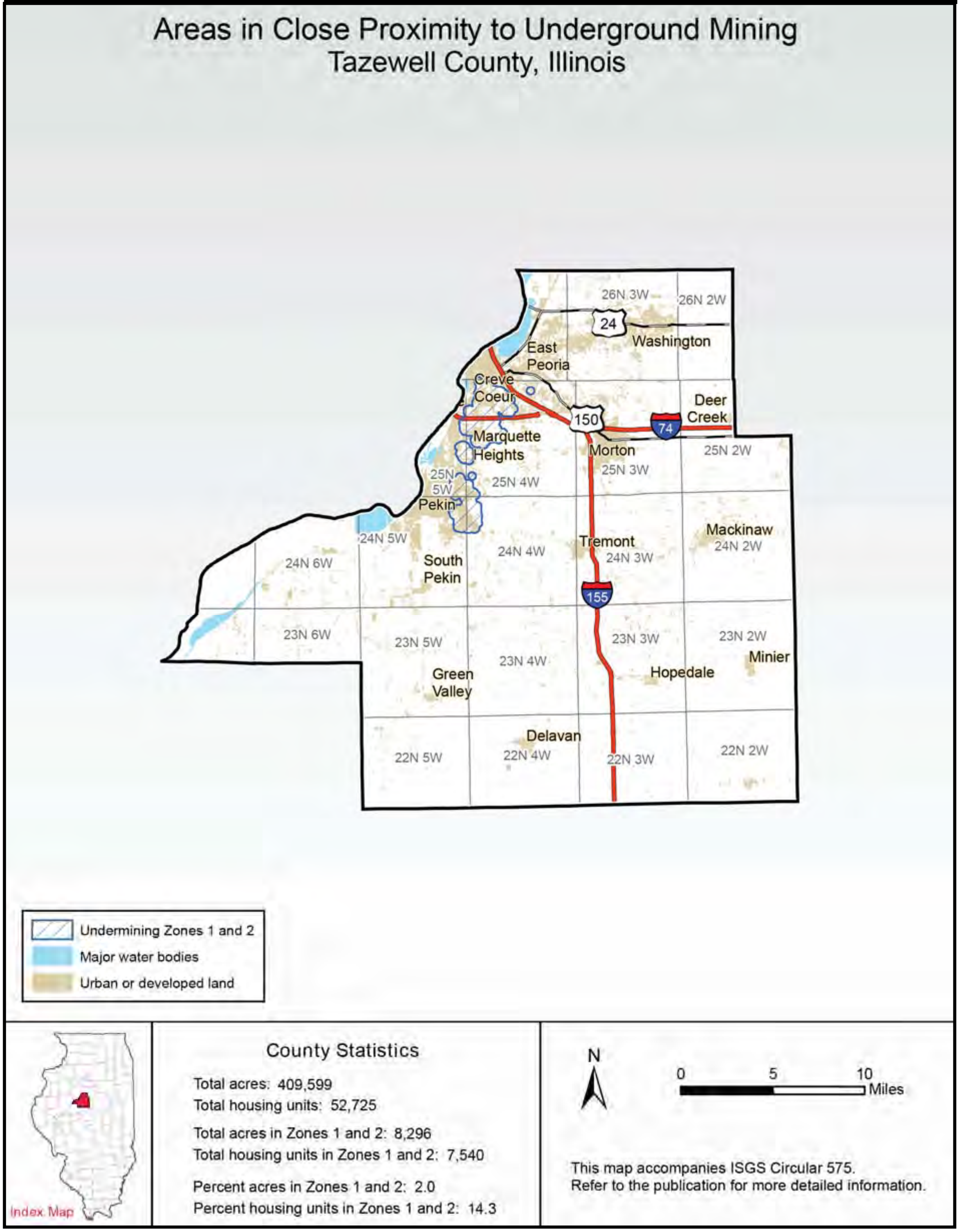
However, given the mining methods used, the age and location of the mines and the number of housing units located over or adjacent to undermined areas in the County, the probability that Tazewell County will experience future mine subsidence events is estimated to be ***high***.

Figure 206
Underground Mines Located in Tazewell County



Source: Illinois State Geological Survey

Figure 207
Areas Potentially Impacted by Mine Subsidence in Tazewell County



Source: Illinois State Geological Survey

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

Yes. East Peoria and Pekin as well as parts of unincorporated Tazewell County are vulnerable to mine subsidence. According to ISGS, approximately 4,609 acres (1.1% of the land area) of Tazewell County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,687 acres (0.9% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. These areas are all located along the western edge of the County near the Illinois River. None of the other participating municipalities or the remainder of the County are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:

- Public Health & Safety – Zones 1 & 2: ***Low***
- Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

What impacts resulted from the recorded mine subsidence events?

While 16 confirmed mine subsidence claims were submitted to the Illinois Mine Subsidence Insurance Fund for Tazewell County between 1999 and 2012, no information was available regarding the mine subsidence events that led to the claims. Since there is no available information on any *recorded* mine subsidence events in Tazewell County, there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- cracked, broken or damaged foundations
- cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- doors and windows stick, jam or break
- unlevel or tilted walls or floors
- doors swing open or closed
- chimney, porch or steps separate from the rest of the structure
- water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in Tazewell County is considered to be low for both Zones 1 and 2 and all other portions of the County.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 4,281 housing units (8.1% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,258 housing units (6.2% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain.

According to an analysis conducted for the original Plan developed in 2004, there are ten critical facilities located in or near undermined areas in the County, six schools/educational facilities and four communication transmitters. **Figure 208** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

Figure 208
Critical Facilities Located in or near Undermined Areas – Tazewell County

Critical Facility Name	Critical Facility Type	Location
Parkview Jr. High School	School	Creve Coeur
WHOI TV Channel 19	Communications	Creve Coeur
WCBU FM 89.9	Communications	East Peoria
WTVP TV Channel 47	Communications	East Peoria
WIRL AM 1290	Communications	Marquette Heights
Broadmoor Jr. High School	School	Pekin
Pekin High School	School	Pekin
Sunset Hills Elementary School	School	Pekin
Willow Elementary School	School	Pekin
Schramm Educational Center	School	Pekin

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in Tazewell County is considered to be medium for Zone 1 and low for Zone 2 and all other portions of the County.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those housing units that reside in Zones 1 have the potential to experience future dollar losses from mine subsidence.

3.9.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the County?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Woodford County, there are only four documented underground mines located in the County. A copy of the Directory is included in **Appendix L**. **Figure 209** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the County: ***4***

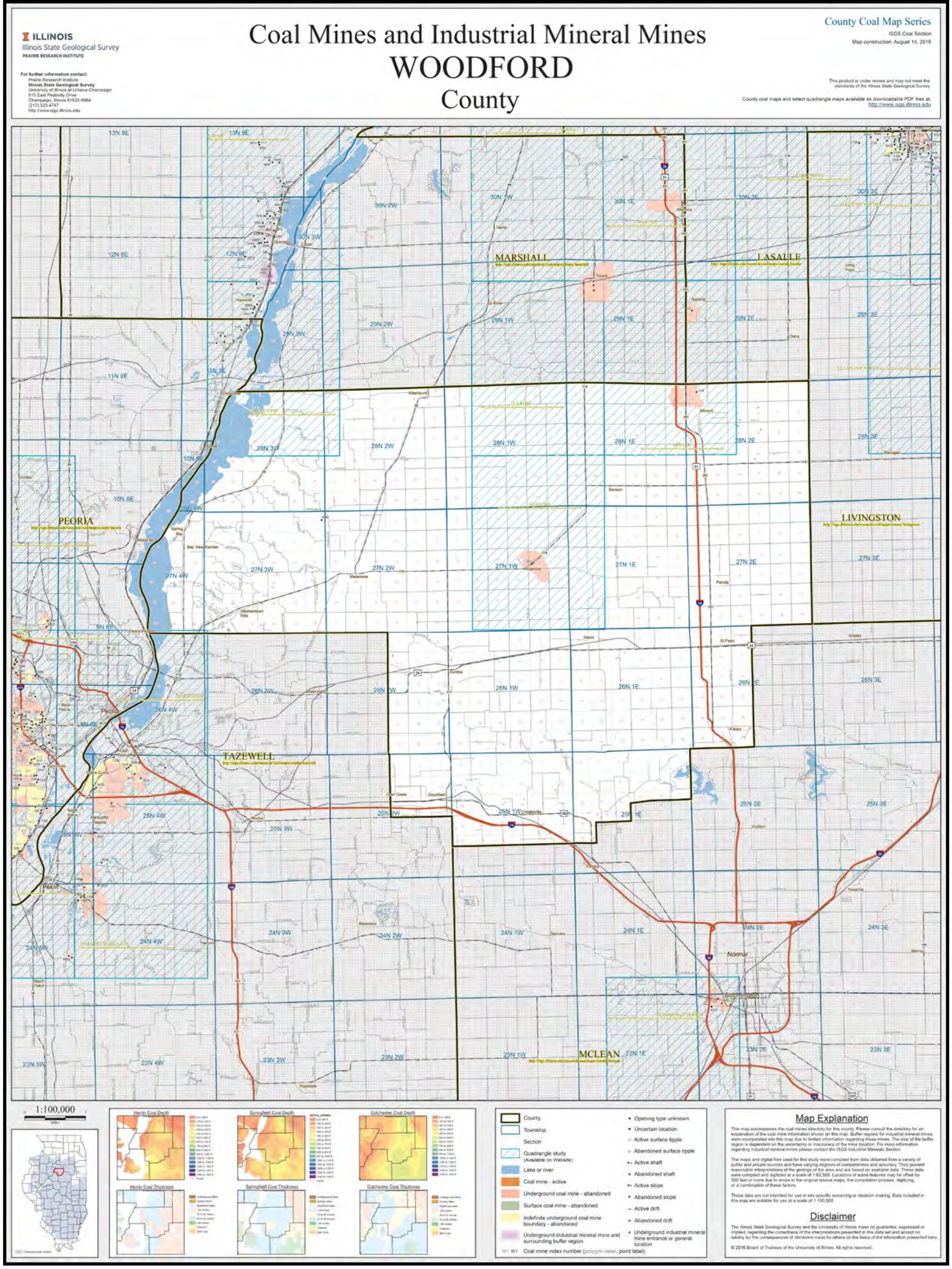
Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: ***Low***

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members and did not identify any known recorded mine subsidence events in Woodford County. According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there were no mine subsidence claims submitted to the Illinois Mine Subsidence Insurance Fund for Woodford County between 1999 and 2012.

Figure 209
Underground Mines Located in Woodford County



Source: Illinois State Geological Survey

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 2,255 acres (0.7% of the land area) and 618 housing units (4.6% of the total housing units) in Tazewell County are located in Zone 1, land over or adjacent to mapped mines.
- ❖ An additional 1,395 acres (0.4% of the land area) and 288 housing units (2.2% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain.

Figure 210 identifies the location of the Zone 1 and 2 areas in Woodford County. Based on this mapping, mine subsidence has the potential to impact parts of unincorporated Woodford County as well as Minonk and Roanoke.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for Woodford County, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

However, given the number, size and mining methods used, the probability that Woodford County will experience future mine subsidence events is estimated to be ***low***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

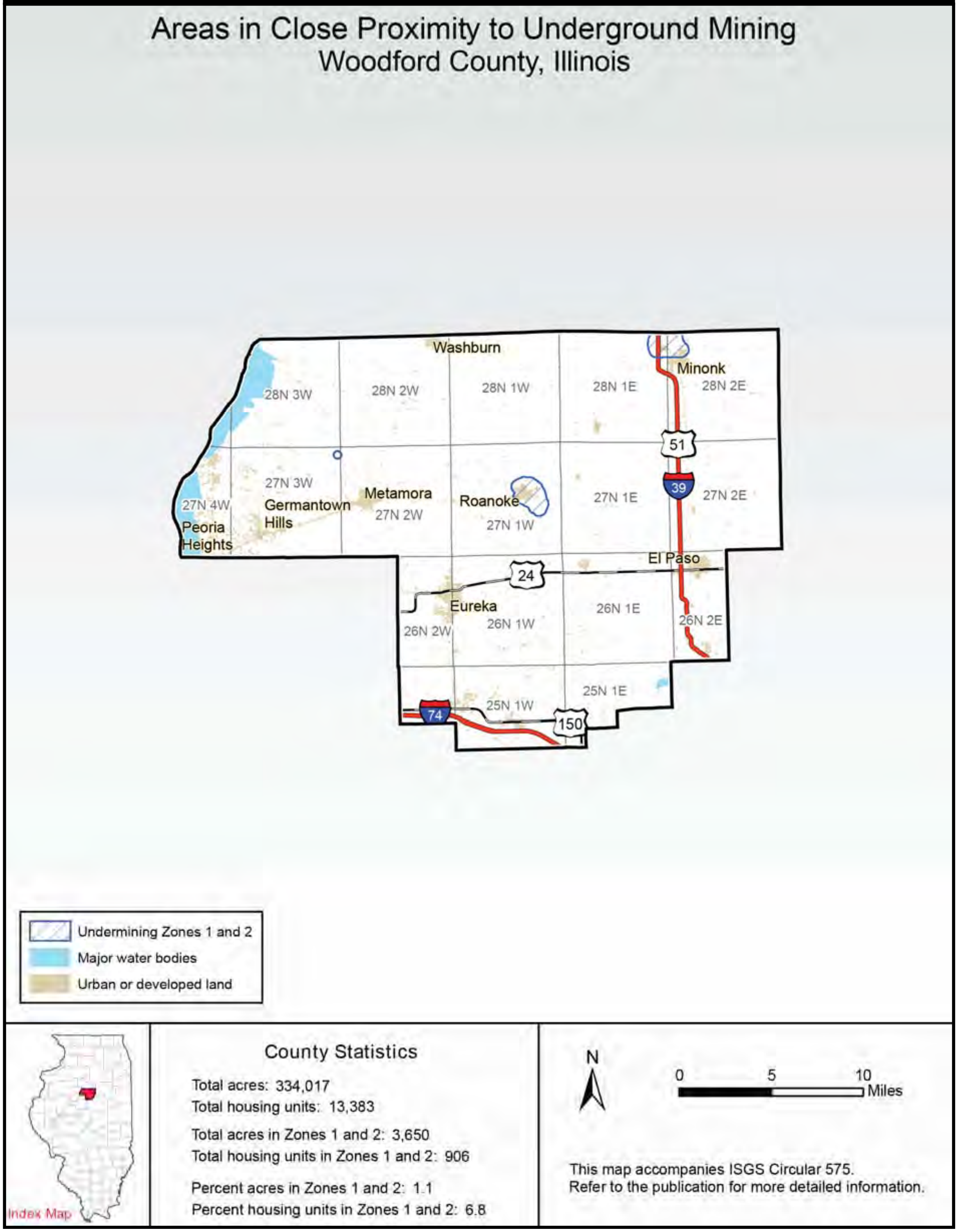
Yes. Roanoke and parts of unincorporated Woodford County are vulnerable to mine subsidence. According to ISGS, approximately 2,255 acres (0.7% of the land area) of Woodford County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 1,395 acres (0.4% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. These areas are primarily located in and around Roanoke and Minonk. None of the other participating municipalities or the remainder of the County are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:

- ❖ Public Health & Safety – Zones 1 & 2: ***Low***
- ❖ Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium to Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

Figure 210
Areas Potentially Impacted by Mine Subsidence in Woodford County



Source: Illinois State Geological Survey

What impacts resulted from the recorded mine subsidence events?

Since there have been no *recorded* mine subsidence events in Woodford County, there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- ❖ cracked, broken or damaged foundations
- ❖ cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- ❖ doors and windows stick, jam or break
- ❖ unlevel or tilted walls or floors
- ❖ doors swing open or closed
- ❖ chimney, porch or steps separate from the rest of the structure
- ❖ water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in Woodford County is considered to be low for both Zones 1 and 2 and all other portions of the County.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 618 housing units (4.6% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 288 housing units (0.4% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain.

According to an analysis conducted for the original Plan developed in 2004, there are four critical facilities located in or near undermined areas in the County, two educational facilities and two emergency service providers. **Figure 211** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

Figure 211
Critical Facilities Located in or near Undermined Areas – Woodford County

Critical Facility Name	Critical Facility Type	Location
Roanoke-Benson CUSD #60	School	Roanoke
Roanoke Fire Department	Emergency Services	Roanoke
Roanoke Police Department	Emergency Services	Roanoke
Sowers Elementary School	School	Roanoke

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in Woodford County is considered to be medium to low for Zone 1 and low for Zone 2 and all other portions of the County.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those housing units that reside in Zones 1 have the potential to experience future dollar losses from mine subsidence.

3.9.3 PARTICIPATING PEORIA COUNTY JURISDICTIONS

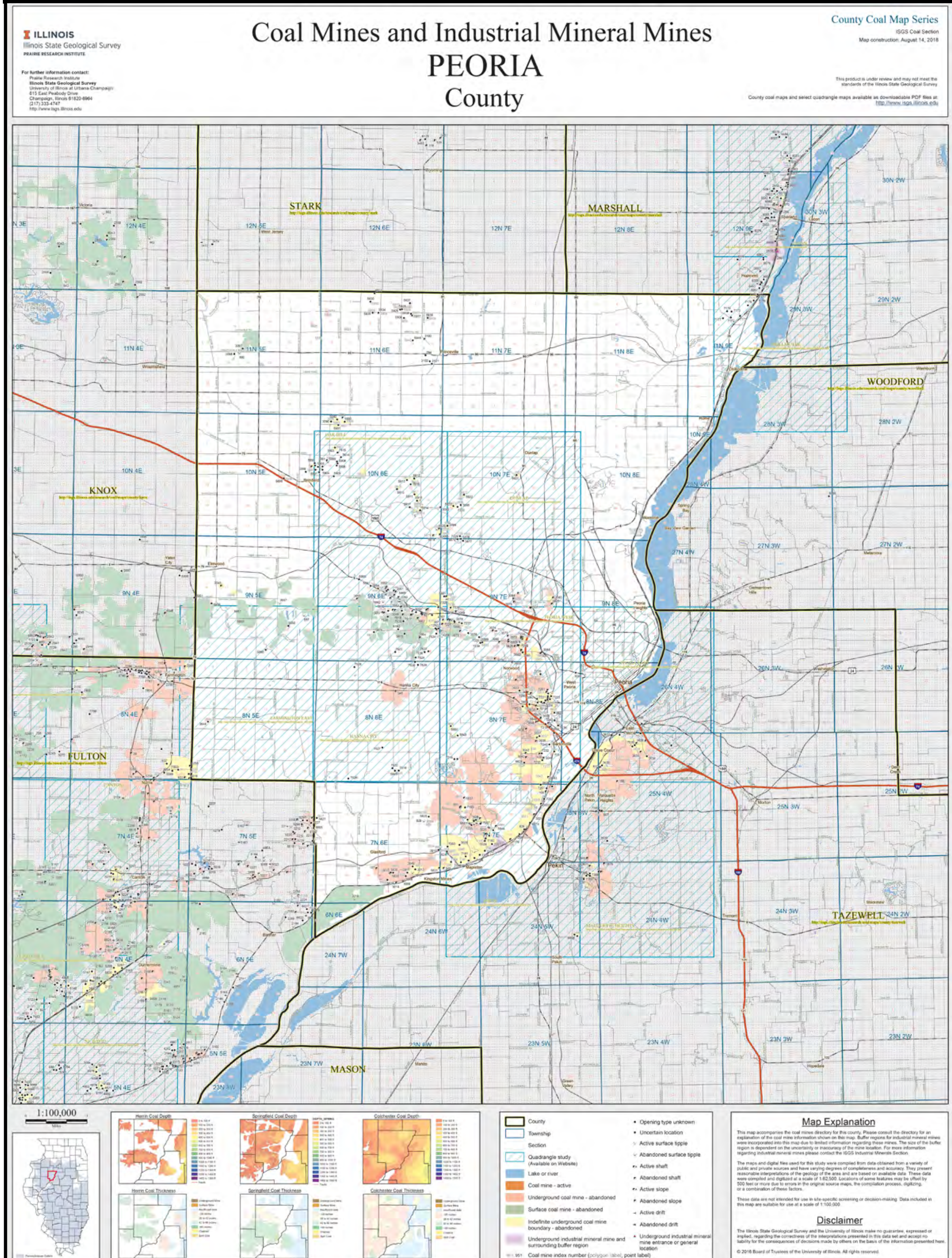
HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the participating Peoria County jurisdictions?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Peoria County, there are 25 documented underground mines located in the participating jurisdictions. A copy of the Directory is included in **Appendix L**. **Figure 112** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

Figure 112
Underground Mines Located in Peoria County



Source: Illinois State Geological Survey

Of the 25 documented underground mines, 19 are located in Bartonville, five are located in Peoria and one is located in Hanna City. Neither Chillicothe nor Peoria Heights have underground mines located within or near their municipal limits and there are no underground minds located within or near the GPSD's wastewater treatment facility.

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members did not identify any known recorded mine subsidence events in the participating Peoria County jurisdictions.

According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there was one confirmed mine subsidence claim submitted to the Illinois Mine Subsidence Insurance Fund for all of Peoria County between 1999 and 2012. However, no information was available regarding the mine subsidence event associated with this claim.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the Participating Municipalities: ***25***

Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: Bartonville & Hanna City – ***Medium to High***

Probability of Future Mine Subsidence Events: Peoria - ***Low***

What locations are affected by mine subsidence?

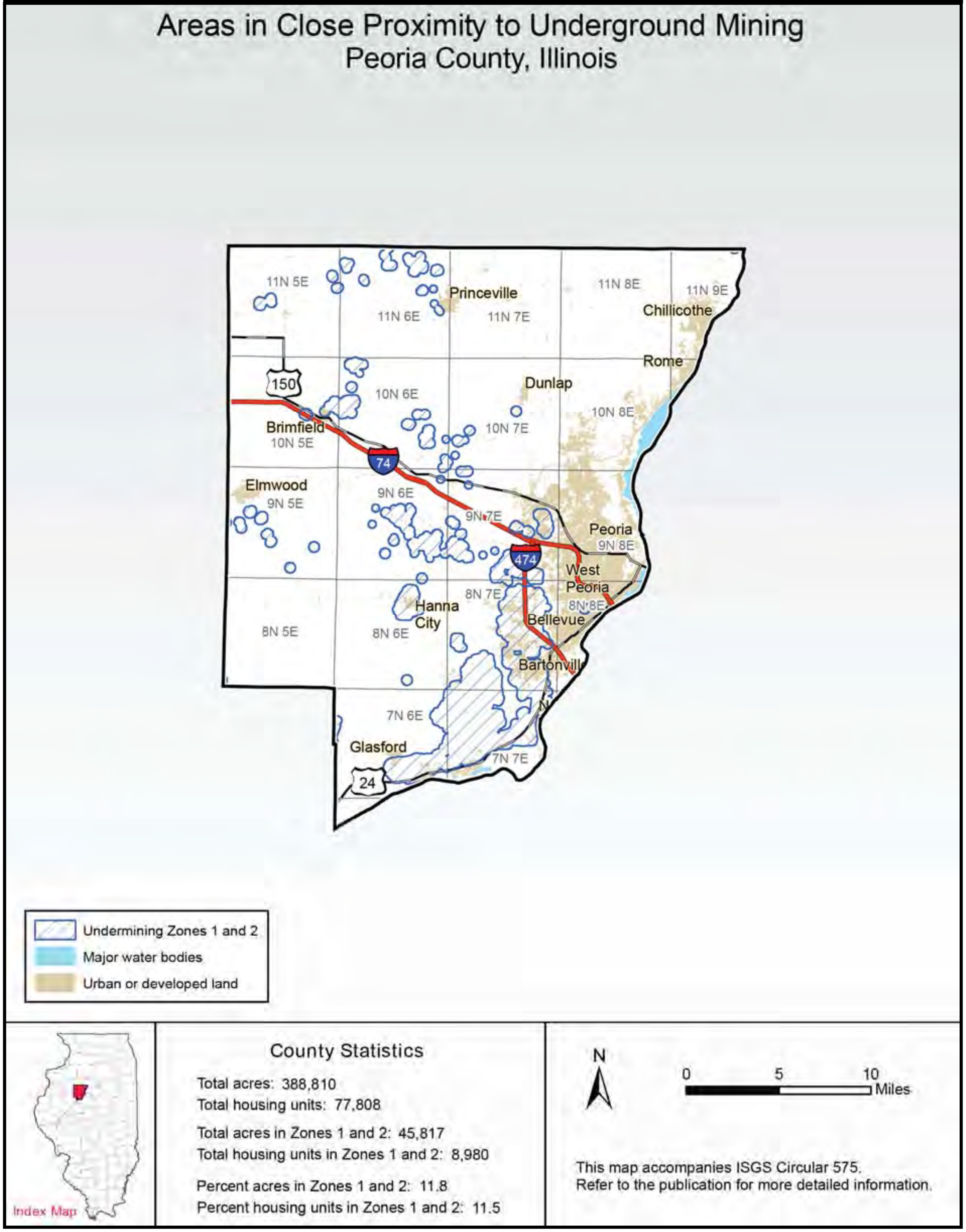
According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 21,292 acres (5.5% of the land area) and 5,213 housing units (6.7% of the total housing units) in Peoria County are located in Zone 1, land over or adjacent to mapped mines. A detailed breakdown by municipality was not available.
- ❖ An additional 24,526 acres (6.3% of the land area) and 3,768 housing units (4.8% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain. Again, a detailed breakdown by municipality was not available.

Figure 213 identifies the location of the Zone 1 and 2 areas in Peoria County. Based on this mapping, mine subsidence has the potential to impact Bartonville, Hanna City and Peoria as well as the GPSD's service area (including Bartonville, Bellevue and Peoria.)

The extent of future potential mine subsidence events is a function of where current development is located relative to areas of past and present underground mining. According to the IMSIF, most experts agree that room and pillar mines will eventually experience some degree of collapse, but currently there is no way to know when or exactly where mine subsidence will occur.

Figure 213
Areas Potentially Impacted by Mine Subsidence in Peoria County



Source: Illinois State Geological Survey

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for the participating Peoria County jurisdictions, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

However, given the mining methods used, the number, age, size and location of the mines, the probability that Bartonville, Hanna City and the GPSD (including the portion of the its service area covering Bartonville and Bellevue) will experience future mine subsidence events is estimated to be ***medium*** while the probability that Peoria will experience future mine subsidence events is estimated to be ***low***. The remaining participating jurisdictions and much of the GPSD's service area is ***unlikely*** to experience future mine subsidence events. For the purposes of this analysis "unlikely" is defined as having a less than 2% chance of occurring in any given year, "low" is defined as having a less than a 10% chance of occurring in any given year and "medium" is defined as having up to a 50% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

Yes. Bartonville, Hanna City, Peoria and the GPSD are vulnerable to mine subsidence. According to ISGS, approximately 21,292 acres (5.5% of the land area) of Peoria County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 24,526 acres (4.8% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. A breakdown by municipality as not available. None of the other participating jurisdictions are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:
- Public Health & Safety – Zones 1 & 2: ***Low***
- Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

What impacts resulted from the recorded mine subsidence events?

While one confirmed mine subsidence claim was submitted to the Illinois Mine Subsidence Insurance Fund for Peoria County between 1999 and 2012, no information was available regarding the mine subsidence event that led to the claim. Since there is no available information on any *recorded* mine subsidence events in Peoria County (including the participating jurisdictions), there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- cracked, broken or damaged foundations
- cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- doors and windows stick, jam or break
- unlevel or tilted walls or floors
- doors swing open or closed
- chimney, porch or steps separate from the rest of the structure
- water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in the participating Peoria County jurisdictions is considered to be low for both Zones 1 and 2.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 5,213 housing units (6.7% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,768 housing units (4.8% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. A breakdown by municipality as not available.

According to an analysis conducted for the original Plan developed in 2004 and a review of the critical facilities and infrastructure identified by GPSD in 2020, there are nine critical facilities located in or near undermined areas in or adjacent to Bartonville. **Figure 214** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

Figure 214
Critical Facilities Located in or near Undermined Areas – Participating Peoria County Jurisdictions

Critical Facility Name	Critical Facility Type	Location
Bartonville Elementary School	School	Bartonville
Limestone Community High School	School	Bartonville
Oak Grove School	School	Bartonville
Holly Lane Station	Sewer Lift Station	Bartonville
Sutliff Road Station	Sewer Lift Station	Greater Peoria Regional Airport
Jefferson Street Station	Sewer Lift Station	Bartonville
Smithville Road Station	Sewer Lift Station	Bartonville
Rutledge Avenue Station	Sewer Lift Station	Bartonville
Paramount Road Station	Sewer Lift Station	Bartonville

The GPSD's sewer collection system is vulnerable to mine subsidence, especially in the Bartonville and Bellevue areas. While discussions with the GPSD indicate that the District has not experienced any adverse impacts associated with mine subsidence, an inventory of the sewer collection system lines vulnerable to mine subsidence within the District's service area is not currently available. As a result, a data deficiency exists for the GPSD in terms of comprehensively identifying the risk to its infrastructure from mine subsidence.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in participating Peoria County jurisdictions is considered to be medium for Zone 1 and low for Zone 2 and all other areas.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those buildings, critical facilities and infrastructure that reside in Zones 1 and 2 have the potential to experience future dollar losses from mine subsidence.

3.10 DAM FAILURES

HAZARD IDENTIFICATION

What is the definition of a dam?

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir.

According to the U.S. Army Corps of Engineers' National Inventory of Dams (NID), there are approximately 90,580 dams in the United States and Puerto Rico, with 1,607 dams located in Illinois. (The NID is maintained by the U.S. Army Corps of Engineers and is updated approximately every two years.) Of the 1,607 dams in Illinois, approximately 92% are constructed of earth.

What is the definition of a dam failure?

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. In the event of a dam failure, the people, property and infrastructure downstream could be subject to devastating damages. The potential severity of a full or partial dam failure is influenced by two factors:

- the capacity of the reservoir and
- the density, type and value of development/infrastructure located downstream.

There are two categories of dam failures, "flood" or "rainy day" failures and "sunny day" failures. A "flood" or "rainy day" failure usually results when excess precipitation and runoff cause overtopping or a buildup of pressure behind a dam which leads to a breach. Even normal storm events can lead to "flood" failures if debris plugs the water outlets. Given the conditions that lead to a "flood" failure (i.e., rainfall over a period of hours or days), there is usually a sufficient amount of time to warn and evacuate residents downstream.

Unlike a "flood" failure, there is generally no warning associated with a "sunny day" failure. A "sunny day" failure is usually the result of improper or poor dam maintenance, internal erosion, vandalism or an earthquake. This unexpected failure can be catastrophic because it may not allow enough time to warn and evacuate residents downstream.

No one knows precisely how many dam failures have occurred in the United States; however, it's estimated that hundreds have taken place over the last century. Some of the worst failures have caused catastrophic property and environmental damage and have taken hundreds of lives. The worst dam failure in the last 50 years occurred on February 26, 1972 in Buffalo Creek, West Virginia. A tailings dam owned by the Buffalo Mining Company failed, taking 125 lives, injuring 1,000 individuals, destroying 507 homes and causing property damage in excess of $50 million (approximately $298.6 million in 2017 based on the Bureau of Labor Statistics Consumer Price Index Inflation Calculator.)

Dam failures have been documented in every state, including Illinois. According to the Dam Incident Database compiled by the National Performance of Dams Program, there have been 10 reported dam failures with uncontrolled releases of the reservoir in Illinois since 1950.

What causes a dam failure?

Dam failures can result from one or more of the following:

- ***prolonged periods of rainfall and flooding*** (the cause of most failures);
- ***inadequate spillway capacity*** resulting in excess flow overtopping the dam;
- ***internal erosion*** caused by embankment or foundation leakage;
- ***improper maintenance*** (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.);
- ***improper design*** (including use of improper construction materials and practices);
- ***negligent operation*** (including failure to remove or open gates or valves during high flow periods);
- ***failure of an upstream dam on the same waterway***;
- ***landslides into reservoirs*** which cause surges that result in overtopping of the dam;
- ***high winds*** which can cause significant wave action and result in substantial erosion; and
- ***earthquakes*** which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

How are dams classified?

The U.S. Army Corps of Engineers assigns each dam listed on the National Inventory of Dams a hazard potential classification rating per the "Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams." The classification system is based on the potential for loss of life and damage to property in the event of a dam failure. There are three classifications: High, Significant and Low. **Figure 215** provides a brief description of each hazard potential classification. It is important to note that the hazard potential classification assigned is not an indicator of the adequacy of the dam or its physical integrity and in no way reflects the current condition of the dam.

Figure 215
Dam Hazard Classification System

Hazard Potential Classification	Description
High	Those dams where failure or mis-operation result in probable loss of human life, regardless of the magnitude of other losses. The probable loss of human life is defined to signify one or more lives lost.
Significant	Those dams where failure or mis-operation result in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.
Low	Those dams where failure or mis-operation results in no probable loss of human life and low economic and/or or environmental losses. Losses are principally limited to the dam owner's property.

Sources: Federal Emergency Management Agency
U.S. Army Corps of Engineers

3.10.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There is one publicly-owned classified dam within the County owned by the City of Washington. The School Street Detention Basin Dam, an earthen dam located on a tributary of Farm Creek, was completed in 1996. It has a hazard classification of "Significant" and its purpose is flood control.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the County: ***40***

Number of Classified Dams owned by Participating Jurisdictions: ***1***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Are there any other publicly-owned classified dams within the County?

Yes. There are three other publicly-owned classified dam within the County, all owned by the U.S. Army Corps of Engineers.

Figure 216 provides detailed information on each of the four publicly-owned classified dams located in Tazewell County.

Are there any privately-owned classified dams within the County?

Yes. There are 36 privately-owned classified dams within Tazewell County. Twelve of the dams have a hazard classification of "High" or "Significant". Of the remaining 24 privately-owned classified dams, 22 have a hazard classification of "Low" and the remaining two are classified as "Unknown".

Of the 36 privately-owned classified dams in Tazewell County:

- 15 are owned by individuals;
- 8 are owned by homeowner/lake associations;
- 5 are owned by sportsmen clubs;
- 3 are owned by golf clubs;
- 2 are owned by businesses;
- 1 is owned by power plant; and
- 2 do not identify an owner.

Figure 217 provides detailed information on each of the twelve privately-owned classified dams with a hazard classification of "High" or "Significant" located in Tazewell County.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in Tazewell County.

Figure 216
Publicly-Owned Classified Dams Located in Tazewell County

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Farmdale	High	Farm Creek	USACE	Gravity Earth	Flood Control	1951	90 ft.	1,275 ft.	15,500 ac.-ft.	n/a	26 sq. mi.	Yes
Fondulac	High	Fondulac Creek	USACE	Gravity Earth	Flood Control	1949	74 ft.	1,000 ft.	18,100 ac.-ft.	n/a	5 sq. mi.	Yes
Peoria Lock & Dam	Significant	Illinois River	USACE	Concrete	Navigation	1939	23 ft.	536 ft.	225,000 ac.-ft.	n/a	14,544 sq. mi.	Yes
School Street Detention Basin Dam	Significant	Tributary Farm Creek	Washington	Earth	Flood Control	1996	12 ft.	330 ft.	8.0 ac.-ft.	n/a	0.06 sq. m.	Yes

Sources: Stanford University, National Performance of Dams Program, NPDP Dams Database.
U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

Figure 217
Select Privately-Owned Classified Dams Located in Tazewell County
(Sheet 1 of 2)

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Sunset Hills Lake 1 Dam	High	Tributary Lost Creek	Golf Club Properties Inc.	Earth	Irrigation, Recreation	1964	42 ft.	420 ft.	106 ac.-ft.	4 ac.	0.1 sq. mi	Yes
Sunset Hills Lake 2 Dam	High	Tributary Lick Creek	n/a	Earth	Other, Water Supply	1964	35 ft.	565 ft.	266 ac.-ft.	17 ac.	0.7 sq. mi.	No
Bessler Lake Dam	Significant	Tributary Lick Creek	Individual	Earth	Recreation	1965	29 ft.	180 ft.	44 ac.-ft.	n/a	n/a	No
Birkey Lake Dam	Significant	Tributary Lick Creek	Individual	Earth	Recreation	1978	28 ft.	540 ft.	105 ac.-ft.	n/a	n/a	No

Figure 217
Select Privately-Owned Classified Dams Located in Tazewell County
(Sheet 2 of 2)

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Grand Oaks Lake Dam	Significant	Tributary Lick Creek	Northern Oaks Estates Homeowner Assoc.	Earth	Recreation	1978	22 ft.	285 ft.	52 ac.-ft.	5 ac.	0.5 sq. mi.	Yes
Heritage Lake Dam	Significant	Tributary Mackinaw River	Heritage Lake Assoc. Inc.	Earth	Recreation	1968	56 ft.	590 ft.	2425 ac.-ft.	78 ac.	1.9 sq. mi.	Yes
Pine Lakes Country Club North Pond Dam	Significant	Tributary Farm Creek	Pine Lakes Country Club	Earth	Other	1959	42 ft	270 ft.	66 ac.-ft.	n/a	n/a	No
Pine Lakes Country Club South Pond Dam	Significant	Tributary Farm Creek	Pine Lakes Country Club	Earth	Other	1958	27 ft.	255 ft.	41 ac.-ft.	n/a	n/a	No
Powerton Cooling Lake Dam	Significant	Illinois River	Midwest Generation	Earth	Other	1970	26 ft.	31,200 ft.	25,630 ac.-ft.	1440 ac.	2.3 sq. mi.	Yes
Sutton Pond Dam	Significant	Tributary Mackinaw River	Individual	Earth	Recreation	1965	27 ft.	226 ft.	104 ac.-ft.	6 ac.	0.5 sq. mi.	No
Vendo Grande Lake Dam	Significant	Tributary Mackinaw River	Vendo Lake Homeowners Assoc.	Earth	Recreation	1975	44 ft.	415 ft.	1178 ac.-ft.	n/a	n/a	No
Vendo Pequeno Lake Dam	Significant	Tributary Mackinaw River	Vendo Lake Homeowners Assoc	Earth	Recreation	1975	44 ft.	252 ft.	128 ac.-ft.	n/a	n/a	No

Sources: Stanford University, National Performance of Dams Program, NPDP Dams Database.
U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were not developed or were not required to be developed for eight of the sixteen dams. The EAPs for the remaining eight dams were not made available to the Tazewell County Emergency Management Agency. As a result, a data deficiency exists in terms of defining the extent or magnitude of future potential dam failures.

What locations are affected by dam failure?

Figure 218 shows the locations of ***select classified dams*** in Tazewell County. Dam failures have the potential to impact the following municipalities/unincorporated areas:

- East Peoria;
- extreme northern boundary of Morton at Wastewater Treatment Plant #3;
- Rolling Meadows subdivision in Washington;
- Sunset Hills subdivision in Pekin;
- Towne Oaks community west of Groveland;
- Northern Oaks Estate community west of Groveland;
- undeveloped land north-northwest of Pine Lakes Country Club south of Washington;
- agricultural land east of Pekin Country Club (east of Veterans Drive and north of Broadway Street);
- agricultural and undeveloped land south and west of Powerton Generating Station near Pekin;
- agricultural and undeveloped land north and west of Mackinaw;
- undeveloped land just west of Lake Windermere community (along East Lake Windermere Road); and
- agricultural and undeveloped land north of Venado Lake community approximately 3 ½ miles north-northeast of Delavan.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

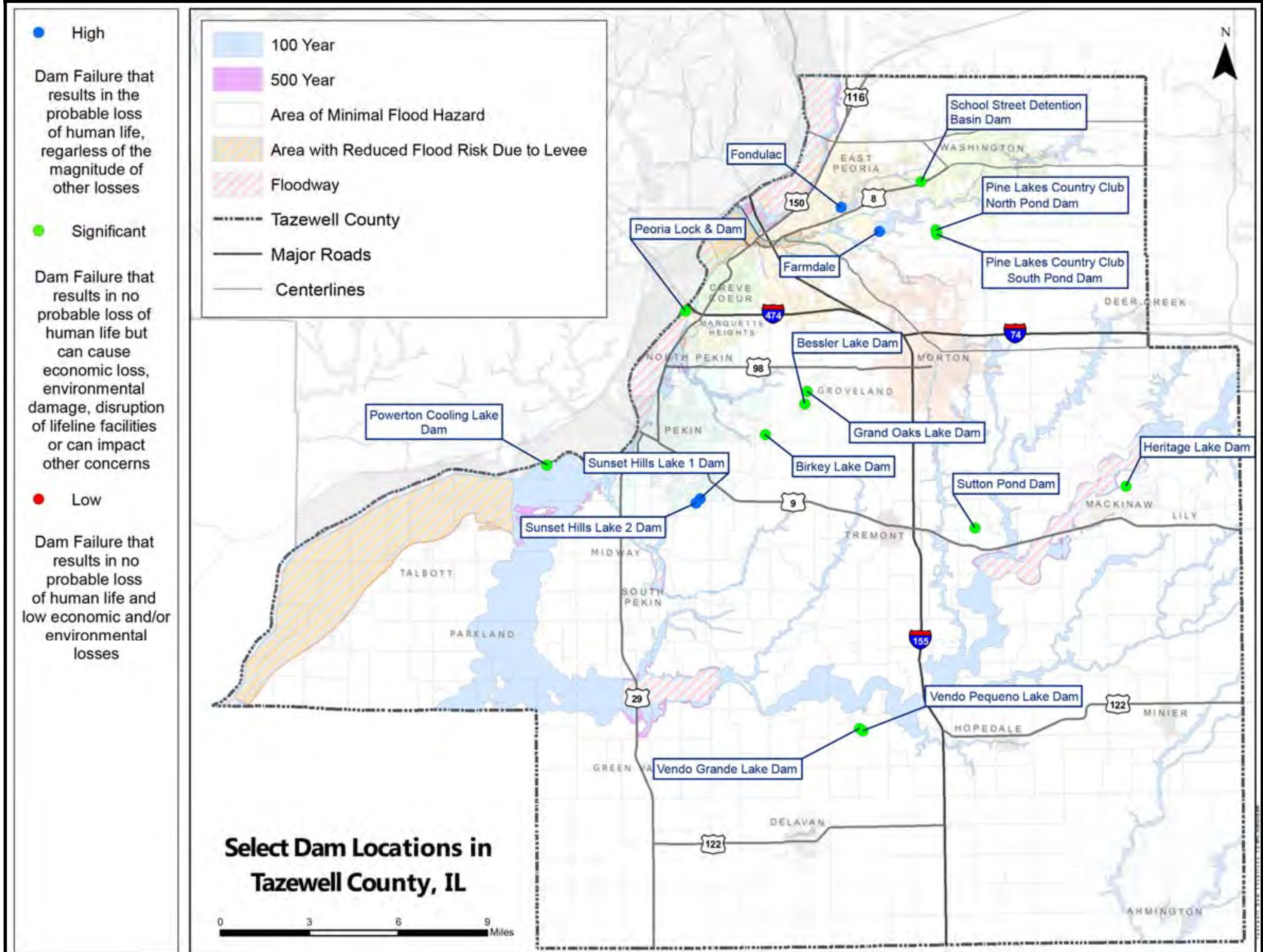
HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. East Peoria, Pekin, Washington, Morton and unincorporated areas of Tazewell County are vulnerable to the dangers presented by dam failures. None of the rest of the participating municipalities are considered vulnerable.

Figure 218a
Location of Select Classified Dams in Tazewell County



What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures in Tazewell County, there are no recorded impacts to report.

What other impacts can result from dam failures?

Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability to:

- Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Public Health & Safety: "Low" Hazard Classification & "Unknown" Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification & "Unknown" Dams – ***Low***

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure in Tazewell County is considered to be low for the "Low" hazard classification and "Unknown" dams and medium for the "High" and "Significant" hazard classification dams.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

As discussed previously, Emergency Action Plans (EAPs) detailing the existing buildings, infrastructure and critical facilities vulnerable to dam failures were not developed or were not required to be developed for eight of the sixteen dams. The EAPs for the remaining eight dams were not made available to the Tazewell County Emergency Management Agency. As a result, a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure and critical facilities vulnerable to dam failures. While EAPs were not available for the Farmdale and Fondulac Dams, the US Army Corps of Engineers did provide Dam Failure Inundation Maps (DFIMs) and preliminary estimates on the number of structures (residential and commercial) that have the potential to be impacted based on modeling.

While detailed information was not available for a majority of the dams, a visual inspection of the areas surrounding the classified dams indicates that there are buildings, infrastructure and critical facilities that are vulnerable to dam failures. **Figure 218b** provides a ***rough estimate*** of the buildings, infrastructure and critical facilities by dam vulnerable to a dam failure.

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the County are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Tazewell County is considered to be low for the “Low” hazard classification and “Unknown” dams and medium for the “High” and “Significant” hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Tazewell County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

Figure 218b Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County (Sheet 1 of 3)					
Dam Name	**Location**	**Number of Vulnerable Buildings/Infrastructure**			
		Residential	**Commercial**	**Infrastructure**	**Critical Facilities**
Publicly-Owned Classified Dams					
Farmdale	East Peoria	1,074*		- Toledo, Peoria, Western Railway - Tazewell & Peoria Railroad - Interstate 74 - US Route 24/Main St. - US Route 150/Meadow Ave. - Illinois Route 116 - Illinois Route 29 - Illinois Route 8/Washington St. - Farmdale Rd. - Camp St. - Tractor Rd. - Veterans Dr. - Bloomington Rd. - Camp Rd. - various residential streets	- Central Junior High School - East Peoria Community High School - East Peoria City Hall - James L. Ranney Public Safety Building (Police & Fire Central House) - East Peoria Fire Station 3 - East Peoria City Hall - Morton's Wastewater Treatment Plant #3 - East Peoria drinking water wells #8 & Catherine - Two power generation substations
Fondulac	East Peoria	1,113*		- Toledo, Peoria, Western Railway - Tazewell & Peoria Railroad - Interstate 74 - US Route 150/Meadow Ave. - Illinois Route 8/Washington St. - Veterans Dr. - Camp Rd. - various residential streets	- Central Junior High School - East Peoria Community High School - East Peoria Fire Station 3 - Oakwood Drinking Water Treatment Plant - East Peoria drinking water wells #8 & Catherine - One power generation substation

* Residential/commercial counts provided by the US Army Corps of Engineers and represent the worst case scenario (i.e., Maximum High Pool). The counts provided were describe as residential structures with commercial and industrial intermixed. A breakdown by structure type is not available.

Figure 218b **Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County** **(Sheet 2 of 3)**					
Dam Name	**Location**	**Number of Vulnerable Buildings/Infrastructure**			
		Residential	**Commercial**	**Infrastructure**	**Critical Facilities**
Publicly-Owned Classified Dams Continued…					
Peoria Lock & Dam	Creve Coeur	---	---	---	---
School Street Detention Basin Dam	Washington	1	---	- School Street	- Faith Lutheran Church
High & Significant Hazard Class Privately-Owned Classified Dams					
Sunset Hills Lake 1 Dam	Sunset Hills Subdivision (Pekin)	1-3	---	- Highwood Ave - North Lake Dr.	---
Sunset Hills Lake 2 Dam	Sunset Hills Subdivision (Pekin)	8-10	1	- Highwood Ave - Sierra Dr.	---
Bessler Lake Dam	Towne Oaks (Unincorp. Tazewell County)	---	---	- Bessler Lake Dr.	---
Birkey Lake Dam	0.5 miles west of Pekin Country Club (Unincorp. Tazewell County)	---	---	- Veterans Dr.	---
Grand Oaks Lake Dam	Groveland (Unincorp. Tazewell County)	1-3	---	- Locust Grove Rd.	---
Heritage Lake Dam	Mackinaw	2-6	1	- Heritage Dr. - Hild Rd. - Dee Mac Rd. - W. Fast Ave - N. Hoffman Ave.	---
Pine Lakes Country Club North Pond Dam	Pine Lakes Country Club (Unincorp. Tazewell County)	---	1	---	---
Pine Lakes Country Club South Pond Dam	Pine Lakes Country Club (Unincorp. Tazewell County)	---	1	---	---

Figure 218b Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County (Sheet 3 of 3)					
Dam Name	**Location**	**Number of Vulnerable Buildings/Infrastructure**			
		Residential	**Commercial**	**Infrastructure**	**Critical Facilities**
High & Significant Hazard Class Privately-Owned Classified Dams Continued…					
Powerton Cooling Lake Dam	Powerton Generating Station (Unincorp. Tazewell County)	4-5	3-4	- Manito Rd. - Wagonseller Rd. - Excel Way - Schumm Rd.	- NRG Powerton Generating Station
Sutton Pond Dam	0.5 mile west of Lake Windermere community (Unincorp. Tazewell County)	1-3	---	- E Lake Windemere Rd.	---
Vendo Grande Lake Dam	Venado Lake community (Unincorp. Tazewell County)	3-4	---	- Granada Dr. - Tullamore Rd.	---
Vendo Pequeno Lake Dam	Venado Lake community (Unincorp. Tazewell County)	2-3	---	- Granada Dr.	---

3.10.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There is one publicly-owned classified dam within the County owned by the City of Eureka. The Eureka Lake Dam, an earthen dam located on a tributary of Walnut Creek, was completed in 1942. It has a hazard classification of "Significant" and its purpose is as a water supply.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the County: ***10***

Number of Classified Dams owned by Participating Jurisdictions: ***1***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Are there any other publicly-owned classified dams within the County?

Yes. There is one other publicly-owned classified dam within the County owned by the City of Bloomington. (While Bloomington is located in McLean County, it owns property in Woodford County.) The Evergreen Lake Dam, an earthen dam located on Six Mile Creek, was completed in 1971. It has a hazard classification of "High" and its purpose is recreation and as a water supply.

Are there any privately-owned classified dams within the County?

Yes. There are eight privately-owned classified dams within Woodford County. Seven of the eight privately-owned classified dams have a hazard classification of "Low" and the remaining dam is classified as "Unknown".

Of these eight privately-owned classified dams:

- one is owned by an individual;
- four are owned by associations/leagues;
- one is owned by a business; and
- two do not identify an owner.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in Woodford County.

What locations are affected by dam failure?

Dam failures have the potential to impact Eureka, Germantown Hills and unincorporated areas of Woodford County. **Figure 219** shows the locations of ***select classified dams*** in Woodford County.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. Eureka, Germantown Hills and unincorporated areas of Woodford County are vulnerable to the dangers presented by dam failures. None of the rest of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures in Woodford County, there are no recorded impacts to report.

What other impacts can result from dam failures?

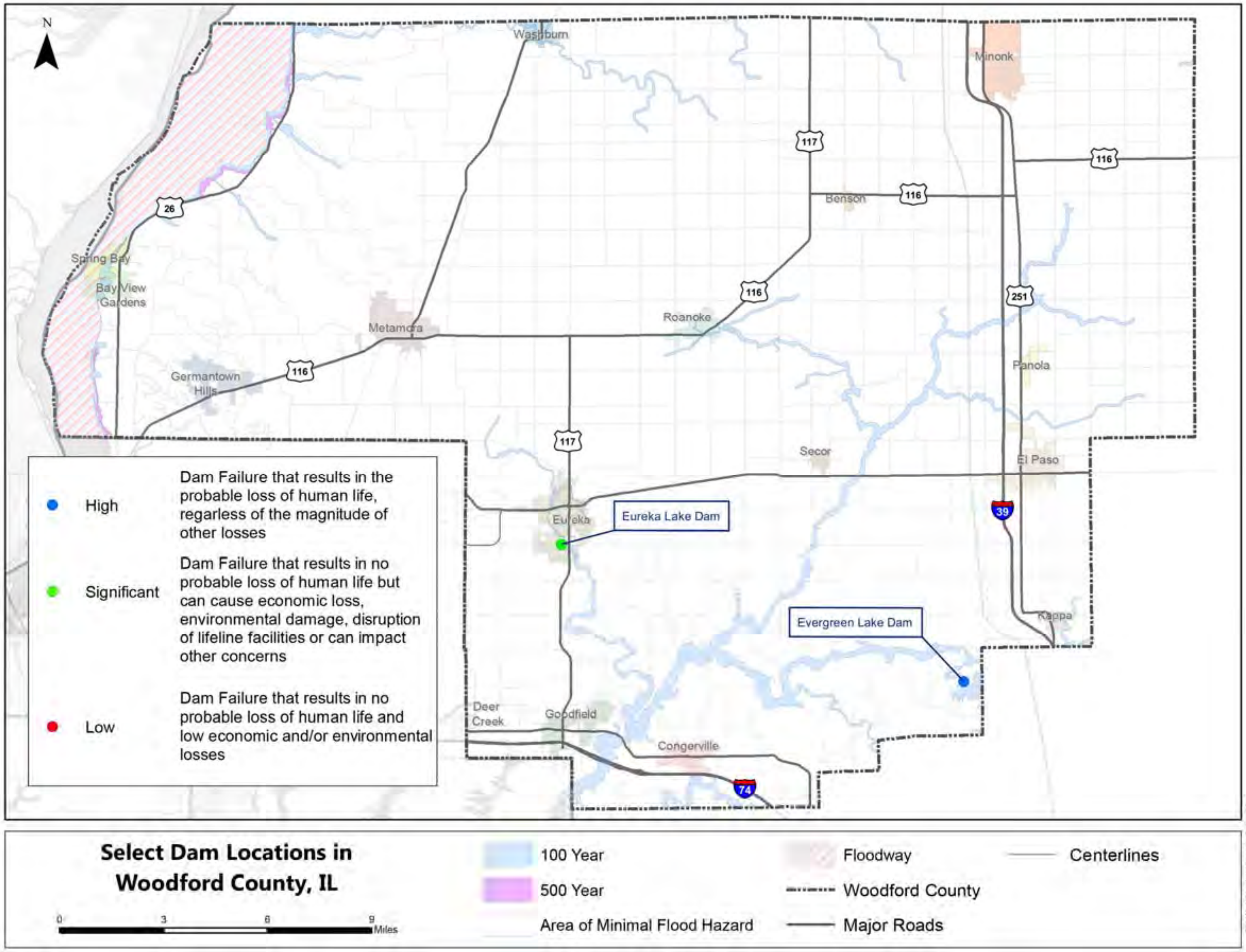
The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability to:

- Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Public Health & Safety: "Low" Hazard Classification & "Unknown" Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification & "Unknown" Dams – ***Low***

Figure 219
Location of Select Classified Dams in Woodford County



In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure in Woodford County is considered to be low for the “Low” hazard classification and “Unknown” dams and medium for the “High” and “Significant” hazard classification dams.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. While an Emergency Action Plan and inundation mapping was only available for the Evergreen Lake Dam, a visual inspection of the area surrounding the remaining nine classified dams indicates there are buildings and infrastructure that are vulnerable to dam failures.

The Tri-County Regional Planning Commission prepared inundation mapping based the Emergency Action Plan for Evergreen Lake Dam. This mapping identifies the number of residential structures, outbuildings and roadways that would be impacted by a dam failure based on two separate scenarios: the probable maximum flood (PMF) and sunny day. The PMF is a rainy-day failure scenario that refers to the flood magnitude that may be expected from the worst combination of meteorological and hydrologic conditions for a watershed. A sunny day failure, as discussed previously, results from a structural breach at a time when the reservoir is near normal pool level with less water entering the reservoir and therefore a smaller amount of water is being released at a lesser velocity than would occur during a PMF. **Figure 220** illustrates the area potentially affected by scenario while **Figure 221** provides a breakdown of the buildings and infrastructure vulnerable to a dam failure based on each scenario.

Figure 220
Evergreen Lake Dam Failure Inundation Map – Woodford County

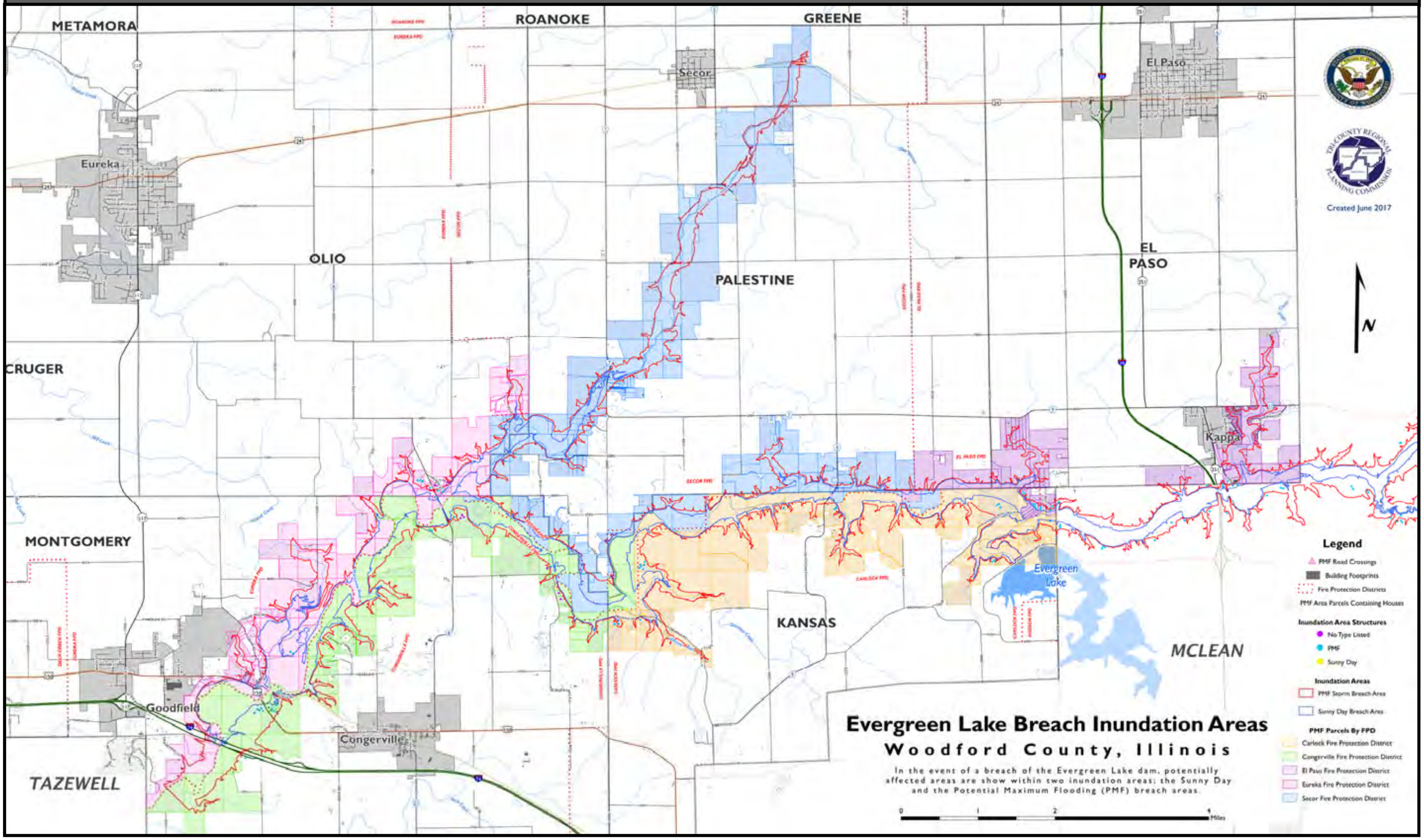


Figure 221 Evergreen Lake Dam – Buildings and Infrastructure Vulnerable to a Dam Failure in Woodford County				
Scenario	**Number of Impacted Buildings/Infrastructure**			**Residential Structures within 100 feet**
	Residential	**Garages/ Outbuildings**	**Highways/ Roadways**	
Probable Maximum Flood (PMF)	49	103	8	57
Sunny Day	2	3	0	0

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the County are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. According to the inundation mapping for the Evergreen Lake Dam, ***eight roadways, including Interstate 74 and US Route 150, would be overtopped by the PMF***.

Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Woodford County is considered to be low for the "Low" hazard classification and "Unknown" dams and medium for the "High" and "Significant" hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Woodford County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

3.10.3 PARTICIPATING PEORIA COUNTY JURISDICTIONS

HAZARD PROFILE

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There are two publicly-owned classified dam within the participating Peoria County jurisdictions, both owned or co-owned by the City of Peoria.

Are there any other publicly-owned classified dams within the participating Peoria County jurisdictions?

Yes. There are two other publicly-owned classified dams within the participating Peoria County jurisdictions, both are owned or co-owned by the Peoria Park District.

Figure 222 provides detailed information on each of the four publicly-owned classified dams located in in the participating Peoria County jurisdictions.

Are there any privately-owned classified dams within the participating Peoria County jurisdictions?

Yes. There are four privately-owned classified dams within the participating Peoria County jurisdictions. Two of the dams have a hazard classification of "High" or "Significant" and are located in Peoria. Both of the remaining privately-owned classified dams have a hazard classification of "Low" with one located in Peoria and the other located in Hanna City.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the Participating Municipalities: ***8***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Figure 223 provides detailed information on the privately-owned classified dams with a hazard classification of "High" or "Significant" located in the participating Peoria County jurisdictions.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in the participating Peoria County jurisdictions.

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were not developed or were not required to be developed for five of the six dams. The EAP for Franciscan Prairie Point Dam was not made available to the City of Peoria's Emergency Management Coordinator As a result, a data deficiency exists in terms of defining the extent or magnitude of future potential dam failures.

Figure 222
Publicly-Owned Classified Dams Located in the Participating Peoria County Jurisdictions

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Charter Oak North Lake Dam	Low	Tributary Kickapoo Creek	Peoria Park District	Earth	Recreation	1978	39 ft.	440 ft.	208 ac.-ft.	7 ac.	0.6 sq. mi.	No
Charter Oak South Lake Dam	Significant	Tributary Kickapoo Creek	Peoria Park District	Earth	Recreation	1970	33 ft.	303 ft.	43 ac.-ft.	n/a	n/a	No
Huntington Pointe Dam	Low	Tributary Kickapoo Creek	City of Peoria	Earth	Recreation	1993	34 ft.	250 ft.	16 ac.-ft.	3 ac.	0.2 sq. mi	No
Peoria City-County Landfill 2 Dam	Low	Tributary Warsaw Run	City of Peoria/ Peoria County	Earth	Other	n/a	22 ft.	n/a	51 ac.-ft.	11 ac.	n/a	No

Figure 223
Select Privately-Owned Classified Dams Located in the Participating Peoria County Jurisdictions

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Franciscan Prairie Pointe Dam	High	Fargo Run	OSF - Health Care System	Earth	Flood Control Other	n/a	10.7 ft.	340 ft.	166 ac.-ft.	13.2 ac.	1.91 sq. mi.	Yes
Lake Lynnhurst Dam	High	Tributary Kickapoo Creek	Lake Lynnhurst Owners Association	Earth	Recreation	1940	44 ft.	530 ft.	159 ac.-ft.	7 ac.	0.2 sq. mi.	No

What locations are affected by dam failure?

Figure 224 shows the locations of ***select classified dams*** in the participating Peoria County jurisdictions. Dam failures have the potential to impact the following jurisdictions:

- undeveloped area east and south of Huntington Point subdivision in Peoria;
- Charter Oak subdivision in Peoria;
- undeveloped area west of Franciscan Prairie Pointe in Peoria;
- Lynnhurst subdivision in Peoria; and
- Peoria City/County Landfill # 3 approximately 3 miles west-southwest of Edwards.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. Portions of Peoria and Hanna City are vulnerable to the dangers presented by dam failures. None of the rest of the participating Peoria County municipalities or the GPSD are considered vulnerable.

What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures in participating Peoria County jurisdictions, there are no recorded impacts to report.

Dam Failure Fast Facts – Risk

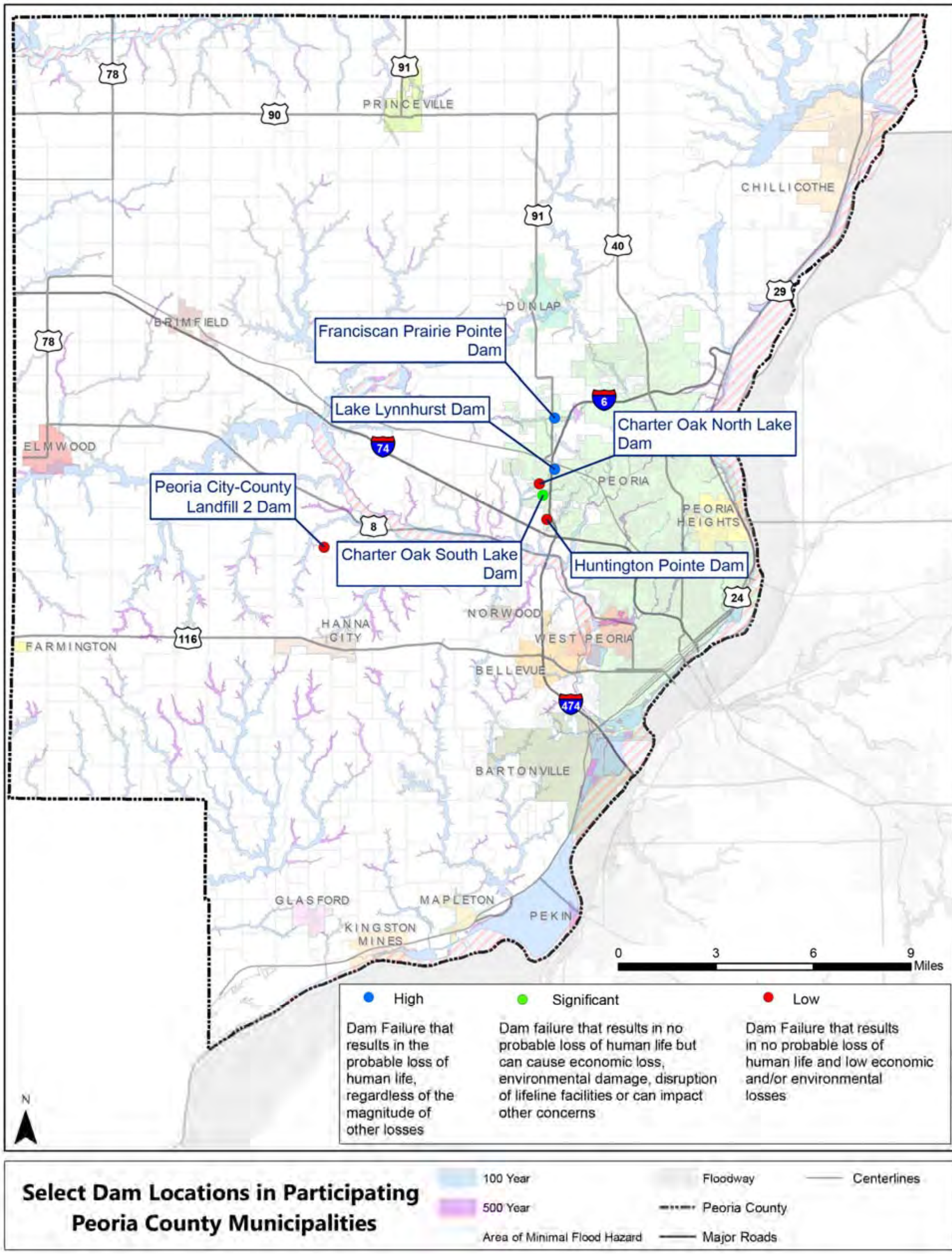
Dam Failure Risk/Vulnerability to:

- Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Public Health & Safety: "Low" Hazard Classification Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification Dams – ***Low***

What other impacts can result from dam failures?

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Figure 224
Location of Select Classified Dams in Participating Peoria County Jurisdictions



In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure is considered to be low for the "Low" hazard classification dams and medium for the "High" and "Significant" hazard classification dams located in Peoria and Hanna City.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

As discussed previously, Emergency Action Plans (EAPs) detailing the existing buildings, infrastructure and critical facilities vulnerable to dam failures were not developed or were not required to be developed for five of the six dams. The EAP for Franciscan Prairie Point Dam was not made available to the City of Peoria's Emergency Management Coordinator As a result, a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure and critical facilities vulnerable to dam failures.

While detailed information was not available for a majority of the dams, a visual inspection of the areas surrounding the classified dams indicates that there are buildings, infrastructure and critical facilities that are vulnerable to dam failures. **Figure 225** provides a ***rough estimate*** of the buildings, infrastructure and critical facilities by dam vulnerable to a dam failure.

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the participating jurisdictions are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

Figure 225
Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in the Participating Peoria County Jurisdictions

Dam Name	Location	Number of Vulnerable Buildings/Infrastructure			
		Residential	Commercial	Infrastructure	Critical Facilities
Huntington Pointe Dam	Huntington Pointe Subdivision (Peoria)	---	---	- North Rothmere Dr.	---
Peoria City-County Landfill 2 Dam	3 miles west-southwest of Edwards (Unincorp. Peoria County)	1-3	---	- West Cottonwood Rd.	---
Charter Oak South Lake Dam	Charter Oak Subdivision (Peoria)	1-2 apartment complexes	---	- Orange Prairie Rd. - Haymeadow Pl.	---
Charter Oak North Lake Dam	Charter Oak Subdivision (Peoria)	---	---	- Orange Prairie Rd. - Ancient Oak Dr.	---
Franciscan Prairie Pointe Dam	Franciscan Prairie Pointe (Peoria)	---	---	- Illinois Route 91	---
Lake Lynnhurst Dam	Lynnhurst Subdivision (Peoria)	---	---	- Illinois Route 6 - Charter Oak Park	---

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Peoria and Hanna City is considered to be low for the "Low" hazard classification dams and medium for the "High" and "Significant" hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Peoria, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

3.11 Levee Failures

Hazard Identification

What is the definition of a levee?

The U.S. Army Corps of Engineers (USACE or the Corps) defines a "levee" as an earthen embankment, floodwall or structure along a water course whose purpose is flood risk reduction or water conveyance while the National Flood Insurance Program defines a "levee" as a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding. Levees are typically not designed to hold back water for extended periods of time, rather they are meant to provide temporary flood protection from seasonal high water, precipitation and other weather events. While levees reduce the risk from a flooding event, they do not eliminate it. There is always the chance a flood will exceed the capacity of a levee, no matter how well it is built.

In Illinois, the Mississippi and Illinois River valleys were largely transformed from permanent, seasonal wetlands to highly productive agricultural lands by the construction of levees and the organization of drainage districts between 1879 and 1916.

What is the definition of a levee breach?

A levee breach is a rupture, break or gap in a levee which causes previously contained water to flood the land behind the levee. If the levee breach is identified as a "failure breach" then the cause of the breach is known and occurred without overtopping. In order for a breach to be termed a failure breach, an investigation is usually required to determine the cause.

What is the definition of overtopping?

Overtopping occurs when the water levels contained by the levee exceed the levee's crest elevation and flood the land behind the levee. The flooding occurs from overflow/overwash (waves) and other sources. In most cases overtopping may damage the levee but not compromise it. If the levee is compromised because of overtopping then it is identified as an "overtopping breach."

What causes a levee breach?

Levee breaches can result from one or more of the following:

- ***erosion of the crown and land-side face of the levee*** caused by overtopping (the higher the velocity of flow over the levee, the more quickly that erosion will occur and cause a failure of the levee);
- ***sand boils and piping*** resulting from the relatively fast passage of flood waters through permeable materials under the base of the levee to the land behind the levee (depending on the amount of sand and soil transported by the waters from the base to the surface, the levee may settle unevenly, crack or even completely fail);
- ***seepage and saturation*** (prolonged exposure to water will cause levee materials to become saturated, leading to seepage and sloughing of the soil on land-side face of the levee and resulting in the loss of slope stability and ultimately failure of the levee);

- ***erosion of the river-side slope of the levee*** as a result of wave action caused by wind and/or commercial or recreational vessels over a long period of time (most Illinois levees are constructed of sand and alluvial materials, both of which are among the easiest materials to erode);
- ***structural failures*** at gates, walls or closure structures;
- ***improper maintenance*** (including failure to maintain gates, walls or closure structures; remove trees; fill in holes created by burrowing animals, etc.); and
- ***earthquakes*** which can cause loss of soil strength and destabilize the levee and foundation materials.

Who is responsible for regulating levees?

This is no single agency with responsibility for levee oversight nationwide. The USACE has specific and limited authorities for approximately 2,000 levees across the country, totaling 14,000 miles. While the Corps serves as one of the nation's largest infrastructure stewards, the misperception exists that the USACE has universal responsibility for the nation's levees. There are three different classifications of levees:

- ***Federally Authorized Levees***. A levee typically designed and built by the Corps in cooperation with a local sponsor, then turned over to the local sponsor (i.e. drainage district) to operate, maintain, repair and replace the levee.
- ***Non-Federally Authorized Levees***. A levee designed and built by a non-federal agency, which is responsible for the operation, maintenance, repair and replacement of the levee.
- ***Private or Corporate-Owned Levees***. A levee designed and built by a private citizen, company or other public entity, which is responsible for the operation, maintenance, repair and replacement of the levee. The Corps has no responsibility for this type of levee.

3.11.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of levees of significance (those levees protecting a sizable amount of land, considerable number of structures and/or individuals); identifies past occurrences of levee failures associated with the levees of significance studied; details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences of levee failures.

Are there any levees of significance located in Tazewell County?

Yes. According to the USACE National Levee Database there are three levee systems of significance located in Tazewell County. **Figure 226** provides information on each levee system while **Figures 227, 228** and **229** illustrates their location and area protected.

Levee Breach Fast Facts – Occurrences

Number of Levee Systems of Significance Located in the County: ***3***

Number of Levee Breaches Reported: ***None***

Probability of Future Levee Breach Events: ***Low***

Figure 226
Levee Systems of Significance in Tazewell County

Levee System Name	Levee Category	Year Constructed	# of Levee Segments	Length of Levee (Miles)	Land Protected (Acres)	Inspection Rating	Year Inspected	PL 84-99 Status
East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek	Federally Authorized	1945	3	3.83	980	Minimally Acceptable	2017	Inactive
East Peoria Sanitary District (EPSD) RDB Farm Creek & Diversion Channel	Federally Authorized	1954	2	2.86	500	Unacceptable	2016	Inactive
Spring Lake Drainage & Levee District (D&LD)	Federally Authorized	1940	1	16.02	13,500	Minimally Acceptable	2017	Active

Source: US Army Corps of Engineers, National Levee Database.

When have levee breaches occurred previously? What is the extent of these previous levee breaches?

There have been *no recorded* levee breaches along any of the levees of significance studied in Tazewell County.

What locations are affected by levee breaches?

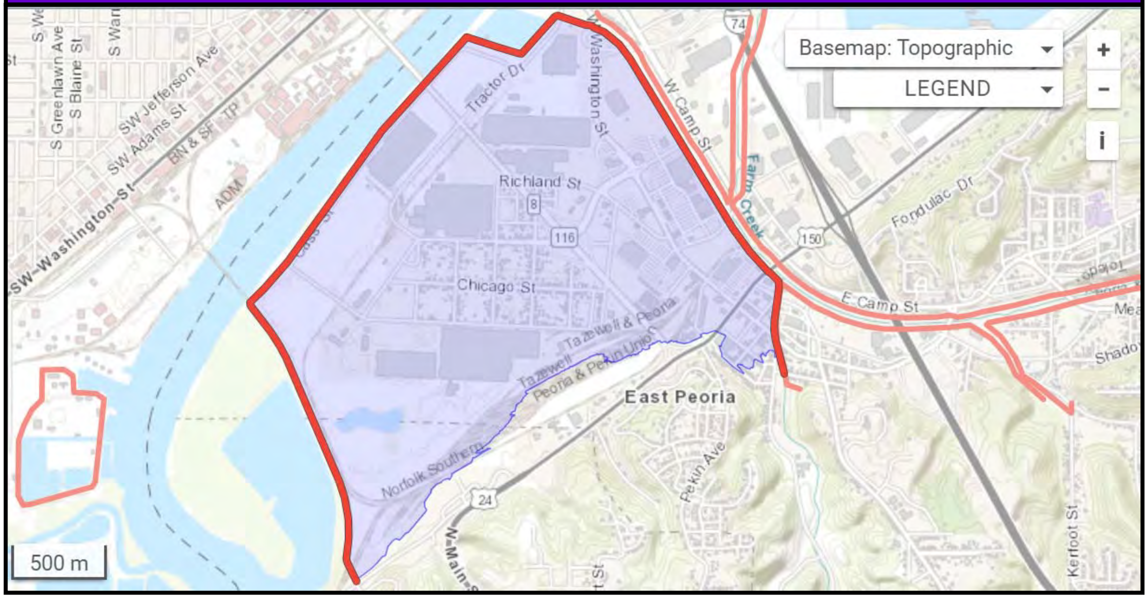
Levee breaches along the studied levees of significance have the potential to affect portions of East Peoria and unincorporated areas of Tazewell County.

What is the probability of future levee breach events occurring?

There are several factors that must be considered when calculating the probability of future levee breaches including whether a breach has occurred previously, the age and current conditions of the levee, whether proper maintenance is ongoing and the magnitude of the event. Since none of the levees of significance studied in Tazewell County have experienced a breach it is difficult to specifically establish the probability of future levee breaches associated with these levees; however, it is estimated to be relatively ***low***.

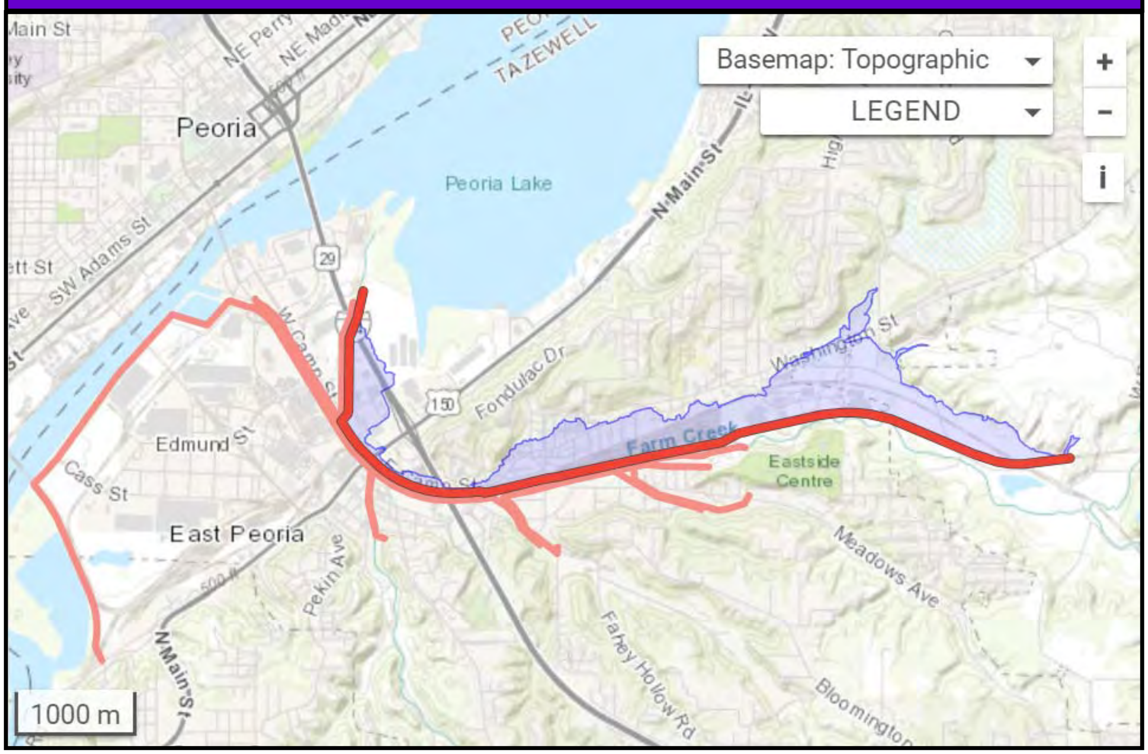
According to the USACE National Levee Database, the East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek system and the Spring Lake D&LD have Levee Safety Action Classifications of “Low.” The USACE’s Levee Safety Senior Oversight Group considers the risk associated with overtopping of the East Peoria D&LD to be low due to the moderate likelihood of overtopping with low associated consequences. The EPSD RDB Farm Creek & Diversion Channel system has not been screened for a Levee Safety Action Classification.

Figure 227
East Peoria Drainage & Levee District & East Peoria Sanitary District: LDB Farm Creek / Cole Creek Levee System



Source: US Army Corps of Engineers, National Levee Database.

Figure 228
East Peoria Sanitary District RDB Farm Creek & Diversion Channel Levee System



Source: US Army Corps of Engineers, National Levee Database.

Figure 229
Spring Lake Drainage & Levee District

Source: US Army Corps of Engineers, National Levee Database.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions associated with the levees of significance studied, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from levee failures.

Are the participating jurisdictions vulnerable to levee breaches?

Yes. Portions of East Peoria and unincorporated Tazewell County are vulnerable to the dangers presented by levee breaches associated with the studied levees. None of the rest of the County or participating municipalities are considered vulnerable.

What impacts resulted from the recorded levee breaches?

Since there have been no *recorded* levee breaches associated with the levees of significances studied in Tazewell County, there are no recorded impacts to report.

Levee Failure Fast Facts – Risk

Levee Breach Risk/Vulnerability to:

- Public Health & Safety: East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system – ***Low to Medium***
- Public Health & Safety: EPSD RDB Farm Creek & Diversion Channel levee system – ***Low to Medium***
- Public Health & Safety: Spring Lake D&LD – ***Low***
- Buildings/Infrastructure/Critical Facilities: East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: EPSD RDB Farm Creek & Diversion Channel levee system – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: Spring Lake D&LD – ***Low***

What other impacts can result from levee breaches?

Aside from causing damage to buildings, infrastructure and critical facilities, floodwaters released due to a levee breach also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew which can pose a health hazard, especially for small children, the elderly and those with specific allergies. Flooding also has the potential to contaminate drinking water sources used for both human and livestock consumption.

Flooding resulting from a levee breach can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during an event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

What is the level of vulnerability to public health and safety from levee breaches?

In terms of the risk or vulnerability to public health and safety from a levee breach associated with the studied levees, there are several factors that must be taken into consideration including the magnitude or severity of the precipitating event (whether an earthquake or flooding); the extent and type of development and infrastructure protected by the levee; the amount of time available to enact emergency measures such as evacuations; and USACE's Levee Safety Action Classification assessment. The following provides an evaluation of the risk to public health and safety by participating jurisdiction.

Unincorporated Tazewell County

According to the USACE's National Levee Database, there are only 271 people at risk in the Spring Lake D&LD levee system, the only levee of significance located in unincorporated Tazewell County. Given the amount of area protected (13,500 acres), there are relatively few individuals that have the potential to be impacted in the event of a levee breach. This fact, along with USACE's Levee Safety Action Classification assessment indicates the level of risk or vulnerability posed by a levee breach to public health and safety is low for the Spring Lake D&LD.

East Peoria

According to the USACE's National Levee Database, there are 4,205 people at risk in the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system and 1,860 people at risk in the EPSD RDB Farm Creek & Diversion Channel levee system, the only two levees of significance located within the City. The number of individuals potentially impacted was considered along with the USACE's Levee Safety Action Classification assessment in assessing the level or risk or vulnerability posed by a levee breach to public health and safety for both these levees.

In terms of the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system, the risk or vulnerability to public health and safety is considered to be low to medium. This is due in part to the USACE's Levee Safety Action Classification assessment and the number of potentially-impacted individuals. The USACE's Levee Safety Senior Oversight Group acknowledged that the large number of evacuees using the limited egress routes causes concern and there are a large number of transient shoppers from outside the leveed area that create a challenge to implement an evacuation plan.

In terms of the EPSD RDB Farm Creek & Diversion Channel levee system, the risk or vulnerability to public health and safety is also considered to be low to medium, in part due to the number of potentially-impacted individuals and the fact that the USACE has not assigned a Levee Safety Action Classification to this system.

Are existing buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Buildings, infrastructure and critical facilities located within the leveed area associated with the studied levees are vulnerable to levee breaches. **Figure 230** identifies the number of existing structures vulnerable to a levee breach by system, the estimated property value of the vulnerable structures and the participating jurisdiction the structures are located within. These counts were acquired from the USACE's National Levee Database.

Figure 230
Number of Existing Structures Vulnerable to a Levee Breach – Tazewell County

Levee System Name	Number of Vulnerable Structures	Estimated Property Value of Vulnerable Structures	Structure Location
East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek	422	$323 million	East Peoria
East Peoria Sanitary District (EPSD) RDB Farm Creek & Diversion Channel	267	$217 million	East Peoria
Spring Lake Drainage & Levee District (D&LD)	178	$42.5 million	Unincorporated Tazewell County

Source: US Army Corps of Engineers, National Levee Database.

Depending on the magnitude of the breach, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural and content damage may result. In addition to impacting structures, a levee breach can damage roads and utilities. Roadways, culverts and bridges can be weakened by levee breach floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to levee breach flooding. Depending on their location and the velocity of the water as it escapes the levee, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

Aside from key roads and power and communication lines, East Peoria has specific infrastructure/critical facilities that are vulnerable to the impacts of a levee breach from the studied levees. The following provides a description of each.

- City Hall, Central House fire station, the police department and wastewater treatment plant #1 are protected by the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system.
- The East Peoria Community High School is protected by EPSD RDB Farm Creek & Diversion Channel levee system.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the magnitude or severity of the precipitating event (whether an earthquake, general flood or flash flood), the extent and type of development and infrastructure protected by the levee, the amount of time available to implement emergency measures such as sandbagging and the USACE's Levee Safety Action Classification assessment. The following provides an evaluation of the risk to buildings, infrastructure and critical facilities by participating jurisdiction.

Unincorporated Tazewell County

Based on the number and type of structures at risk and the Levee Safety Action Classification assigned by USACE, the risk to existing buildings, infrastructure and critical facilities from a levee breach is considered to be low for the Spring Lake D&LD.

East Peoria

In terms of the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system, the risk or vulnerability to existing buildings, infrastructure and critical facilities is considered to be low to medium. This is due in part to the USACE's Levee Safety Action Classification assessment tempered by the number and type of at-risk structures. According to the USACE Risk Characterization Summary, the East Peoria D&LD was improved in 2009 and has been loaded up to 31% of the levee height with no performance issues. The Illinois River is slow rising and the D&LD closely monitors flood stages providing time for notifications and evacuation. The USACE's Levee Safety Senior Oversight Group did indicate in their assessment that there is some uncertainty about potential seepage under larger loadings related to animal burrows, the levee foundation that includes pervious fill materials along Wesley Slough, and long loading duration; however, a seepage analysis was completed as part of the 1996 Detailed Project Report and seepage beams were added where the minimum factor of safety was not present.

In terms of the EPSD RDB Farm Creek & Diversion Channel levee system, the risk to existing buildings, infrastructure and critical facilities is also considered to be low to medium, in part due to the number and type of at-risk structures and the fact that the USACE has not completed its risk characterization of this levee system.

Are future buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Any future buildings, infrastructure and critical facilities located within the studied levee systems are vulnerable to damage from a levee breach. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from levee breaches?

Unlike other hazards, there are no standard loss estimation models or methodologies for levee breaches. Given that there have been no recorded levee breaches associated with any of the levees of significance studied in Tazewell County, sufficient information is not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from a levee breach.

3.11.2 WOODFORD COUNTY

HAZARD PROFILE

According to the USACE National Levee Database there are only three small, privately-owned levees located within Woodford County. None of the levees protect a sizeable amount of land or a considerable number of structures or individuals.

Due to the limited impacts on the population, land use and infrastructure, levees are not analyzed in detail for Woodford County as part of this Plan update.

3.11.3 PARTICIPATING PEORIA COUNTY JURISDICTIONS

HAZARD PROFILE

The following details the location of levees of significance (those levees protecting a sizable amount of land, considerable number of structures and/or individuals); identifies past occurrences of levee failures associated with the levees of significance studied; details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences of levee failures.

Are there any levees of significance located in participating Peoria County jurisdictions?

Yes. According to the USACE National Levee Database there are two levee systems of significance located in Peoria, one of which is owned and maintained by the GPSD and protects the wastewater treatment facility from Illinois River flooding. **Figure 231** provides information on each levee system while **Figures 232** and **233** illustrates their location and area protected. No other levees of significance are located in the remaining participating Peoria County jurisdictions

Levee Breach Fast Facts – Occurrences

Number of Levee Systems of Significance Located in the Participating Municipalities: ***2***

Number of Levee Breaches Reported: ***None***

Probability of Future Levee Breach Events: ***Low***

When have levee breaches occurred previously? What is the extent of these previous levee breaches?

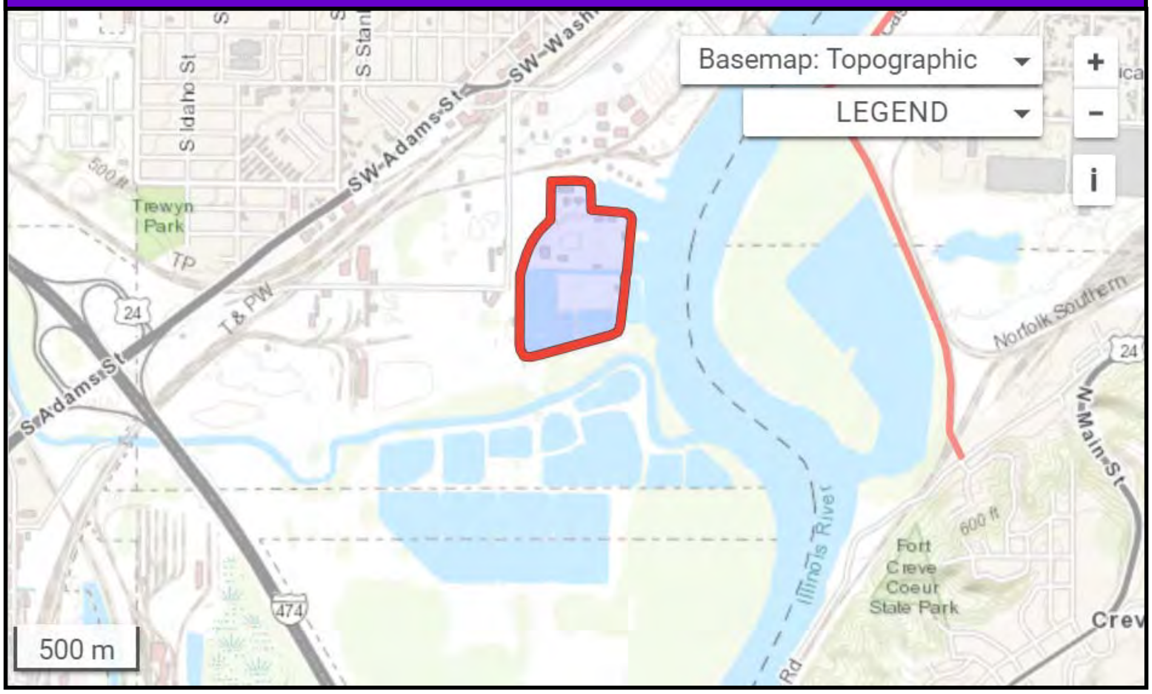
There have been *no recorded* levee breaches associated with the levees of significance studied in Peoria, including the GPSD Levee.

Figure 231
Levee Systems of Significance in the City of Peoria

Levee System Name	Levee Category	Year Constructed	# of Levee Segments	Length of Levee (Miles)	Land Protected (Acres)	Inspection Rating	Year Inspected	PL 84-99 Status
Greater Peoria Sanitary District (GPSD)	Private / Corporate-Owned	n/a	1	1.25	57	Minimally Acceptable	2017	Active
Komatsu Levee	Private / Corporate-Owned	n/a	1	0.82	n/a	n/a	n/a	n/a

Source: US Army Corps of Engineers, National Levee Database.

Figure 232
Greater Peoria Sanitary District Levee System



Source: US Army Corps of Engineers, National Levee Database.

What locations are affected by levee breaches?

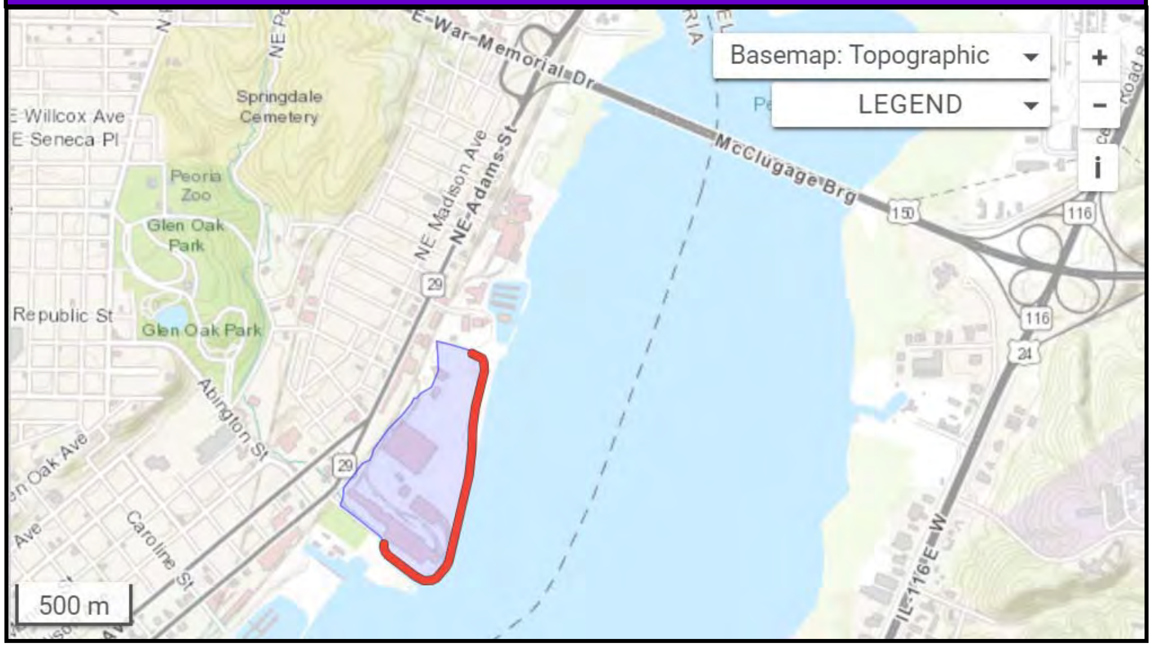
Levee breaches along the levees of significance studied have the potential to only affect portions of Peoria, including the GPSD wastewater treatment facility, along the Illinois River.

What is the probability of future levee breach events occurring?

There are several factors that must be considered when calculating the probability of future levee breaches including whether a breach has occurred previously, the age and current conditions of the levee, whether proper maintenance is ongoing and the magnitude of the event. Since none of the levees of significance studied in Peoria, including the GPSD levee system, have experienced a breach it is difficult to specifically establish the probability of future levee breaches associated with these levees; however, it is estimated to be relatively ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

According to the USACE National Levee Database, the GPSD has a Levee Safety Action Classification of low. The Komatsu Levee system has not been screened for a Levee Safety Action Classification.

Figure 233
Komatsu Levee System



Source: US Army Corps of Engineers, National Levee Database.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions associated with the levees of significance studied, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from levee failures.

Are the participating jurisdictions vulnerable to levee breaches?

Yes. Portions of Peoria, including the GPSD wastewater treatment facility, are vulnerable to the dangers presented by levee breaches associated with the studied levees. None of the rest of the participating Peoria County jurisdictions are considered vulnerable.

Levee Failure Fast Facts – Risk

Levee Breach Risk/Vulnerability to:

- Public Health & Safety: GPSD levee system – ***Low***
- Public Health & Safety: Komatsu Levee system – ***Low***
- Buildings/Infrastructure/Critical Facilities: GPSD levee system – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: Komatsu Levee system – ***Low to Medium***

Discussions with the GPSD's Director of Planning and Construction indicates that the District views flooding from a levee overtopping event at its main wastewater treatment facility as its greatest vulnerability. While the existing levee has withstood every flood event that has occurred to date, there is the potential that in coming years the levee will be insufficient to protect the facility. A major flood event of at least 30.6 feet would cause water to overtop the levee and incapacitate the wastewater treatment facility. The record setting Illinois River flood at Peoria crested at 29.32 feet on April 23, 2013 which is just 1.28 feet below the levee's overtopping point. Service disruptions from a levee overtopping event would lead to service disruptions for thousands of individuals as well as several major employers including two of the region's major healthcare organizations.

What impacts resulted from the recorded levee breaches?

Since there have been no *recorded* levee breaches associated with the levees of significances studied in the participating Peoria County jurisdictions, there are no recorded impacts to report.

What other impacts can result from levee breaches?

Aside from causing damage to buildings, infrastructure and critical facilities, floodwaters released due to a levee breach also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew which can pose a health hazard, especially for small children, the elderly and those with specific allergies. Flooding also has the potential to contaminate drinking water sources used for both human and livestock consumption.

Flooding resulting from a levee breach can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during an event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

What is the level of vulnerability to public health and safety from levee breaches?

In terms of the risk or vulnerability to public health and safety from a levee breach associated with the studied levees, there are several factors that must be taken into consideration including the magnitude or severity of the precipitating event (whether an earthquake or flooding); the extent and type of development and infrastructure protected by the levee; the amount of time available to enact emergency measures such as evacuations; and USACE's Levee Safety Action Classification assessment.

According to the USACE's National Levee Database, there are 70 people at risk in the GPSD levee system and 38 people at risk in the Komatsu Levee system. The number of individuals potentially impacted was considered along with the USACE's Levee Safety Action Classification assessment in assessing the level of risk or vulnerability posed by a levee breach to public health and safety for both levees.

In terms of the GPSD levee system, the risk or vulnerability to public health and safety is considered to be ***low***. This is due in part to the USACE's Levee Safety Action Classification assessment and the number of potentially-impacted individuals. The USACE's Levee Safety Senior Oversight Group in their Risk Characterization Summary indicated that given the flat leveed area and low workforce numbers, the workers would likely be able to evacuate before inundation depths would impede travel. The population at risk within the area is small with multiple egress routes a short distance away.

In terms of the Komatsu Levee system, the risk or vulnerability to public health and safety is also considered to be ***low***, in part due to the low number of potentially-impacted individuals and the numerous egress routes. At the time this Plan was updated, the USACE had not assigned a Levee Safety Action Classification nor conducted any risk characterization of this system.

Are existing buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Buildings, infrastructure and critical facilities located within the leveed areas are vulnerable to levee breaches. **Figure 234** identifies the number of existing structures vulnerable to a levee breach by system, the estimated property value of the vulnerable structures and the participating jurisdiction the structures are located within. These counts were acquired from the USACE's National Levee Database.

Figure 234
Number of Existing Structures Vulnerable to a Levee Breach – City of Peoria

Levee System Name	Number of Vulnerable Structures	Estimated Property Value of Vulnerable Structures	Structure Location
Greater Peoria Sanitary District (GPSD)	10	$120 million	Peoria
Komatsu Levee	2	$3.02 million	Peoria

Source: US Army Corps of Engineers, National Levee Database.

Depending on the magnitude of the breach, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural and content damage may result. In addition to impacting structures, a levee breach can damage roads and utilities. Roadways and culverts can be weakened by levee breach floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to levee breach flooding. Depending on their location and the velocity of the water as it escapes the levee, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

Aside from key roads and power and communication lines, Peoria and the GPSD have specific infrastructure/critical facilities that are vulnerable to the impacts of a levee breach from the studied levees. The following provides a description of each.

- The GPSD's wastewater treatment facility, which serves Peoria, Peoria Heights, Bartonville and several other communities, is protected by the GPSD levee system. This facility treats millions of gallons of wastewater daily and provides sanitary sewer service to approximately 49,000 customers. While the facility is protected by a levee, it is located in the base floodplain of the Illinois River and the levee is not currently certified or accredited by FEMA. The District conducted a flood hazard mitigation and levee certification study several years ago that made a number of key recommendations that have become part of a long-term plan to increase the resilience of the wastewater treatment facility. FEMA issued a Conditional Letter of Map Revision (CLOMR) to the GPSD in August 2015 based on the analysis, recommendations and plan for addressing known issues and meeting the factors of safety required for levee certification. The District is currently seeking funding to implement upgrades to the levee system that will allow the District to meet the certification and accreditation requirements and receive a Letter of Map Revisions (LOMR) from FEMA. These upgrades involve adding height to the existing levee to meet minimum freeboard requirements, seepage layers and interior drainage improvements for slope stability factors of safety, removeable flood barriers at the entrance drives and several flow control structures to regulate inflow and hydrostatic pressures in the soils around the facility.

- Komatsu America Corp.'s Mining Division headquarters and manufacturing facility are protected by the Komatsu Levee system. This facility is the "mother plant" for the manufacturing of electric-drive off-road dump trucks (up to 400-ton payload) used in mining applications around the world.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the magnitude or severity of the precipitating event (whether an earthquake, general flood or flash flood), the extent and type of development and infrastructure protected by the levee, the amount of time available to implement emergency measures such as sandbagging and the USACE's Levee Safety Action Classification assessment.

In terms of the GPSD levee system, the risk or vulnerability to existing buildings, infrastructure and critical facilities is considered to be ***low*** to ***medium***. This is due in part to the USACE's Levee Safety Action Classification assessment tempered by the type of critical facility at risk. According to the USACE Risk Characterization Summary, the levee system has experienced multiple significant loading events, with a history of good performance during the flood of record (60% loading). There is uncertainty in performance related to embankment seepage due to a portion of the levee embankment material consisting of landfill material (bricks, rocks, glass, and poor material quality); however, the remaining sections of the embankment and foundation consist of impervious material that is well compacted.

In terms of the Komatsu Levee system, the risk existing buildings, infrastructure and critical facilities is also considered to be ***low*** to ***medium***, in part due to the type of at-risk structures and the fact that the USACE has not completed its risk characterization of this levee system.

Are future buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Any future buildings, infrastructure and critical facilities located within the studied levee systems are vulnerable to damage from a levee breach. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from levee breaches?

Unlike other hazards, there are no standard loss estimation models or methodologies for levee breaches. With no recorded events listing property damage numbers for levee breaches, there is no way to reasonably estimate future potential dollar losses. However, according to the National Levee Database, the total estimated property value of vulnerable structures in the leveed areas is $123,020,000. Since all of the structures in the leveed areas are susceptible to levee breach impacts to varying degrees, this total represents the property exposure to levee breach events.

4.0 MITIGATION STRATEGY

4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce or eliminate the potential loss of life and property damage that results from the natural hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Reviewing and updating the mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in term of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural hazards.
- Evaluating the status of the existing mitigation actions and identifying a comprehensive range of jurisdiction-specific mitigation actions including those related to continued compliance with the National Flood Insurance Program (NFIP). Mitigation actions are projects, plans, activities or programs that achieve at least one of the mitigation goals identified.
- Analyzing the existing and new mitigation actions identified for each jurisdiction. This analysis ensures each action will reduce or eliminate future losses associated with the hazards identified in the Risk Assessment section.
- Reviewing and updating the mitigation actions prioritization methodology. The prioritization methodology outlines the approach used to prioritize the implementation of each identified mitigation action.
- Identifying the entity(s) responsible for implementing and administering. For each mitigation action, the entity(s) responsible for implementing and administering that action is identified as well as the timeframes for completing the actions and potential funding sources.
- Conducting a preliminary cost/benefit analysis of each mitigation action. The qualitative cost/benefit analysis provides participants a general idea which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

As part of the Plan update, the mitigation strategy was reviewed and revised. A detailed discussion of each aspect of the mitigation strategy and any updates that were made is provided below.

4.1 MITIGATION GOALS REVIEW

As part of the Plan update process, the mitigation goals identified in the 2010 Plan Update were reviewed and re-evaluated. The Mitigation Action Committee (MAC) decided to replace the overarching goal, the four updated mitigation goals and the extensive list of objectives and implementation strategies outlined in the 2010 Plan Update in order to simplify the mitigation strategy, streamline the implementation process and address a more comprehensive range of mitigation activities and projects. The core values of the mitigation goals identified in 2010 Plan Update were used to develop a set of eight broadly-defined mitigation goals.

The new updated list of mitigation goals was distributed to the MAC members at the first meeting on October 25, 2017. Members were asked to review the updated list before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the MAC's meeting on March 14, 2018 the group discussed the updated list of goals and approved them with no changes or additions. **Figure 235** lists the approved mitigation goals.

Figure 235
Mitigation Goals

Goal 1	Educate people about the natural hazards they face and the ways they can protect themselves, their homes, and their businesses from those hazards.
Goal 2	Protect the crops and lives, health, and safety of the people and animals in the County from the dangers of natural hazards.
Goal 3	Protect existing infrastructure and design new infrastructure (roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural hazards.
Goal 4	Incorporate natural hazard mitigation into community plans, regulations and activities.
Goal 5	Place a priority on protecting public services, including critical facilities, utilities, roads and schools.
Goal 6	Preserve and protect the rivers and floodplains in our County.
Goal 7	Ensure that new developments do not create new exposures to damage from natural hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural hazards.

4.2 EXISTING MITIGATION ACTIONS REVIEW

The Plan update process included a review and evaluation of the ***existing hazard mitigation actions*** listed in the 2010 Plan Update. A copy of these actions are included in **Appendix M**. A review of the existing hazard mitigation actions revealed the following shortcomings:

- ❖ Actions were not jurisdiction-specific. Many of the actions were applied to every participant no matter their level of interest, ability to implement or relevance to their jurisdiction.
- ❖ Actions did not identify specific entities responsible for implementation. In many cases the responsibility for implementing an action was assigned to a generic agency such as "local government". This created a situation in which the participating jurisdictions did not have a clear understanding of which department within their own jurisdiction was tasked with implementing the action and therefore felt no sense of responsibility or ownership of the action.
- ❖ Actions were applied to non-participating entities. A few of the actions covered entities (such as local school districts) that did not participate in the development of the 2010 Plan Update, and therefore should not have been assigned responsibility for implementation of mitigation actions.
- ❖ Actions were assigned to non-governmental entities. Several of the actions were specifically assigned to the Mitigation Advisory Committee (MAC), which does not have the legal authority to implement actions within any of the participating jurisdictions. In addition, there is no indication that the MAC met on a regular basis to work towards implementing any of their assigned actions. Aside from updating the Plan, the Tri-County Regional Planning Commission reported that to their knowledge no progress had been made on any of the MAC-assigned actions.

As a result of these findings, the MAC decided to eliminate any action that was: a) vague or too general/broad in scope and b) not assigned to a participating jurisdiction. In addition, those actions listed for wildfires were also eliminated as the MAC concluded that it was a minimal risk and chose not to include it in the Plan update. As a result, mitigation actions 4, 5, 8, 11, 14, 15 and 16 were removed.

The MAC then agreed to create individual, jurisdiction-specific mitigation action lists for each participating jurisdiction. The remaining mitigation actions included in the 2010 Plan Update were evaluated, assigned to the appropriate participating jurisdiction(s) and presented to the MAC members for their review and evaluation at the second meeting held on March 14, 2018. Each of the participating jurisdictions were asked to identify those actions that were either in progress or that had been completed since the 2010 Plan Update was adopted. They were also given the opportunity to eliminate any action on their specific list that they did not deem viable and/or practical for implementation by their jurisdiction.

Figure 236 through **245** located at the end of this section, summarize the results of this evaluation by participating jurisdiction. Each action listed includes a reference number to the 2010 Plan Update mitigation action list located in **Appendix M**. The following exceptions should be noted:

- Bartonville, Hanna City, Morton, Tremont, Eureka, Germantown Hills and the GPSD did not participate in the development of either the original Plan or the 2010 Plan Update and therefore are not included in the summary.
- While Peoria County participated in the 2010 Plan Update, it chose not to participate in this update process and therefore is not included in the summary. The County chose to prepare its own hazard mitigation plan for the unincorporated areas of the County in 2017.

While not specifically listed in the 2010 Plan Update, Washington has completed several additional mitigation-related projects and activities. The following identifies the action, the year it was completed and provides a brief description of the action.

Activity/Project Description	Completed	Summary of Activity/Project
1. Emergency backup generator installed at the Rolling Meadows lift station to provide uninterrupted power and maintain operations.	2017	125kW backup generator was added at this critical lift station serving a population of 1,500.
2. Emergency backup generator installed at Water Treatment Plant #1 to provide uninterrupted power and maintain operations.	2016	500kW backup generator was added at this water plant serving a population of 13,500.
3. Emergency backup generator installed at City Hall to provide uninterrupted power and maintain operations.	2016	50kW backup generator was added at City Hall to help insure continuation of services during hazard events.

Activity/Project Description	Completed	Summary of Activity/Project
4. Drainage enhancements undertaken at Diebel detention basin.	2017	Drainage upgrades were performed within the regional detention basin protecting portions of the City's east end.
5. East side Letter of Map Revision (LOMR) submitted for North Main Street to Diebel Road	2017	LOMR reduced the overall 100-year floodplain delineation for many properties along and near Farm Creek. Established modern base flood elevation data replacing data that was 30 years old.

4.3 New Mitigation Actions Identification

Given the shortcomings of the existing mitigation actions, it was essential that a comprehensive range of ***new, jurisdiction-specific mitigation actions*** be identified for each participating jurisdiction as part of the Plan update process. Instead of focusing on all-inclusive actions covering multiple jurisdictions, participants were asked to identify mitigation actions that met the specific needs and risks identified for their jurisdiction.

Representatives of the following jurisdictions were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program.

- ❖ Bartonville
- ❖ Chillicothe
- ❖ East Peoria
- ❖ Eureka
- ❖ Morton
- ❖ Pekin
- ❖ Peoria
- ❖ Peoria Heights
- ❖ Roanoke
- ❖ Tazewell County
- ❖ Tremont
- ❖ Washington
- ❖ Woodford County

The compiled lists of new mitigation actions were reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated.

4.4 Mitigation Actions Analysis

Next, the existing and new mitigation actions were then assigned to one of six broad mitigation activity categories which allowed Committee members to compare and consolidate similar actions. Projects and activities of similar scope were reworded and/or combined to eliminate repetition. **Figure 246** identifies each mitigation activity category and provides a brief description.

Each mitigation action was then analyzed to determine:

- ➢ the hazard or hazards being mitigated;
- ➢ the degree to which the impacts associated with a particular hazard(s) would be mitigated (i.e., reduced or eliminated);
- ➢ the general size of the population affected (i.e., small, medium or large);
- ➢ the goal or goals fulfilled;

- whether the action would reduce the effects on new or existing buildings and infrastructure; and
- whether the action would ensure continued compliance with the National Flood Insurance Program.

Figure 246
Types of Mitigation Activities

Category	Description
Regulatory Activities (RA)	Regulatory activities are designed to reduce a jurisdiction's vulnerability to specific hazard events. These activities are especially effective in hazard prone areas where development has yet to occur. Examples include: planning and zoning, floodplain regulations and local ordinances (i.e., building codes, etc.).
Structural Projects (SP)	Structural projects lessen the impact that a hazard has on a particular structure through design and engineering. Examples include: storm sewers, road and bridge projects, storm/tornado shelters, flood walls and seismic retrofits.
Public Information & Awareness (PI)	Public information and awareness activities are used to educate individuals about the potential hazards that affect their community and the mitigation strategies that they can take part in to protect themselves and their property. Examples include: outreach programs, school programs, brochures and handout materials, evacuation planning and drills, volunteer activities (i.e., culvert cleanout days, initiatives to check on the elderly/disabled during hazard events, etc.).
Studies (S)	Studies are used to identify activities that can be undertaken to reduce the impacts associated with certain hazards. Examples include: hydraulic and drainage studies.
Miscellaneous Projects (MP)	Miscellaneous projects is a catchall for those activities or projects that help to reduce or lessen the impact that a hazard may have on a critical facility or community service. Examples include: snow fences, generators, warning sirens, etc.
Property Protection (PP)	Property protection activities are designed to retrofit existing structures to withstand natural hazards or to remove structures from hazard prone areas. In Illinois, this category of activities primarily pertains to flood protection. Examples include: acquisition, relocation, elevation, insurance (i.e., flood, homeowners, etc.) and retrofitting (i.e., impact resistant windows, etc.).

4.5 MITIGATION ACTIONS PRIORITIZATION METHODOLOGY REVIEW

The methodology developed to prioritize mitigation actions in the 2010 Plan Update was reviewed by the MAC as part of this Plan update process. The prioritization methodology was based on the STAPLE+E planning factors (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) and applied a rating of high, moderate or low to each mitigation action. Taking into account the number and types of factors assessed and the complexity associated with the STAPLE+E analysis, the MAC decided to replace the prioritization methodology with one focused on just two key factors: 1) the frequency of the hazard and 2) the degree of mitigation attained. This updated prioritization methodology was presented to the MAC members at the third meeting held on June 20, 2018. The group reviewed and discussed the updated methodology and chose to approve it with no changes.

Figure 247 identifies and describes the four-tiered prioritization methodology adopted by the Committee. The methodology developed provides a means of objectively determining which actions have a greater likelihood of eliminating or reducing the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

While prioritizing the actions is useful and provides participants with additional information, it is important to keep in mind that implementing any the mitigation actions is desirable regardless of which prioritization category an action falls under.

Figure 247
Mitigation Action Prioritization Methodology

		Hazard	
		Most Significant Hazard **(M)** (i.e., severe storms, severe winter storms, floods, tornadoes)	Less Significant Hazard **(L)** (i.e., excessive heat, drought, landslides, earthquakes, dam failures, levee failures)
Mitigation Action	Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)**	**HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from the most significant hazards	**HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from less significant hazards
	Mitigation Action with the Potential to Reduce Impacts **(L)**	**LM** mitigation action has the potential to reduce damages, fatalities and/or injuries from the most significant hazards	**LL** mitigation action has the potential to reduce damages, fatalities and/or injuries from less significant hazards

4.6 Mitigation Actions Implementation, Administration & Cost/Benefit Analysis

Finally, each participating jurisdiction was asked to identify how the mitigation actions will be implemented and administered. This included:

- ❖ Identifying the party or parties responsible for oversight and administration.
- ❖ Determining what funding source(s) are available or will be pursued.
- ❖ Describing the time frame for completion.
- ❖ Conducting a preliminary cost/benefit analysis.

Oversight & Administration

It is important to keep in mind that some of the participating jurisdictions have limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. Four of the thirteen participating municipalities are small in size, with populations of less than 3,500 individuals while an additional four participating municipalities have populations of less than 6,500 individuals. In most cases these municipalities have minimal staff. Their organizational structure is such that most have very few offices and/or departments, generally limited to public works and water/sewer. Those in charge of the offices/departments often lack the technical expertise needed in many cases to individually oversee and administer the identified mitigation actions. As a result, many of the smaller municipalities identified the village board/city council as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints. Other participants felt that oversight and administration fall under the purview of the entity's governing body (board/council) and not individual departments.

Funding Sources

While the Tri-County Regional Planning Commission has the ability to provide grant writing services to the participating counties and municipalities, many of the participating jurisdictions do not have administrators with grant writing capabilities. Given the specific nature of the identified mitigation actions, assistance was needed in identifying possible funding sources. The consultant provided written information to the participants about FEMA and non-FEMA funding opportunities that have been used previously to finance mitigation actions. In addition, funding information was discussed with participants during planning committee meetings and in one-on-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person and application period among other key points. Specific grants from the following agencies were identified: United State Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued. However if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by most, if not all, of the participants due to their size, projected population growth and limited revenue streams. It is important to remember that the population for unincorporated Woodford County is approximately 15,000 individuals while the population for unincorporated Tazewell County is just over 25,700 individuals. Eight of the thirteen participating municipalities have populations of less than 6,500 individuals. Most of the jurisdictions work hard to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

Time Frame for Completion

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In many cases, however, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

Cost/Benefit Analysis

A preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It was repeatedly communicated to the Planning Committee members that when a grant application is submitted to IEMA/FEMA for a specific action, a detailed cost/benefit analysis will be required to receive funding.

4.7 Mitigation Strategy Results

Figures 248 through **264** located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by County by participating jurisdiction and include both existing and new actions.

Figure 236 **Tri-County Regional Planning Commission (MAC) – Status of Existing Mitigation Actions**					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)	✓				
Obtain official recognition of the Mitigation Advisory Committee by the Tri-County communities in order to help institutionalize and develop an ongoing mitigation program. (Action Number 4)	✓				
Universal Siren Protocol for Tri- County Area: Coordinate among all agencies to ensure rapid and comprehensive dissemination of necessary information and of response operations. (Action Number 5)	✓				
Update the 2010 Tri-County Regional Planning Commission Natural Hazards Mitigation Plan. (Action Number 8)		✓			
Partner with Parent Teacher Associations and local schools to develop an annual children's and teacher's educational program which focuses on teaching children and adults about hazard seasons, effects, and mitigation opportunities. (Action Number 11)	✓				
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

In terms of changes associated with mitigation actions in progress or completed, Tri-County has one administrative activity in progress and it is not expected to substantially change the vulnerability of hazard prone areas within the region.

Tazewell County

Figure 237
Sheet (1 of 2)
Tazewell County – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)		✓			
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)		✓		2017	Tazewell County has distributed weather radios and continue to do so as they become available. Tazewell County was designated a StormReady County by NWS in 2017.
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters. This includes determining safety of current shelters, long and short-term shelter needs and retro-fitting existing facilities. (Action Number 6)		✓			Working with American Red Cross and Salvation Army to designate locations.
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓		2017	Adopted updated floodplain ordinance in 2017.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Tazewell County has several projects and administrative activities completed or in progress that have the potential to decrease the vulnerability of hazard prone areas, especially for flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects.

Tazewell County

Figure 237
Sheet (2 of 2)
Tazewell County – Status of Existing Mitigation Actions

Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			Community Development and EMA working with Tri-County Regional Planning Commission's GIS Department on this project
Utilize the news media and schools for public information promulgation about seismic risks. (Action Number 18)		✓			Participate in "Shake Out" each year and distribute information to Tazewell County superintendent

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Tazewell County has several projects and administrative activities completed or in progress that have the potential to decrease the vulnerability of hazard prone areas, especially for flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects.

Tazewell County

Figure 238
(Sheet 1 of 2)
East Peoria – Status of Existing Mitigation Actions

Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and Label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2017	Adopted updated floodplain ordinance in 2017.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

Between 2012 and 2017 sixteen commercial development projects, seven of them multi-tenant, the East Peoria City Hall and the East Peoria Library/Civic Plaza were constructed in the Levee District of East Peoria. These structures are protected from the 1% annual chance flood (100-year flood) by a provisionally-accredited levee. While the levee reduces the risk of flooding, it cannot eliminate all flood risk. The USACE's Levee Safety Senior Oversight Group considers the risk associated with this levee to be low. These changes in development have the potential to increase the City's vulnerability to flooding along the riverfront if a flood overtops or breaches the levee allowing floodwaters to inundate the protected areas behind. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, East Peoria has one administrative activity completed and this action has the potential to decrease the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 238
(Sheet 2 of 2)
East Peoria – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

Between 2012 and 2017 sixteen commercial development projects, seven of them multi-tenant, the East Peoria City Hall and the East Peoria Library/Civic Plaza were constructed in the Levee District of East Peoria. These structures are protected from the 1% annual chance flood (100-year flood) by a provisionally-accredited levee. While the levee reduces the risk of flooding, it cannot eliminate all flood risk. The USACE's Levee Safety Senior Oversight Group considers the risk associated with this levee to be low. These changes in development have the potential to increase the City's vulnerability to flooding along the riverfront if a flood overtops or breaches the levee allowing floodwaters to inundate the protected areas behind. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, East Peoria has one administrative activity completed and this action has the potential to decrease the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 239
(Sheet 1 of 2)
Pekin – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)			✓	2018	Received online access to all the hydrants owned by Illinois American Water Company within the corporate boundaries of the City.
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Pekin has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 239
(Sheet 2 of 2)
Pekin – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Pekin has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 240 (Sheet 1 of 2) Washington – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2016	Floodplain ordinance was amended to comply with changes to the model ordinance
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Washington has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 240 (Sheet 2 of 2) Washington – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			While this is largely in place, mapping needs to be continually updated to reflect new development and enhancements to our infrastructure network.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Washington has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Woodford County

Figure 241
Sheet (1 of 2)
Woodford County – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)			✓	2016	Twelve repetitive loss properties were purchased and the homes removed. Deed restrictions prevent sail or building
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)			✓	2015	Woodford County EMA distributed NOAA weather radios to the schools and nursing homes throughout the County who needed them. Woodford County EMA became a Storm Ready County in 2015.
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters. This includes determining safety of current shelters, long and short-term shelter needs and retro-fitting existing facilities. (Action Number 6)		✓			Woodford County has been working with the Red Cross, churches and community buildings to designate them as warming and emergency shelters.
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Woodford County has decreased the vulnerability of the hazard prone areas along floodways in the County by completing buyouts of 12 homes between 2013 and 2015. The County has several other projects and activities in progress or completed and these activities will not significantly change the vulnerability of hazard prone areas within the County.

Woodford County

Figure 241 Sheet (2 of 2) Woodford County – Status of Existing Mitigation Actions					
Activity/Project Description	**Status: No Progress (✓)**	**Status: In Progress (✓)**	**Status: Completed (✓)**	**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
Develop “hazard information centers” on the Tri-County communities’ websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			Woodford County is currently working with the Tri-County Regional Planning Commission on mapping hazardous facilities in the County.
Utilize the news media and schools for public information promulgation about seismic risks. (Action Number 18)	✓				

(Action Number “No.”) refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County’s vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Woodford County has decreased the vulnerability of the hazard prone areas along floodways in the County by completing buyouts of 12 homes between 2013 and 2015. The County has several other projects and activities in progress or completed and these activities will not significantly change the vulnerability of hazard prone areas within the County.

Woodford County

Figure 242
(Sheet 1 of 2)
Roanoke – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)		✓			
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2016	Adopted updated floodplain ordinance in July, 2016.
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Roanoke has one project and two administrative activities in progress or completed that have the potential to decrease the vulnerability of hazard prone areas within the Village.

Woodford County

Figure 242 (Sheet 2 of 2) Roanoke – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Roanoke has one project and two administrative activities in progress or completed that have the potential to decrease the vulnerability of hazard prone areas within the Village.

Participating Peoria County Jurisdictions

Figure 243
(Sheet 1 of 2)
Chillicothe – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chillicothe has several projects and activities that have potential to decrease the vulnerability of the hazard prone areas within the City. It's still too early to tell the degree of reduction that will be experienced from the implementation of these actions.

Participating Peoria County Jurisdictions

Figure 243
(Sheet 2 of 2)
Chillicothe – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chillicothe has several projects and activities that have potential to decrease the vulnerability of the hazard prone areas within the City. It's still too early to tell the degree of reduction that will be experienced from the implementation of these actions.

Participating Peoria County Jurisdictions

Figure 244
(Sheet 1 of 2)
Peoria – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)		✓			
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

The Riverfront Village Platform and parking deck, which housed three restaurants and 200 parking spaces and was located in the floodplain of the Illinois River, were demolished in 2017 and replaced with green space. This change in development decreased the City's vulnerability to flooding along the riverfront. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria has several activities in progress and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Participating Peoria County Jurisdictions

Figure 244 (Sheet 2 of 2) Peoria – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Develop “hazard information centers” on the Tri-County communities’ websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number “No.”) refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

The Riverfront Village Platform and parking deck, which housed three restaurants and 200 parking spaces and was located in the floodplain of the Illinois River, were demolished in 2017 and replaced with green space. This change in development decreased the City’s vulnerability to flooding along the riverfront. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City’s vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria has several activities in progress and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Participating Peoria County Jurisdictions

Figure 245
(Sheet 1 of 2)
Peoria Heights – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)	✓				
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria Heights has one activity in progress and that activity will not significantly change the vulnerability of hazard prone areas within the Village.

Participating Peoria County Jurisdictions

Figure 245
(Sheet 2 of 2)
Peoria Heights – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria Heights has one activity in progress and that activity will not significantly change the vulnerability of hazard prone areas within the Village.

Figure 248
(Sheet 1 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify areas where erosion is or will occur (such as steep slopes & stream banks) and incorporate/construct erosion-focused best management practices (BMPs) where possible.	F, L, SS, SWS	MP	Reduces	Small	2, 3, 4, 5, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/Medium	New
LM	Identify areas where flooding is or will occur (such as non-permeable surfaces) and incorporate/construct stormwater management-focused best management practices (BMPs) where possible.	F, SS, SWS	MP	Reduces	Small	2, 3, 4, 5, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Medium/Medium	New
LM	Educate Tri-County area residents about the benefits of stormwater management practices in their communities and on their personal property.	F, SS	PI	Reduces	Medium	1, 2	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/Medium	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to alleviate recurring drainage problems within the region.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Planning Commission	2 - 4 years	IDOT Local Roads	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 2 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Select, design and construct the appropriate remedy(s) to alleviate recurring drainage problems within the region.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	3 - 5 years	IDOT Local Roads	High/High	New
HM	Reshape/regrade select high impact drainage areas in the region to increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	2 - 5 years	Planning Commission/ Municipalities & Counties	Medium/High	New
HM	Remove debris, vegetative overgrowth and/or brush from streams and creeks within the region to maintain/increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/High	New
HM	Remove debris, sediment and obstructions from ditches, culverts and bridges and implement best management practices (BMPs) to maximize carrying capacity, better manage stormwater runoff and reduce/prevent drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 3 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Construct upstream detention basins, channelize/reshape tributaries and extend storm sewer lines to better manage stormwater runoff, increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	3 - 5 years	FEMA Flood Mitigation Assistance	High/High	New
LM	Educate landowners on the importance of implementing stormwater management-related best management practices (BMPs) to reduce nutrient loss and topsoil from agricultural fields and urbanized areas.	F, SS	PI	Reduces	Medium	1, 2, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Counties	Low/Medium	New
LM	Conduct watershed studies to identify potential flood mitigation activities and determine best management practices (BMPs).	F, SS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	IEPA Section 319(h)	Low/Medium	New
LL	Conduct a study to identify, evaluate and/or implement potential measures to reduce the impacts of drought on the region's water supply.	DR	S	Reduces	Large	2, 3, 5	Yes	Yes	Planning Commission	2 - 4 years	Planning Commission	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 4 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.	F	PP	Reduces	Small	2, 6	n/a	Yes	Planning Commission	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Obtain official recognition of the Mitigation Advisory Committee by the Tri-County communities in order to institutionalize and develop an ongoing mitigation program.	DF, DR, EH, EQ, F, L, MS, SS, SWS, T	MP	Reduces	Large	2, 4	Yes	Yes	Planning Commission	1 - 2 years	Planning Commission	Low/Medium	Existing (2010)
LM	*Universal siren protocol for Tri-County area*: Coordinate among all agencies to ensure rapid and comprehensive dissemination of necessary information and of response operations.	SS, T	MP	Reduces	Large	2, 3, 4, 5	Yes	Yes	Planning Commission	2 - 4 years	Planning Commission	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 5 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Contact NRCS regarding opportunities for technical and financial assistance for drought preparedness and response.	DR	MP	Reduces	Medium	2, 3, 5	n/a	Yes	Planning Commission	3 - 5 years	Planning Commission	Low/Medium	Existing (2010)
LM	Partner with Parent Teacher Associations and local schools to develop an annual children's and teacher's educational program which focuses on teaching children and adults about hazard seasons, effects, and mitigation opportunities.	EH, EQ, F, L, MS, SS, SWS, T	PI	Reduces	Medium	1, 2	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Local Schools	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249
(Sheet 1 of 4)
Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Community Development													
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department/ County Board	1 - 5 years	County	Low/High	New
LM	Continue to make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department	1 year	County	Low/High	New
LM	Continue to make county officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department	1 - 5 years	County	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Community Development Department	1 - 3 years	County	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249
(Sheet 2 of 4)
Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Community Development Continued…													
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Community Development Department	1 - 3 years	County	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Community Development Department	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Community Development Department	1 - 5 years	County	Low/Medium	Existing (2010)
LM	Develop "hazard information centers" on the County's website and in public libraries where individuals can find information about the risks to life and property associated with natural hazards and the proactive actions that they can take to reduce or eliminate their risk.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Community Development Department	1 - 5 years	County	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure
DR	Drought
EH	Excessive Heat
EQ	Earthquake
F	Flood
L	Landslide
LF	Levee Failure
MS	Mine Subsidence
SS	Severe Storms (Thunderstorms, Hail, Lightning)
SWS	Severe Winter Storms & Excessive Cold
T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities
SP	Structural Projects
PI	Public Involvement
S	Studies
MP	Miscellaneous Projects
PP	Property Protection

Tazewell County

Figure 249 (Sheet 3 of 4) Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Emergency Management Agency													
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilitates within the County and participating jurisdictions.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Low	New
LL	Partner with classified dams owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Emergency Management Agency	5 years	County/ Classified Dam Owners	Low/Medium	New
HM	Purchase and distribute NOAA weather radios to vulnerable County residents.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 - 5 years	County	Low/High	Existing (2010)
HM	Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	1 - 3 years	County	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249 (Sheet 4 of 4) Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	2 - 4 years	County	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Medium	Existing (2010)
LL	Disseminate information on the risks associated with earthquakes.	EQ	PI	Reduces	Large	1, 2	Yes	Yes	Emergency Management Agency	1 - 5 years	County	Low/Low	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure
DR	Drought
EH	Excessive Heat
EQ	Earthquake
F	Flood
L	Landslide
LF	Levee Failure
MS	Mine Subsidence
SS	Severe Storms (Thunderstorms, Hail, Lightning)
SWS	Severe Winter Storms & Excessive Cold
T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities
SP	Structural Projects
PI	Public Involvement
S	Studies
MP	Miscellaneous Projects
PP	Property Protection

Tazewell County

Figure 250
(Sheet 1 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Develop a sewer truck line inspection plan/program to monitor lines located in remote ravines for potential impacts caused by natural hazard events.	EQ, F, L, SS, SWS, T	S	Reduces	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1-2 years	City	Low/High	New
HM	Setup a ravine stormwater monitoring program to gather data and identify events that have the potential to impact City infrastructure (i.e., sewer lines, roadways, etc.)	SS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	Street Department of Public Works	1-2 years	City	Low/High	New
HM	Strengthen the utilization of the City's CodeRED notification system to inform potentially impacted areas of natural hazard events.	DF, EH, EQ, F, SS, SWS, t	MP	Reduces	Large	2	n/a	n/a	Fire Department/ Public Works	1-2 years	City	Low/High	New
LM	Update existing digital data sets of City utilities (including sewer, water and storm sewer distribution lines) and geo-locate critical infrastructure for use with GIS mapping applications.	DF, EQ, F, L, SS, SWS, T	MP	Reduces	Large	2, 3, 5	Yes	Yes	GIS Department	1-2 years	City	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 2 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop a sanitary sewer system master plan with the goal of decreasing storm water infiltration and excess flow within the system. The plan should efficiently track system maintenance and identify areas where infiltration of storm water has the potential to occur.	F, SS, SWS	S	Reduces	Large	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 2 years	City	Low/Medium	New
LM	Conduct sanitary sewer line reconnaissance study to identify locations where storm water infiltrates the system.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 5 years	City	Medium/Medium	New
HM	Repair/reline sanitary sewer line sections to reduce stormwater infiltration and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 5 years	City	Medium/High	New

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Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
- LL Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- LF Levee Failure
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Tazewell County

Figure 250 (Sheet 3 of 4) East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Improve coordination between Public Works, Police and Fire in an effort to implement hazard mitigation projects activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, L, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 year	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 4 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	1 - 4 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Department of Public Works	3 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	GIS Department	2 - 4 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 1 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Prairie Creek Channel, Floodplain & Tailwaters Improvements:* Make improvements to the 3.1-mile unimproved reach of Prairie Creek located between Queenwood Rd. and Allentown Rd. which serves as a discharge for a large portion of the developed watershed within the Village. The improvements will help maintain the creek's current flood control function for the upstream watershed and correct damages occurring within the downstream watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	5 years	FEMA Flood Mitigation Assistance	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
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Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- LF Levee Failure
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Tazewell County

Figure 251
(Sheet 2 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Prairie Creek Headwaters Improvements:* Make improvements to the Village's Detroit Parkway Detention Basin at the headwaters of Prairie Creek to help protect both upstream and downstream properties within the watershed from flooding problems. Improvements/expansion of this existing regional detention basin likely includes but is not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Flood Mitigation Assistance/ Pre-Disaster Mitigation	High/High	New

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Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 3 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Bull Run Creek & Tributaries Detention Basin:* Develop a regional detention basin(s) and other related conveyance improvements upstream and alongside Bull Run Creek and its tributaries to relieve hydraulic congestion and reduce flood stages within the Creek, its tributaries and the watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Pre-Disaster Mitigation	Medium/High	New

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Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 4 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	*Deer Creek Channel & Floodplain Improvements:* Make improvements to the 2.5-mile unimproved reach of Deer Creek located between I-74 and Queenwood Rd. which serves as a discharge for a portion of the eastern developed watershed within the Village. The improvements will help maintain the creek's current flood control function for the upstream watershed and correct damages occurring within the downstream watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Pre-Disaster Mitigation	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 5 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Bull Run Creek Floodplain Mitigation Projects:* Elevate flood-prone residential structures located in the SFHA along/adjacent to Bull Run Creek and its tributary confluence at N. Ohio Ave. and Ohio Ct. and/or acquire the properties and remove any existing structures to alleviate flooding problems and mitigate the flood risk.*	F, SS	PP	Eliminates	Small	2, 6	n/a	Yes	Village Board / Department of Public Works	2-5 years	FEMA Flood Mitigation Assistance	Medium/High	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to address the failing drainage system associated with the at-grade crossing of N. Main St. and the Norfolk Southern Railroad on the northeast side of the Village. Coordinate study with the railroad.	F, SS	S	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	Norfolk Southern/ IDOT Local Roads	Low/Medium	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 6 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Select, design and construct the appropriate improvement(s)/remedy(s) to alleviate drainage problems and better manage stormwater associated with the at-grade crossing of N. Main St. and the Norfolk Southern Railroad on the northeast side of the Village. Coordinate the implementation of the appropriate remedy(s) with the railroad.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	Norfolk Southern/ IDOT Local Roads	Medium/Medium	New
HM	Bury power lines along N. Morton Ave. to Lettie Brown Elementary School & subdivisions north of Lakeview Dr. to limit service disruptions and road blockages by downed lines during natural hazard events. This area is heavily wooded and can only be accessed by N. Morton Ave.	SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 - 5 years	FEMA Pre-Disaster Mitigation	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 7 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Trim trees and remove dead material to minimize utility service disruptions and road blockages along N. Morton Ave. to Lettie Brown Elementary School & subdivisions north of Lakeview Dr.	SS, SWS, T	MP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 - 5 years	Village	Low/High	New
HM	Collaborate with developers on any future development east of Hyde Park Dr. (located off of N. Morton Ave.) to ensure proper layout and construction of a roadway that provides secondary access to Lettie Brown Elementary School and subdivisions to the west.	F, SS, SWS, T	SP	Eliminates	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 -5 years	Village	High/High	New
LM	Conduct sewer line reconnaissance study to identify locations where storm water infiltrates the lines to improve the capacity, function and reliability of the Village's wastewater treatment plants.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	5 years	Village	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 8 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Repair/reline sewer line sections to reduce stormwater infiltration, improve the capacity, function and reliability of the Village's wastewater treatment plants and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Ye	Yes	Village Board / Department of Public Works	5 years	Village	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board Village Clerk	1 - 3 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 9 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	3 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 1 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Conduct a drainage/hydraulic study to determine the appropriate remedy(s) to alleviate recurring Illinois River flooding along Front Street and better protect the wastewater treatment facility which is located in the base floodplain of the Illinois River.	F, SS, SWS	S	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council City Engineer	5 years	FEMA Flood Mitigation Assistance	Medium/Medium	New
HM	Select, design and construct the appropriate remedy(s) to alleviate Illinois River flooding along Front Street and better protect the wastewater treatment facility which is located in the base floodplain of the Illinois River.	F, SS, SWS	SP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council City Engineer	5 years	FEMA Flood Mitigation Assistance	High/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 2 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	2 - 4 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	3 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 3 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council Public Works Department	5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 153
(Sheet 1 of 2)
Tremont Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install a new electronic warning siren system with public address capabilities within the Village to replace the two outdated sirens currently in use.	SS, T	MP	Reduces	Large	2	n/a	n/a	President/ Village Board	3 - 5 years	City/ IDOA	Medium/High	New
HM	Purchase and install automatic emergency backup generators at drinking water well sites to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Large	2, 3, 5	Yes	Yes	President/ Village Board	2 - 5 years	City/ DCEO	Medium/High	New
HM	Purchase and install an automatic emergency backup generator at Locust Street lift station to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board	2 - 5 years	City/ DCEO	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 153 (Sheet 2 of 2) Tremont Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President Village Board/ Village Clerk	1 - 3 years	Village	Low/High	New
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	3 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 1 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	*Washington Estates Flood Mitigation Project*: Construct upstream detention basin, channelize/reshape Tributary No. 2 and extend storm sewer to the Washington Estates Subdivision to better manage stormwater runoff, increase carrying capacity and alleviate drainage/flooding problems.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Mayor City Council/ Public Works Director	5 years	FEMA Pre-Disaster Mitigation	High/Medium	New
LM	*School Street Detention Basin Dam Reconfiguration Project:* Conduct a study to determine the potential impacts reconfiguring the School Street Detention Basin Dam would have on flood protection to downstream residents.	DF, F, SS	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	5 years	City	Low/Medium	New
HM	*Rolling Meadows Stormwater Mitigation Project:* Replace/upsize culverts in the Rolling Meadows Subdivision to maintain/increase carrying capacity and reduce/prevent drainage/flooding problems.	F, SS	SP	Reduces	Small	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	5 years	IDOT Local Roads	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 2 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Water Treatment Plant #1 Flood Protection Project:* Select, design and construct the appropriate remedy(s) outlined in the Water Treatment No. 1 Flood Protection Investigation Planning Report (Sept. 2018) to reduce the likelihood of a flood event impacting Water Treatment Plant No. 1. Currently the treatment plant is located in the base/500-year floodplain of Farm Creek.	F, SS	SP	Reduces	Medium	2, 3, 5	n/a	Yes	Mayor/ City Council Public Works Director	2 years	FEMA Flood Mitigation Assistance	Medium/High	New
LM	*East Side Regional Drainage Flood Mitigation Project:* Conduct a drainage/hydraulic study to determine the appropriate remedy(s) to address potential flood problems associated with Farm Creek at the east end of the City.	F, SS	S	Reduces	Small	2, 3, 5	Yes	Yes	Mayor/ City Council Public Works Director	5 years	FEMA Flood Mitigation Assistance	Low/Medium	New
LM	Submit Letters of Map Revisions (LOM-R) when needed for areas within the City.	F	MP	Reduces	Small	4, 6	Yes	Yes	Mayor/ City Council Public Works Director	1 - 5 years	City	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 3 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	*Farm Creek Railroad Structures Project:* Select and implement the appropriate remedy(s) (i.e., stream modifications, set-aside/compensatory storage, acquisitions, etc.) to alleviate flooding problems associated with the two TP&W Railroad bridges and old railroad bridge/park district bike trail over Farm Creek.	F, SS	SP	Reduces	Small	2, 3, 5, 6	n/a	Yes	Mayor City Council/ Public Works Director	5 years	FEMA Flood Mitigation Assitance	High/High	New
LM	Designate Five Points as a warming center for city residents.	SWS	MP	Reduces	Small	2	n/a	n/a	Mayor City Council/ Five Points Washington	1 - 3 years	City	Low/High	New
HM	Purchase and install an automatic emergency backup generator at Five Points Washington (a designated warming center) to provide uninterrupted during power outages.	SWS	MP	Eliminates	Small	2	n/a	Yes	Mayor City Council/ Five Points Washington	3 - 5 years	City/ Five Points Washington	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 4 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify strategic locations within the City to site community safe rooms (tornado shelters) and determine whether existing public buildings can be retrofitted to include community safe rooms or if standalone structures need to be erected.	SS, T	S	Reduces	Medium	2	Yes	Yes	Mayor City Council/ Public Works Director	5 years	City	Low/Medium	New
HM	Retrofit an existing public building and/or construct a new standalone structure to serve as a community safe room (tornado shelter) for City residents.	SS, T	SP	Reduces	Small	2	Yes	Yes	Mayor/ City Council	1 - 5 years	FEMA Pre-Disaster Mitigation	Medium/High	New
HM	Clear wooded ravine easements to help access and maintain sanitary sewer and manholes. The City owns and maintains approximately 80 miles of sanitary sewer and has approximately 18,700 linear feet of wooded ravine easements.	EQ, F, L, SS, SWS, T	MP	Reduces	Medium	2, 3, 5	Yes	Yes	Public Works Director	1 - 5 years	City	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
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F	Flood		
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LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 5 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Provide crossing protection (i.e., riprap, caging, etc.) for sanitary sewer line stream crossings. There are 70 sanitary sewer stream crossings within the City's system that would benefit from protection.	F, SS, SWS	SP	Reduces	Small	2, 3, 5, 6	Yes	Yes	Public Works Director	1 - 5 years	City	Medium/High	New
HM	Reconfigure 4 aerial sanitary sewer line stream crossings to meet guidelines for storm conveyance.	F, SS, SWS	SP	Reduces	Small	2, 3 5, 6	Yes	Yes	Public Works Director	5 years	City	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor City Council/ City Clerk	1 - 2 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 6 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor City Council/ Public Works Director	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

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F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254 (Sheet 7 of 7) Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Public Works Director	2 - 5 years	City	Low/Medium	Existing 2010)
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Public Works Director	2 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	2 - 4 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 1 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
County Board													
LM	Improve coordination between the County, townships, cities and villages in an effort to help implement hazard mitigation projects and cleanup activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	Emergency Management Agency	1 - 5 years	County	Low/High	New
HM	Purchase and install an automatic emergency backup generator at the County Courthouse to provide uninterrupted power to the Emergency Operations Center/Joint Information Center (County Board Room) and maintain operations during a power outage.	DF, EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	5 years	County/ DCEO	Medium/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 38,700 individuals) and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 2 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Building/Zoning													
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department/ County Board	1 - 5 years	County	Low/High	New
LM	Continue to make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department	1 year	County	Low/High	New
LM	Continue to make county officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department	1 - 5 years	County	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Building/Zoning Department	1 - 3 years	County	Low/High	Existing (2010)

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EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255 (Sheet 3 of 6) Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Building/Zoning Continued…													
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Building/Zoning Department	1 - 5 years	County	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Building/Zoning Department	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Building/Zoning Department	1 - 5 years	County	Low/Medium	Existing (2010)
Emergency Management Agency													
HM	Purchase portable, trailer-mounted LED emergency message boards to alert the public of hazardous conditions associated with natural hazard events.	DF, EH, DQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	2 - 4 years	County	Low/Medium	New

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- DF — Dam Failure
- DR — Drought
- EH — Excessive Heat
- EQ — Earthquake
- F — Flood
- L — Landslide
- LF — Levee Failure
- MS — Mine Subsidence
- SS — Severe Storms (Thunderstorms, Hail, Lightning)
- SWS — Severe Winter Storms & Excessive Cold
- T — Tornado

Type of Mitigation Activity:

- RA — Regulatory Activities
- SP — Structural Projects
- PI — Public Involvement
- S — Studies
- MP — Miscellaneous Projects
- PP — Property Protection

Woodford County

Figure 255
(Sheet 4 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
HM	Purchase and install storm warning sirens in unincorporated communities and subdivisions within the County that do not have coverage.	SS, T	MP	Reduces	Small	2	n/a	n/a	Emergency Management Agency	3 - 5 years	County/ DCEO	Medium/High	New
HM	Purchase a new siren encoder (siren control unit) that can be utilized as a backup to activate sirens in all the communities in the County.	SS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 year	County	Low/High	New
HL	Develop an early warning notification system to alert residents along the Mackinaw River in the event of a dam failure at Lake Evergreen Dam.	DF	PI	Reduces	Small	2	n/a	n/a	Emergency Management Agency	1 year	County	Medium/Medium	New
LL	Partner with classified dam owners to develop Emergency Action Plans (EAPs) that identify the extent (water depths, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Emergency Management Agency	5 years	County/ Classified Dam Owners	Low/Medium	New

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F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255 (Sheet 5 of 6) Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the County and participating jurisdictions.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Emergency Management Agency	3-5 years	County	Low/Low	New
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Medium	Existing (2010)
HM	Purchase and distribute NOAA weather radios to schools, churches and other gathering places.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 - 5 years	County	Low/High	Existing (2010)
HM	Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	1 - 2 years	County	Low/High	Existing (2010)

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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 6 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
LM	Develop and implement a community outreach program that informs residents of the risks to life and property associated with natural hazards and the proactive actions that they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, T	PI	Reduces	Large	1, 2	Yes	Yes	Emergency Management Agency	2 - 5 years	County	Low/High	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Emergency Management	3 - 5 years	County	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources; then implementation of medium to large-scale activities/projects is unlikely due to the city's size (just over 5,300 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 1 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install sewer valves at wastewater treatment plant to isolate system operations and protect plant functions during heavy rain events.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / WWTP	1 year	City	Low/High	New
LM	Obtain approval from Illinois Department of Natural Resources to construct flood wall/berm around the wastewater treatment plant.	F, SS	MP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / WWTP	2-3 years	City	Low/High	New
HM	Construct flood wall/berm around the wastewater treatment plant to address recurring flood problems associated with Walnut Creek.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / Wastewater Treatment Plant	2-3 years	FEMA Flood Mitigation Assistance	Medium/High	New
HM	Incorporate a community safe room (tornado shelter) into the design and construction of a new combined city services building for use by city employees and area residents.	SS, T	SP	Reduces	Small	2	Yes	n/a	City Council / Public Safety and Administration Committee	2 years	FEMA Pre-Disaster Mitigation	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 5,300 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 2 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Install/upsize new water mains and fire hydrants at various locations within the City to ensure a constant supply of water for residents and aid in fire suppression during natural hazard events.	DR, EH, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City	High/Medium	New
HM	Repair/reline sewer line sections to reduce stormwater infiltration and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Ye	Yes	City Council / Enterprise Committee	1 - 5 years	City	Medium/High	New
LM	Continue construction of water main loops to provide redundancy in the system, minimize service disruptions as a result of pipe or water main breaks and aid in fire suppression in the event of a natural hazard.	EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City	Medium/Medium	New
HM	Upgrade/upsize storm sewer system in areas prone to flooding to increase capacity and better manage runoff.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	3 - 5 years	City	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 5,300 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 3 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)[†]	Cost/Benefit Analysis	Status
HM	Upgrade/upsize stormwater drainage system (ditches, culverts, etc.) in areas prone to flooding to better manage runoff and alleviate flooding concerns.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City/ IDOT Local Roads	Medium/High	New
LM	Collaborate with the County's Emergency Management Agency to develop a more robust Emergency Services Department within the City.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	Yes	Yes	Mayor/ City Council	2 - 4 years	City	Low/High	New
HM	Purchase portable trash pump, 8" or larger, to remove excess water from critical facilities/infrastructure during heavy rain/flood events.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Public Works	3 years	City	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 5,300 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 4 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	City Clerk/ Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257
(Sheet 1 of 4)
Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Retrofit an existing public building and/or construct a new structure to serve as a community safe room (tornado shelter) equipped with emergency backup generator and HVAC units that can also be used as an emergency shelter and heating/cooling center for Village residents.	EH, EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New
HM	Retrofit the Village Hall, Maintenance Building/Shop and Wastewater Treatment Plant to high wind standards (including but not limited to installation of a roof anchoring system) to protect the buildings from high wind damage.	SS, T	SP	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	Medium/Medium	New
HM	Install shatter-proof glass at the Village Hall and Wastewater Treatment Plant to make the buildings resistant natural hazard events.	EQ, SS, T	SP	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257 (Sheet 2 of 4) Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Repair/reline sewer line sections where storm water infiltration is occurring to prevent sewage backups in the Whispering Oaks subdivision.	F, SS, SWS	SP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City	Medium/High	New
HM	Purchase a portable emergency backup generator for use at lift stations to maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Low/High	New
HM	Purchase and install emergency backup generators with automatic transfer switches at Coventry Farms1 and Deer Ridge onsite lift stations to provide uninterrupted power and maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Medium/High	New
HM	Purchase and install a new emergency backup generator at Wastewater Treatment Plant 1 to provide uninterrupted power and maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257
(Sheet 3 of 4)
Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Inventory, scan and store off site (cloud-based storage) vital village records (including sewer & water records) to protect and maintain service in the event a natural hazard event impacts Village Hall.	EQ, F, SS, SWS, T	MP	Eliminates	Large	5, 8	n/a	n/a	President/ Village Board/ Village Administrator	5 years	City	Medium/High	New
HM	Purchase and install an automatic emergency backup generator at Village Hall to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	n/a	Yes	President/ Village Board/ Public Works Department	3 years	City/ DCEO	Medium/High	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to alleviate recurring drainage/flooding problems within the City.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Select, design and construct the appropriate remedy(s) to alleviate recurring drainage/flooding problems within the City.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	High/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257 (Sheet 4 of 4) Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install curb and gutter at various locations within the Village to help direct the flow of stormwater runoff to drainage structures in an effort to alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Reshape and regrade select high impact drainage ditches to increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Remove debris, vegetative overgrowth, brush from streams and creeks within the City to maintain/increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	1 - 5 years	Village	Low/High	New
HM	Clean debris/obstructions out of culverts to maximize carrying capacity and reduce/prevent drainage problems.	F, SS, SWS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	1 - 5 years	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 1 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Obtain elevation certificates for all municipal buildings located in the floodplain.*	F	S	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	1 year	Village	Low/High	New
HM	Design and construct a community safe room (tornado shelter) that is equipped with an emergency backup generator and HVAC units as part of new a community center. The community safe room can be used as warming/cooling center and emergency shelter for village residents.	EH, EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New
HM	Retrofit an existing public building and/or construct a new standalone structure to serve as a community safe room (tornado shelter) for City residents.	SS, T	SP	Reduces	Small	2	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 2 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Relocate Village Hall and Public Works out of the West Branch Panther Creek base floodplain to provide continuity/continuation of services during flood events.*	F, SS, SWS	PP	Eliminates	Small	2, 3, 5	Yes	n/a	President/ Village Board	5 years	FEMA Flood Mitigation Assistance	High/High	New
HM	Remove debris, vegetative overgrowth, and brush from streams and creeks within the Village to maintain/increase carrying capacity, better manage stormwater runoff and reduce the risk of flooding.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	1 - 5 years	Village	Low/High	New
LM	Inventory, scan and store off site vital village records to protect and maintain service in the event a natural hazard event impacts Village Hall.	EQ, F, SS, SWS, T	MP	Eliminates	Large	5, 8	n/a	n/a	President/ Village Board/ Village Clerk	2 years	Village	Medium/High	New
HM	Acquire flood-prone properties and removed existing structures.*	F, SS, SWS	PP	Eliminates	Small	2, 6	n/a	Yes	President/ Village Board	3 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258 (Sheet 3 of 5) Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board/ Village Clerk	1 - 2 years	Village	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Participate in the National Flood Insurance Program's voluntary Community Rating System to lower flood insurance rates for residents.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	1 year	Village	Low/High	Existing (2010)

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† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 4 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	President/ Village Board	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the Village to assist in street identification in the event of widespread natural hazard damage.	EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	President/ Village Board/ Department of Public Works	1 - 5 years	Village	Low/Medium	Existing 2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 5 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Develop "hazard information centers" at the public library and on the Village's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	President/ Village Board	2 - 3 years	Village	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	5 years	Village	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Medium	Existing (2010)

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EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 259
(Sheet 1 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HL	Remove existing residential and commercial structures from subsidence hazard areas.	MS	PP	Eliminates	Small	2	n/a	Yes	President/ Village Board	1 year	Village/ FEMA Pre-Disaster Mitigation	Medium/High	New
LM	Develop and implement winter weather risk awareness activating that educates residents about severe winter storms and extreme cold and the actions they can take to protect themselves.	SWS	PI	Reduces	Large	1, 2	Yes	Yes	President/ Village Board	1 year	Village	Low/High	New
LM	Identify access and function needs residents and coordinate with local organizations to provide: 1) educational materials on emergency preparedness and the actions that can be taken to reduce or eliminate the risks to life and property associated with natural hazard events and 2) assistance/supportive services during and after natural hazard events.	EH, EQ, F, L, MS, SS, SWS, T	PI	Reduces	Small	1, 2	Yes	Yes	President/ Village Board	1 year	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,400 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- LF Levee Failure
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Participating Peoria County Jurisdictions

Figure 259
(Sheet 2 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Develop and implement a community outreach program that educates residents about mine subsidence and the actions residents can take to protect themselves and their property.	MS	PI	Reduces	Medium	1, 2	Yes	Yes	President/ Village Board	2 years	Village	Low/Medium	New
LM	Conduct a drainage/hydraulic study to determine the number of pump stations and associated piping/containment needed to alleviate recurring Kickapoo Creek flooding impacting homes and businesses along Illinois Route 24.	F, SS, SWS	S	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	1 year	Village/ FEMA Flood Mitigation Assistance/ IDOT Local Roads	Medium/Medium	New
HM	Install pump stations with automatic emergency backup generators at selected locations to alleviate recurring Kickapoo Creek flooding impacting homes and businesses along Illinois Route 24.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	2 years	Village/ FEMA Flood Mitigation Assistance/ IDOT/ Local Roads	High/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,400 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
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F	Flood		
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LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 259
(Sheet 3 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase portable, trailer-mounted changeable emergency message boards to alert the public of hazardous conditions, detours, evacuations, etc. associated with natural hazard events.	EH, EQ, F, L, MS, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village	Low/Medium	New
LM	Designate warming/cooling centers within the Village for use by residents and secure hosting agreements with each location.	EH, SWS	MP	Reduces	Small	2	n/a	n/a	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village	Low/High	New
HM	Bury utility lines to critical facilities to limit service disruptions during natural hazard events.	SS, SWS, T	MP	Eliminates	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village/ FEMA Pre-Disaster Mitigation	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

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EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 259
(Sheet 4 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	New
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board/ Village Clerk	1 - 5 years	Village	Low/Medium	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 -2 years	Village	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the Village.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Low	New

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DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 259
Additions – 2020 Annual Plan Monitoring & Evaluation
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Purchase a stand-alone server with software to backup the Village's computer files.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Large	3, 5, 8	n/a	n/a	President / Village Board / Village Clerk	2 years	Village	Low/Medium	New

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 260
(Sheet 1 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3 - 5 years	Village	Low/Low	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council/ City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 260
(Sheet 2 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)

* Mitigation action to ensure continued compliance with NFIP.

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DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 260
(Sheet 3 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 3 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	3 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 6,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 261
(Sheet 1 of 5)
Greater Peoria Sanitary District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Flood Hazard Mitigation & Levee Certification Study Recommendation – Kickapoo Interceptor Flow Control Structure:* Construct a large sluice gate along the Kickapoo Interceptor just outside the GPSD Levee that can be closed in the event the Interceptor is compromised by floodwater. The Kickapoo Interceptor is one of two sewers that brings wastewater into the treatment plant, and at present, there is no means to throttle the flow of the sewer. Floodwaters have covered the Interceptor previously and if the sewer becomes compromised during a flood event, floodwaters will enter the wastewater treatment plant at an uncontrolled rate, incapacitating the wastewater treatment plant and leaving much of the County without treatment capability including key critical facilities such as hospitals.	F	SP	Reduces	Large	2, 3, 5, 6	n/a	Yes	Director of Planning & Construction	3 years	GPSD / FEMA Building Resilient Infrastructure & Communities	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the budgetary constraints experienced by this special unit of local government. The District works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 261
(Sheet 2 of 5)
Greater Peoria Sanitary District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Flood Hazard Mitigation & Levee Certification Study Recommendation – Effluent Channel Control Structure:* Construct an effluent channel control structure (gate) to allow the District to control the water levels in the two tertiary lagoons during flood events. Control of the water surface levels in the tertiary lagoons was identified as a way to limit seepage and maintain the hydrostatic pressure in the soils of the GPSD Levee to preserve slope stability during flood events.	F, LF	SP	Reduces	Large	2, 3, 5, 6	n/a	Yes	Director of Planning & Construction	3 years	GPSD / FEMA Building Resilient Infrastructure & Communities	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the budgetary constraints experienced by this special unit of local government. The District works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure
DR	Drought
EH	Excessive Heat
EQ	Earthquake
F	Flood
L	Landslide
LF	Levee Failure
MS	Mine Subsidence
SS	Severe Storms (Thunderstorms, Hail, Lightning)
SWS	Severe Winter Storms & Excessive Cold
T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities
SP	Structural Projects
PI	Public Involvement
S	Studies
MP	Miscellaneous Projects
PP	Property Protection

Participating Peoria County Jurisdictions

Figure 261
(Sheet 3 of 5)
Greater Peoria Sanitary District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Flood Hazard Mitigation & Levee Certification Study Recommendation – Levee Grading & Drainage Improvements:* Raise the crest of the GPSD Levee to meet or exceed minimum freeboard requirements, install sub-surface seepage layers and a collection system to limit the buildup of groundwater and maintain slope stability requirements, construct headwall and removeable flood barrier systems at the plant entrance drives and fill in low-lying areas that exhibit seepage and boils during major flood events to meet FEMA's levee certification requirements and prepare for major flood events. Protecting the wastewater treatment plant from flooding not only safeguards critical infrastructure, it also reduces the risk of major service interruptions to other critical infrastructure such as hospitals.	F, LF	SP	Reduces	Large	2, 3, 5, 6	n/a	Yes	Director of Planning & Construction	3 years	GPSD / FEMA Building Resilient Infrastructure & Communities	High/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the budgetary constraints experienced by this special unit of local government. The District works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 261
(Sheet 4 of 5)
Greater Peoria Sanitary District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Levee Improvements Letter of Map Revision (LOMR):* Upon completion of the Kickapoo Interceptor, the Effluent Channel Control Structure & the Levee grading and drainage improvements, prepare and submit the required documentation to obtain a FEMA Letter of Map Revision and levee accreditation to remove the levee protected area from the Special Flood Hazard Area.	F, LF	PP	Reduces	Large	2, 3, 5, 6	n/a	Yes	Director of Planning & Construction	5 years	GPSD	Low/High	New
LL	Identify collection system infrastructure located in areas vulnerable to landslides.	L	S	Reduces	Medium	2, 3, 5	Yes	Yes	Director of Planning & Construction	5 years	GPSD	Low/Medium	New
LL	Identify collection system infrastructure located in areas vulnerable to mine subsidence.	MS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Director of Planning & Construction	5 years	GPSD	Low/Low	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the budgetary constraints experienced by this special unit of local government. The District works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 261
(Sheet 5 of 5)
Greater Peoria Sanitary District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HL	Distribute educational materials that inform staff and customers about the risks associated with natural hazard events impacting the District's service area, including those related to the sewer collection system, and the proactive actions they can take to reduce their risk.	DF, DR, EH, EQ, F, L, LF, MS, SS, SWS T	PI	Reduces	Large	1, 2	Yes	Yes	Director of Planning & Construction	3-5 years	GPSD	Low/Low	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the budgetary constraints experienced by this special unit of local government. The District works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 262
(Sheet 1 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Construct a new water tower to increase the amount of water available in reserve, improve resiliency to drought and to aid in fire suppression as necessary during natural hazard events.	DR, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/High	New
LM	Purchase a stand-alone server with software to back up the Village's computer files.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Large	3, 5, 8	n/a	n/a	President/ Village Board/ Village Clerk	2 years	Village	Low/Medium	New
HM	Design and construct a community safe room (tornado shelter) equipped with emergency backup generator and HVAC units that can also serve as an emergency shelter/warming and cooling center for Village residents.	EH, F, SS, SWS, T	SP	Reduces	Large	2	Yes	n/a	President/ Village Board	4 years	FEMA Pre-Disaster Mitigation	High/High	New
LM	Identify residents with access and functional needs and create a volunteer network to assist these residents during a natural hazard event.	DF, EH, EQ, F, SS, SWS, T	PI	Reduces	Small	1, 2	n/a	n/a	President/ Village Board	1 year	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 1,200 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 262
(Sheet 2 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install curb and gutter at various locations within the Village to help direct the flow of stormwater runoff to drainage structures in an effort to alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Streets Department	3 years	Village/ IDOT Local Roads	Medium/Medium	New
LM	Conduct a sewer line reconnaissance study to identify locations where storm water infiltrates the lines.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	3 years	Village	Medium/High	New
HM	Repair/reline sewer line sections where storm water infiltration is occurring to prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/High	New
LM	Improve coordination between the village, township and County in an effort to help implement hazard mitigation projects and cleanup activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	1 year	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 1,200 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 262
(Sheet 3 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Install/upsize new water mains and fire hydrants at various locations within the Village to ensure a constant supply of water for residents and aid in fire suppression during natural hazard events.	DR, EH, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/Medium	New
HM	Purchase and install sewer valves at wastewater treatment plant to isolate system operations and protect plant functions during heavy rain events.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Water & Sewer Department	3 years	Village	Low/High	New
LM	Locate and label all public hydrants in the Village to assist in street identification in the event of widespread natural hazard damage.	EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	President/ Village Board/ Department of Public Works	5 years	Village	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 1,200 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
- LL Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- LF Levee Failure
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Participating Peoria County Jurisdictions

Figure 262
(Sheet 4 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	2 years	Village	Low/Medium	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the Village.	EQ	S	Reduces	Small	2 , 3 5, 7	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Low	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 1,200 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 263 (Sheet 1 of 4) Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install automatic emergency backup generators at all Fire Stations not currently equipped with one to provide uninterrupted power and maintain operations and communication capabilities during a power outage. All fire stations in the City serve as warming/cooling centers for city residents.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	n/a	Yes	Fire Department	5 years	Village/ DCEO	Medium/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 year	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 263
(Sheet 2 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3-5 years	City	Low/Low	New
LL	Partner with classified dams owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Mayor/ City Council	5 years	City/ Classified Dam Owners	Low/Medium	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council/ City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 263
(Sheet 3 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Purchase and distribute NOAA weather radios to vulnerable residents.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Fire Department	1 - 5 years	City	Low/High	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
- LL Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- LF Levee Failure
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Participating Peoria County Jurisdictions

Figure 263
(Sheet 4 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	2 - 4 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 264
(Sheet 1 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3 - 5 years	City	Low/Low	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 264
(Sheet 2 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado
LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Participating Peoria County Jurisdictions

Figure 264
(Sheet 3 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	2 - 3 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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DF	Dam Failure	MS	Mine Subsidence
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LF	Levee Failure		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
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PI	Public Involvement	PP	Property Protection

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5.0 PLAN MAINTENANCE

5.0 PLAN MAINTENANCE

This section focuses on the Federal Emergency Management Agency (FEMA) requirements for maintaining and updating the Plan once it has been approved by FEMA and adopted by the participating jurisdictions. These requirements include:

- establishing the method and schedule for monitoring, evaluating and updating the Plan;
- describing how the mitigation strategy will be incorporated into existing planning processes; and
- detailing how continued public input will be obtained.

These requirements ensure that the Plan remains an effective and relevant document. Provided below is detailed discussion of each requirement.

5.1 MONITORING, EVALUATING & UPDATING THE PLAN

Outlined below is a method and schedule for monitoring, evaluating and updating the Plan. This method allows the participating jurisdictions to review and adjust the planning process as needed, make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

5.1.1 MONITORING AND EVALUATING THE PLAN

The updated Plan will be monitored and evaluated by a subcommittee of the Mitigation Advisory Committee (MAC) on an annual basis. The MAC subcommittee will be composed of key members from the MAC, including representatives from all of the participating jurisdictions. The subcommittee will be chaired by the Tri-County Regional Planning Commission (TCRPC). All meetings held by the subcommittee will be open to the public. The information gathered at each subcommittee meeting will be documented and provided to all participating jurisdictions for their review and use in the Plan update.

The TCRPC will be responsible for monitoring the status of the mitigation actions identified in the updated Plan and providing the Illinois Emergency Management Agency (IEMA) with an annual progress report. It will be the responsibility of each participating jurisdiction to provide a progress report on the status of their mitigation actions at each subcommittee meeting.

Monitoring & Evaluating

- A MAC subcommittee will be formed to monitor and evaluate the updated Plan.
- The updated Plan will be monitored and evaluated on an ***annual basis***.
- Each participating jurisdiction will be responsible for providing an annual progress report on the status of their mitigation actions.
- New mitigation actions can be added by participating jurisdictions during the annual evaluation.

The MAC subcommittee will also evaluate the updated Plan on an annual basis to determine the effectiveness of the planning process and the implemented mitigation actions. In addition, the subcommittee will decide whether any changes need to be made. As part of the evaluation of the planning process, the subcommittee will review the goals to determine whether they are still relevant or if new goals need to be added; assess whether other natural hazards need to be addressed or included in the updated Plan and review any new hazard data that may affect the Risk Assessment portion of the updated Plan.

The subcommittee will also evaluate whether other county or municipal departments should be invited to participate.

In terms of evaluating the effectiveness of the mitigation actions that have been implemented, the subcommittee will assess whether a project is on time, in line with the budget and moving ahead as planned; whether the project achieved the goals outlined and had the intended result; and whether losses were avoided as a result of the project. In addition, each of the participating jurisdictions will be given an opportunity to add new mitigation actions to the updated Plan and modify or withdraw mitigation actions already identified. In some cases, a project may need to be removed from the list of mitigation actions because of unforeseen problems with implementation.

5.1.2 Updating the Plan

The Plan must be updated within five years of the date the first participating jurisdiction adopts the updated Plan. (This date can be found in Section 7, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant money to implement those mitigation actions identified in this Plan.

The Plan update will incorporate all of the information gathered and changes proposed at the previous annual monitoring and evaluation meetings. In addition, any government entity that did not take part in the previous planning process that now wishes to participate may do so. It will be the responsibility of these entities to provide all of the information needed to be integrated into the updated Plan.

Updating

- The Plan ***must be updated within 5 years*** of the date ***the first participating jurisdiction adopts*** the updated Plan.
- Any government entities that did not take part in the previous planning process but who now wish to participate may do so.
- Once the updated Plan has received FEMA/IEMA approval, ***each participating jurisdiction must re-adopt the Plan*** to remain eligible to receive federal grant money.

A public forum will be held to present the updated Plan to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the updated Plan. The updated Plan will then be submitted to IEMA and FEMA for review and approval. ***Once the updated Plan has received state and federal approval, FEMA requires that each of the participating jurisdictions re-adopt the Plan to remain eligible to receive federal grant money to implement the identified mitigation actions.***

5.2 Incorporating the Mitigation Strategy into Existing Planning Mechanisms

As part of the planning process, the MAC identified current plans, policies/ordinances and maps that supplement or help support mitigation planning efforts. **Figure 11** identifies the existing planning mechanism available by county by jurisdiction. It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the updated Plan into the planning mechanisms identified for their jurisdiction.

Adoption of this updated Plan will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The MAC's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage them to actively integrate it into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

Given that the TCRPC often assists and supports the participating jurisdictions in their planning efforts, they will also play a role in assuring the information presented in this Plan update is utilized and expanded on, when appropriate, in existing planning mechanisms. This can be achieved through discussions at regularly scheduled meeting with participating jurisdictions and when existing plans and programs are reviewed and updated.

5.3 CONTINUED PUBLIC INVOLVEMENT

The participating jurisdictions understand the importance of continued public involvement and will seek public input on the updated Plan throughout the plan maintenance process. A copy of the approved Plan Update will be maintained and available for review at the TCRPC's Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan Update to the TCRPC.

The comments received will be compiled and presented at the annual MAC subcommittee meetings where members will consider them for incorporation into the updated Plan. All meetings held by the MAC subcommittee will be noticed and open to the public. A separate public forum will be held prior to the next Plan Update submittal to provide the public an opportunity to comment on the proposed revisions to the updated Plan.

6.0 PLAN ADOPTION

6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved updated Plan by each participating jurisdiction. Each jurisdiction must formally re-adopt the Plan to remain eligible for federal grant money to implement mitigation actions identified in this Plan.

6.1 PLAN ADOPTION PROCESS

Before the updated Plan can be adopted by the participating jurisdictions, it must be made available for public review and comment through a public forum and comment period. Any comments received are incorporated into the updated Plan and the Plan is then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Once IEMA and FEMA have reviewed and approved the updated Plan, it will be presented to the participating jurisdictions for adoption. ***Each participating jurisdiction must formally adopt*** the Plan to remain or become eligible to receive federal grant money to implement the mitigation actions identified in this Plan. If any of the jurisdictions choose not to adopt the updated Plan, their choice will not affect the eligibility of those that do adopt the updated Plan.

Figure 265 identifies the participating jurisdictions and the date each formally adopted the updated Plan. Signed copies of the adoption resolutions are located in **Appendix N**. FEMA signed the final approval letter on October 23, 2019 which began the five-year approval period and set the an expiration date of October 23, 2024 for the Plan.

Figure 265
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date
Tri-County Regional Planning Commission	02/27/2020
Tazewell County	10/30/2019
East Peoria, City of	11/19/2019
Morton, Village of	11/04/2019
Pekin, City of	11/12/2019
Tremont, Village of	11/04/2019
Washington, City of	11/04/2019
Woodford County	10/15/2019
Eureka, City of	10/21/2019
Germantown Hills, Village of	10/17/2019
Roanoke, Village of	11/04/2019
Peoria County – Participating Municipalities Only	
Bartonville, Village of	10/28/2019
Chillicothe, City of	11/11/2019
Greater Peoria Sanitary District	01/19/2021
Hanna City, Village of	11/05/2019
Peoria, City of	11/12/2019
Peoria Heights, Village of	12/17/2019

7.0 REFERENCES

7.0 REFERENCES

Provided below is a listing, by section, of the resources utilized to create this document.

1.0 INTRODUCTION

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1.1 PARTICIPATING JURISDICTIONS

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1.1.1 TAZEWELL COUNTY

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6. U.S. Cluster Mapping. Harvard Business School, Institute for Strategy & Competitiveness. Regional Dashboard: Cluster Portfolio Tazewell County, IL. <http://clustermapping.us/region/county/tazewell_county_il/cluster-portfolio>.

1.1.2 WOODFORD COUNTY

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4. U.S. Cluster Mapping. Harvard Business School, Institute for Strategy & Competitiveness. Regional Dashboard: Cluster Portfolio Woodford County, IL. <http://clustermapping.us/region/county/woodford_county_il/cluster-portfolio>.
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1.1.3 PEORIA COUNTY

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