

# Multi-Hazard Mitigation Plan

## *Fulton County, IL*



The Polis Center  
IUPUI  
1200 Waterway Boulevard  
Suite 100  
Indianapolis, IN 46202



Fulton County ESDA  
20341 North State Route 97  
Cuba, IL 61427



Southern Illinois University Carbondale  
Department of Geology  
1259 Lincoln Drive  
Carbondale, IL 62901

**Multi-Hazard Mitigation Plan**  
**Fulton County, Illinois**

**Adoption Date:** -- \_\_\_\_\_ --

**Primary Point of Contact**

Chris Helle  
Director  
Fulton County Emergency Services Disaster Agency  
20341 North State Route 97  
Cuba, IL 61427  
Phone: 309-224-7701  
esda@farmingtonil.com

**Secondary Point of Contact**

Renea Stuckey  
Administrative Secretary  
Fulton County Board  
100 N. Main Street, Room 100  
Lewistown, IL 61542  
Phone: (309) 547-3041  
Fax: (309) 547-3326

**Prepared by:**

Department of Geology  
Southern Illinois University - Carbondale  
Carbondale, IL 62901

and

The Polis Center  
1200 Waterway Boulevard, Suite 100  
Indianapolis, IN 46202  
317-274-2455

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## Section 1 Introduction

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals; hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies is a primary mechanism in achieving FEMA's goal.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt an MHMP.

In recognition of the importance of planning in mitigation activities, FEMA created **Hazards USA Multi-Hazard (Hazu-MH)**, a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. Southern Illinois University at Carbondale (SIUC) and The Polis Center (Polis) at Indiana University - Purdue University Indianapolis (IUPUI) assisted Fulton County with performing the hazard risk assessment.

## Section 2 Planning Process

### 2.1 Timeline

The MHMP process is broken into a series of five meetings. These meetings are organized by SIUC and hosted by the Fulton County Emergency Services Disaster Agency. At these five meetings, various tasks are completed by SIUC and/or Polis and the county planning team:

**Meeting 1:** The purpose of Meeting 1 is to introduce the MHMP process and organize resources. SIUC gathers local resources which contribute to the detailed county risk assessment.

**Meeting 2:** SIUC presents the county's historical hazards. Based on this information, the planning team identifies natural hazards to include in the plan, and ranks hazards by potential damages and occurrences. The planning team also provides SIUC with disaster scenarios for the county risk assessment.

**Meeting 3:** At this meeting, SIUC and Polis present the draft risk assessment, derived from the Hazus-MH and GIS modeling of the identified disasters, to the planning team. The general public is also invited to this meeting through a series of newspaper articles and/or radio spots. At the end of the meeting, the general public is encouraged to ask questions and provide input to the planning process, fulfilling one of FEMA's requirements for public input.

**Meeting 4:** This meeting consists of a “brainstorming session.” The planning team lends local knowledge to identify and prioritize mitigation strategies and projects that can address the threats identified in the risk assessment. It is required that the plan contain strategies specific to each hazard and for each incorporated area within the county.

**Meeting 5:** At this meeting, the planning team reviews the draft plan, proposes revisions, and accepts the plan after the necessary changes are incorporated. Subsequently, SIUC will forward the county MHMP to the mitigation staff at the Illinois Emergency Management Agency for review prior to submitting to FEMA.

Due to the large number of jurisdictions within Fulton County, Chris Helle lead individual and public meetings through the SIUC planning process to inform all personnel that were not able to attend the regularly schedule meetings.

## 2.2 Planning Team Information

The Fulton County Multi-Hazard Mitigation Planning Team is headed by Chris Helle. Members of the planning team include representatives from various county departments, cities and towns, and public and private utilities. Table 2-1 identifies the planning team individuals and the organizations they represent.

**Table 2-1:** Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Chris Helle	Fulton County ESDA	Fulton County	Fulton County
Kevin DelMastro		OSF Saint Francis/RMERT	
Rick Nichols		Canton Police Department	City of Canton
Jane Brewer		American Red Cross	
Phil Fleming	City of Canton ESDA	City of Canton	City of Canton
Gordon James		Fulton County Health Dept.	Fulton County

The DMA 2000 planning regulations stress that planning team members from each jurisdiction be active participants in the MHMP process. The Fulton County mitigation planning team members were actively involved on the following components:

- Attending the MHMP meetings
- Providing available GIS data and historical hazard information
- Reviewing and providing comments on the draft plans
- Coordinating and participating in the public input process
- Coordinating the formal adoption of the plan by the county

A MHMP kickoff meeting was held at the Fulton County Health Department building on February 4, 2010. Representatives from SIUC and Polis Center explained the rationale behind the MHMP program and answered questions from the participants. SIUC representatives provided an overview of Hazus-MH, described the timeline and the process of the mitigation planning project, and presented Fulton County with a Memorandum of Understanding (MOU) for sharing data and information.

The Fulton County Multi-Hazard Mitigation Planning Committee met on February 4, 2010, July 29, 2010, September, 21, 2010, March 4, 2011 and April 11, 2011. Each meeting was approximately two hours in length. The meeting minutes are included in Appendix A. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

In addition to the five planning team meetings, Chris Helle held public and individual meetings with several Fulton County jurisdictions. The additional meetings were held because several jurisdiction representatives were not able to make the regularly scheduled SIUC-planning process meetings. The attendance sheets from these meetings are listed in Appendix A.

### 2.3 Public Involvement

An effort was made to solicit public input during the planning process, and a public meeting (Meeting #3) was held on September 21, 2010 to review the county's risk assessment. Appendix A contains the minutes from the public meeting. Appendix B contains press releases sent to local newspaper throughout the public input process.

### 2.4 Neighboring Community Involvement

The Fulton County planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The team also invited participation from adjacent counties to obtain their involvement in the planning process. Details of neighboring stakeholders' involvement are summarized in Table 2-2.

**Table 2-2:** Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Title/Organization	Participation Description
Tom Simkins	Knox County	EMA Director, Knox County	Reviewed plan; offered comments
Bill Nowlin	Tazewell County	Tazewell County ESDA	Reviewed plan; offered comments
Vicky Turner	Peoria County	Chairperson, Peoria County LEPC	Reviewed plan; offered comments
Greg Griffin	Mason County	Mason County LEPC	Reviewed plan; offered comments
Rich Utter	Schuyler County	ESDA Coordinator, Schuyler County	Reviewed plan; offered comments
Dan Kreps	McDonough County	ESDA Director, McDonough County	Reviewed plan; offered comments

Aaron Winski	Warren County	Warren County ESDA	Reviewed plan; offered comments
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## 2.5 Review of Technical and Fiscal Resources

The mitigation planning team has identified representatives from key agencies to assist in the planning process. Technical data, reports, and studies were obtained from these agencies. The organizations and their contributions are summarized in Table 2-3.

**Table 2-3: Key Agency Resources Provided**

Agency Name	Resources Provided
Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps
U.S. Census	County Profile Information, e.g., Population and Physical Characteristics
Department of Commerce and Economic Opportunity	Community Profiles
Illinois Department of Employment Security	Industrial Employment by Sector
NOAA National Climatic Data Center	Climate Data
Illinois Emergency Management Agency	2010 Illinois Natural Hazard Mitigation Plan
Illinois Water Survey (State Climatologist Office)	Climate Data
Headwaters Economics & The Bureau of Land Management	A Socioeconomic Profile – Fulton County, IL

## 2.6 Review of Existing Plans

Fulton County and its local communities utilized a variety of planning documents to direct community development. These documents include land use plans, comprehensive plans, emergency response plans, municipal ordinances, and building codes. The planning process also incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 2-4 lists the plans, studies, reports, and ordinances used in the development of the plan.

**Table 2-4: Planning Documents Used for MHMP Planning Processes**

Author(s)	Year	Title	Description	Where Used
FEMA	2009	Fulton County Flood Insurance Study	Describes the NFIP program, which communities participates; provide flood maps	Sections 4 and 5
Supervisor of Assessments	2009	GIS Database	Parcel and Assessor Data For Fulton County.	Section 4
State of Illinois Emergency Management Agency	2010	2010 Illinois Natural Hazard Mitigation Plan	This plan provides an overview of the process for identifying and mitigating natural hazards in Illinois as require by the Disaster Mitigation Act of 2000.	Guidance on hazards and mitigation measures and background on historical disasters in Illinois.

## 2.7 Jurisdiction Participation information

It is intended that this plan meet the requirements of the DMA 2000 and that each incorporated jurisdiction adopt it. The incorporated communities included in this multi-jurisdictional plan are listed in Table 2-5.

**Table 2-5:** Participating Jurisdictions

Jurisdiction Name
Fulton County
Village of Astoria
Village of Avon
City of Canton
Village of Ellisville
City of Farmington
Village of Ipava
Village of Smithfield

## 2.8 Adoption by Local Governing Body

The draft plan was made available on April 11, 2011 to the planning team for review. Comments were then accepted. The Fulton County hazard mitigation planning team presented and recommended the plan to the County Commissioners, who adopted it on <date adopted>. Resolution adoptions are included in Appendix C of this plan.

## 2.9 Jurisdiction Participation

It is required that each jurisdiction participate in the planning process. These jurisdictions participated in meetings with Chris Helle outside of the regularly schedule meetings with SIUC. Table 2-6 lists each jurisdiction and describes its participation in the construction of this plan.

**Table 2-6:** Participating Jurisdictions

INCORPORATED MUNICIPALITIES		
Jurisdiction Name	Participating Member	Participation Description
Fulton County	Rex Lewis	Reviewed plan; attended meetings; offered comments
Village of Astoria	Steve Branson	Reviewed plan; attended meetings; offered comments
Village of Avon	Terry Mingus	Reviewed plan; attended meetings; offered comments
Village of Banner		

INCORPORATED MUNICIPALITIES		
Jurisdiction Name	Participating Member	Participation Description
Village of Bryant		
City of Canton	Kevin Meade	Reviewed plan; attended meetings; offered comments
City of Cuba		
Village of Dunfermline		
Village of Ellisville	Bill Vantine	Reviewed plan; attended meetings; offered comments
Village of Fairview		
City of Farmington	Bud Stobauch	Reviewed plan; attended meetings; offered comments
Village of Ipava	Steve Brunson	Reviewed plan; attended meetings; offered comments
City of Lewistown		
Village of Liverpool		
Village of London Mills		
Village of Marietta		
Village of Norris		
Village of St. David		
Village of Smithfield	L. Jennings	Reviewed plan; attended meetings; offered comments
Village of Table Grove		
Village of Vermont		
OTHER COUNTY JURISDICTIONS		
Jurisdiction Name	Participating Member	Participation Description
OSF Saint Francis/RMERT	Kevin DelMastro	Reviewed plan; attended meetings; offered comments
Canton Police Department	Rick Nicholas	Reviewed plan; attended meetings; offered comments
American Red Cross	Jane Brewer	Reviewed plan; attended meetings; offered comments
Canton ESDA	Phil Fleming	Reviewed plan; attended meetings; offered comments
Fulton County Health Department	Gordon James	Reviewed plan; attended meetings; offered comments
Canton Fire Department	Tom Shubert	Reviewed plan; attended meetings; offered comments
Graham Hospital/LEPC	Michelle Florea/Sherry Cut	Reviewed plan; attended meetings; offered comments

INCORPORATED MUNICIPALITIES		
Jurisdiction Name	Participating Member	Participation Description
ROE 22	Dave Demler	Reviewed plan; attended meetings; offered comments
FCSO	Barry Blackwell	Reviewed plan; attended meetings; offered comments
Putman Township	Allan Woodruff	Reviewed plan; attended meetings; offered comments
Bernadotte Township	Ivan B.	Reviewed plan; attended meetings; offered comments
Banner Township	Richard Ball	Reviewed plan; attended meetings; offered comments
Orion Township	Rod Crowe	Reviewed plan; attended meetings; offered comments
Cass Township	Robert E. Chomer	Reviewed plan; attended meetings; offered comments
Vermont Township	S. Kridel	Reviewed plan; attended meetings; offered comments
Fulton County Highway Department	Bill Kuhn	Reviewed plan; attended meetings; offered comments
Spoon River Valley Fire Association	Jim Tunney	Reviewed plan; attended meetings; offered comments
Ameren Duck Creek (Owners/Operators of Regulated Facilities)	John Mansker	Reviewed plan; attended meetings; offered comments

All members of the mitigation planning team were actively involved in attending the MHMP meetings, providing available Geographic Information Systems (GIS) data and historical hazard information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and coordinating the county’s formal adoption of the plan.

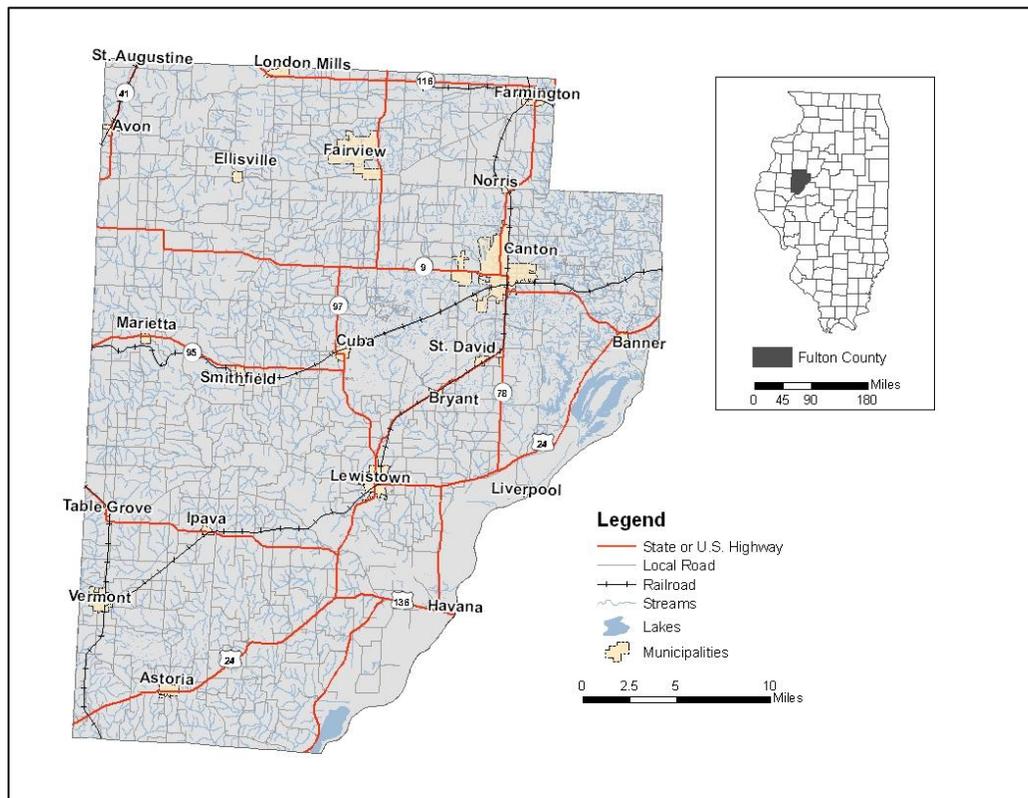
## Section 3 County Profile

### 3.1 County Background

Fulton County is located in west-central Illinois. The county has total land area of 883 square miles. It is bordered by Knox County in the north, Peoria County in the northeast, Tazewell County in the east, Mason County in the south, Schuyler County in the southwest, McDonough County in the west, and Warren County in the northwest. Figure 3-1 depicts Fulton County's location.

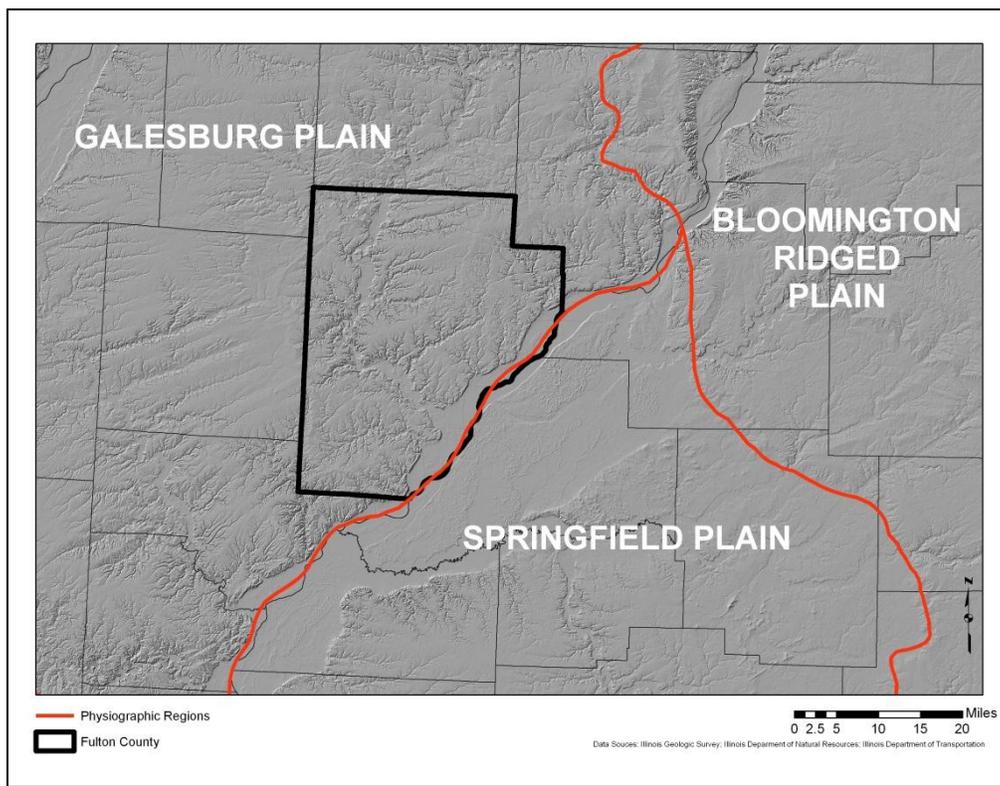
Fulton County was named after Robert Fulton who was an inventor. Fulton's most famous invention was the Clermont, a steamboat, which sailed on the Hudson River in 1807. At the time of its formation in 1823, Fulton County included the majority of Illinois north of the Illinois River, including the current site of Chicago, IL. It acquired its present boundaries in 1825 as new counties were formed from it. The City of Lewistown is the county seat.

Figure 3-1: Fulton County's Geographical Location



### 3.2 Topography

Fulton County is situated in the Central Lowland Province of the Till Plains Section and lies within the Galesburg Plain physiographic division. Part of county's southeastern border is defined by the Illinois River. The physiographic regions are seen in Figure 3-2.

**Figure 3-2:** Physiographic Divisions of Fulton County and the Surrounding Region

### 3.3 Climate

Fulton County climate is typical of Central Illinois. The variables of temperature, precipitation, and snowfall can vary greatly from one year to the next. Winter temperatures can fall below freezing starting as early as September and extending as late as May. Based on National Climatic Data Center (NCDC), normals from 1971 to 2000 for Galesburg, which is the closest city with available temperature data, the average winter low is 13.5° F and the average winter high is 35.1° F. In summer, the average low is 60.3° F and average high is 84.5° F. In Canton, average annual precipitation is 39.85 inches throughout the year.

### 3.4 Demographics

Fulton County has a population of 38,250. According to American FactFinder (2008), Fulton County experienced a population decline of 4.0%. The population is spread throughout 26 townships: Astoria, Banner, Bernadotte, Buckheart, Canton, Cass, Deerfield, Ellisville, Fairview, Farmers, Farmington, Harris, Isabel, Joshua, Kerton, Lee, Lewistown, Liverpool, Orion, Pleasant, Putman, Union, Vermont, Waterford, Woodland, and Young Hickory. The largest community in Fulton County is Canton, which has a population of approximately 15,288. The breakdown of population by township is included in Table 3-1. Townships containing incorporated communities are marked with an asterisk (\*).

**Table 3-1: Population by Township**

<b>Township</b>	<b>2000 Population</b>	<b>Percent of County</b>
Astoria*	1,517	3.97
Banner*	370	0.97
Bernadotte	306	0.80
Buckheart*	1,515	3.96
Canton*	16,075	42.03
Cass*	642	1.68
Deerfield	313	0.82
Ellisville*	178	0.47
Fairview*	708	1.85
Farmers*	400	1.05
Farmington*	3,358	8.78
Harris*	410	1.07
Isabel	206	0.54
Joshua	529	1.38
Kerton	144	0.38
Lee	257	0.67
Lewistown*	3,151	8.24
Liverpool*	664	1.74
Orion	1,003	2.62
Pleasant*	809	2.12
Putnam*	2,198	5.75
Union*	1,132	2.96
Vermont*	1,035	2.71
Waterford	188	0.49
Woodland	423	1.11
Young Hickory*	719	1.88

### 3.5 Economy

American FactFinder reported for 2000 that 76.0% of the workforce in Fulton County was employed in the private sector. The breakdown is included in Table 3-2. Education, health, and social services represent the largest sector, employing approximately 22.8% of the workforce. The 2008 annual per capita income in Fulton County is \$20,367.

**Table 3-2: Industrial Employment Sector**

Industrial Sector	% Distribution in County 2008
Agriculture, forestry, fishing, hunting, and mining	4.1
Construction	8.2
Manufacturing	12.5
Wholesale trade	3.7
Retail trade	12.3
Transportation, warehousing and utilities	6.3
Information	2.1
Finance, insurance, real estate, and rental/leasing	4.0
Professional, technical services	5.2
Educational, health, and social services	22.8
Arts, entertainment, recreation	8.7
Other services	4.6
Public administration	5.7

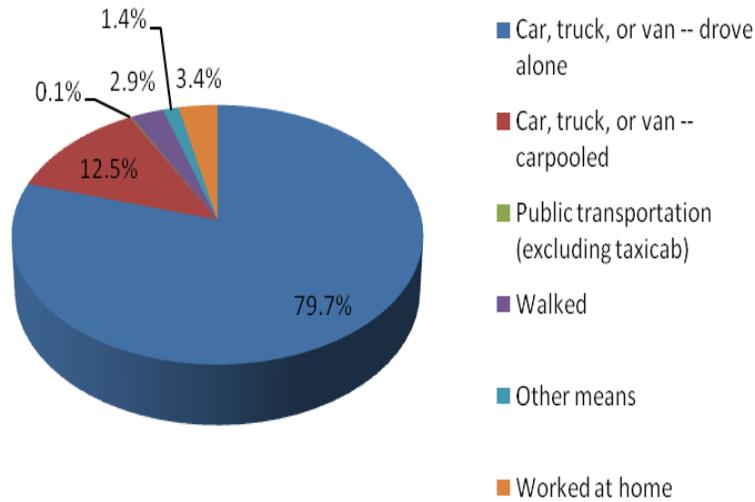
### 3.6 Industry

Fulton County's major employers include the County Government, Fulton County Health Department, Graham Hospital, the school districts of Fulton County and several other local businesses.

### 3.7 Commuter Patterns

According to American FactFinder information from 2008, approximately 17,264 of Fulton County's population are in the work force. The average travel time from home to work is 27.8 minutes. Figure 3-3 depicts the commuting patterns for Fulton County's labor force.

**Figure 3-3: Commuter Patterns for Fulton County**



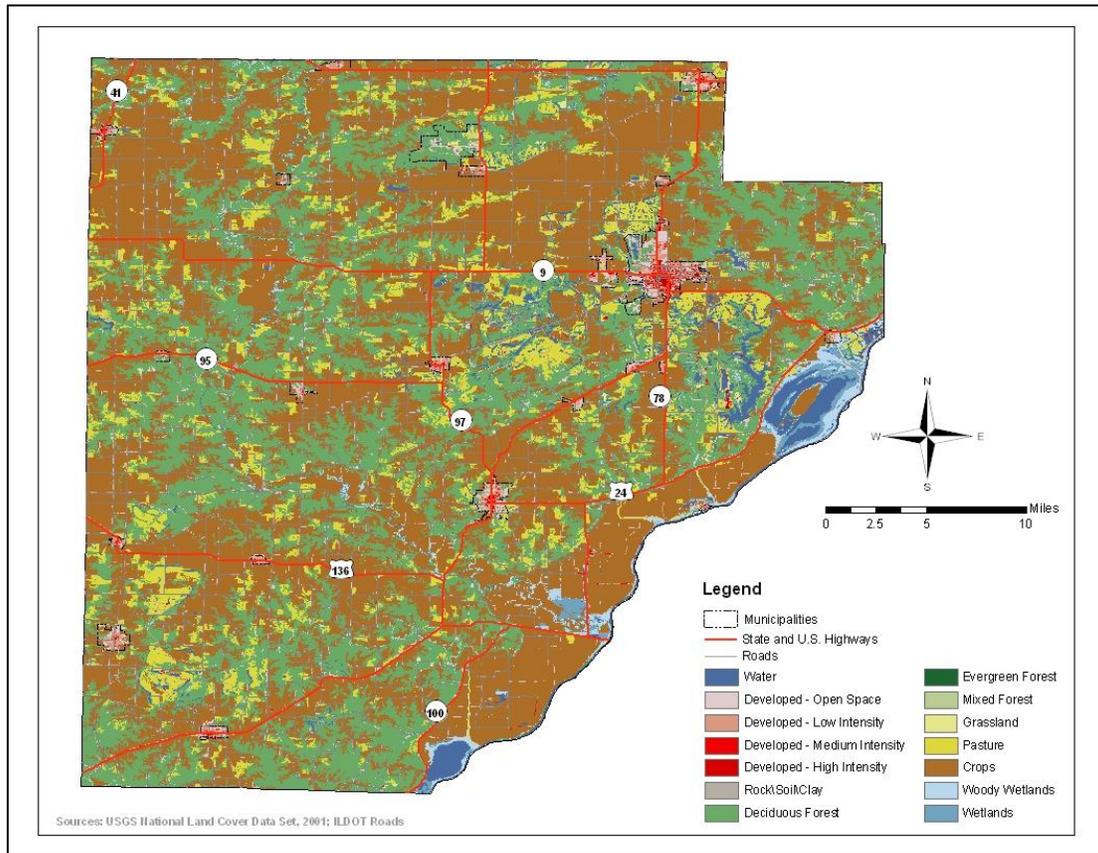
**3.8 Land Use and Development Trends**

Agriculture is the predominant land use in Fulton County. Other significant land uses include tourism, manufacturing, and residential (Figure 3-4). Fulton County is home to several spacious parks for fishing, camping, hiking, and water sports. The parks include Mount Pisgah County Park, Dickson Mounds State Park, Izaak Walton Park, Copperas Creek Management Area, Rice Lake State Conservation Area, Carlson Lake Waterfowl Management Area, Hulit Park, Harper – Rector Woods Nature Preserve, and Anderson Lake State Conservation Area. Development trends in Fulton County are not expected to change significantly in the coming years. Population is expected to remain similar or decline slightly.



*Wood ducks are popular waterfowl in the Emiquon National Wildlife Refuge*

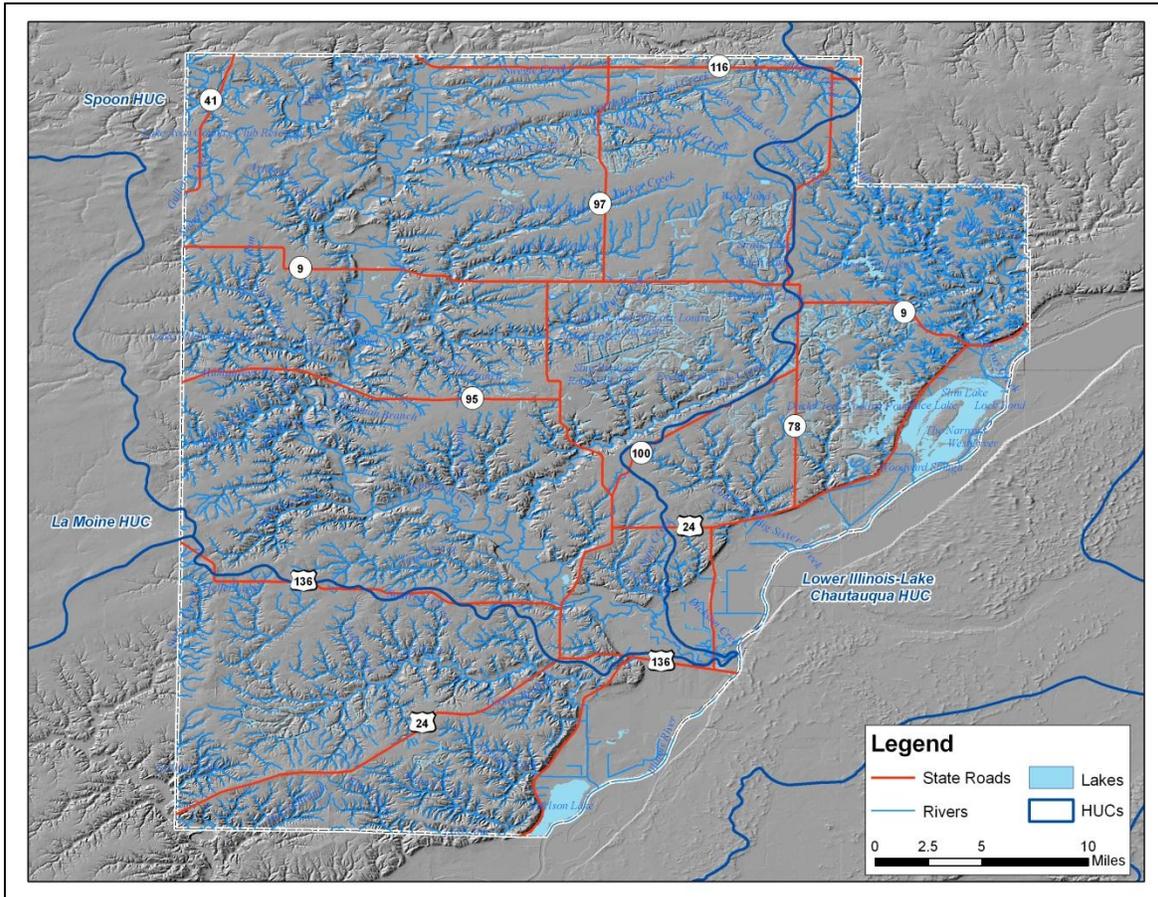
Figure 3-4: Land Use in Fulton County



### 3.9 Major Lakes, Rivers and Watersheds

Fulton County has a number of bodies of water including Anderson Lake, Avondale Lake, Lake Canton, Carlson Lake, Fisher Lake, Fitch Lake, Freshwater Lake, Goose Lake, Little Sister Lake, Lock Pond, Lost Lake, Miserable Lake, Pond Lily Lake, Slim Lake, Strode Lake, Wolf Pond and Woods Lake (among others). Fulton County is bordered by the Illinois River, and Spoon River flows through the county spilling into the Illinois River. According to the USGS, Fulton County consists of three drainage basins: Spoon, La Moine, and Lower Illinois-Lake Chautauqua. Figure 3-5 depicts Illinois hydrologic units.

Figure 3-5: Major Lakes and Rivers in Fulton County



## Section 4 Risk Assessment

The goal of mitigation is to reduce future hazard impacts including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on rigorous risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people. This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected; and the impact on community assets. A risk assessment consists of three components—hazard identification, vulnerability analysis, and risk analysis.

### 4.1 Hazard Identification

#### 4.1.1 Existing Plans

The plans identified in Table 2-4 did not contain a risk analysis. These local planning documents were reviewed to identify historical hazards and help identify risk. To facilitate the planning process, FEMA Digital Flood Rate Insurance Maps (DFIRMs) and other Federal and State flood data were used for flood analysis.

#### 4.1.2 National Hazard Records

##### 4.1.2.1 National Climatic Data Center (NCDC) Records

To assist the planning team, historical storm event data were compiled from the National Climatic Data Center (NCDC). NCDC records are estimates of damage reported to the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events.

The NCDC data included 378 reported events in Fulton County from 1955-2009 (the most updated information as of the date of this plan). A summary table of events related to each hazard type is included in the hazard profile sections that follow. Full details of individual hazard events are on the [NCDC website](#). In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC-recorded latitudes and longitudes. These events are included on the map in Appendix D. The list of NCDC hazards is included in Table 4-1.

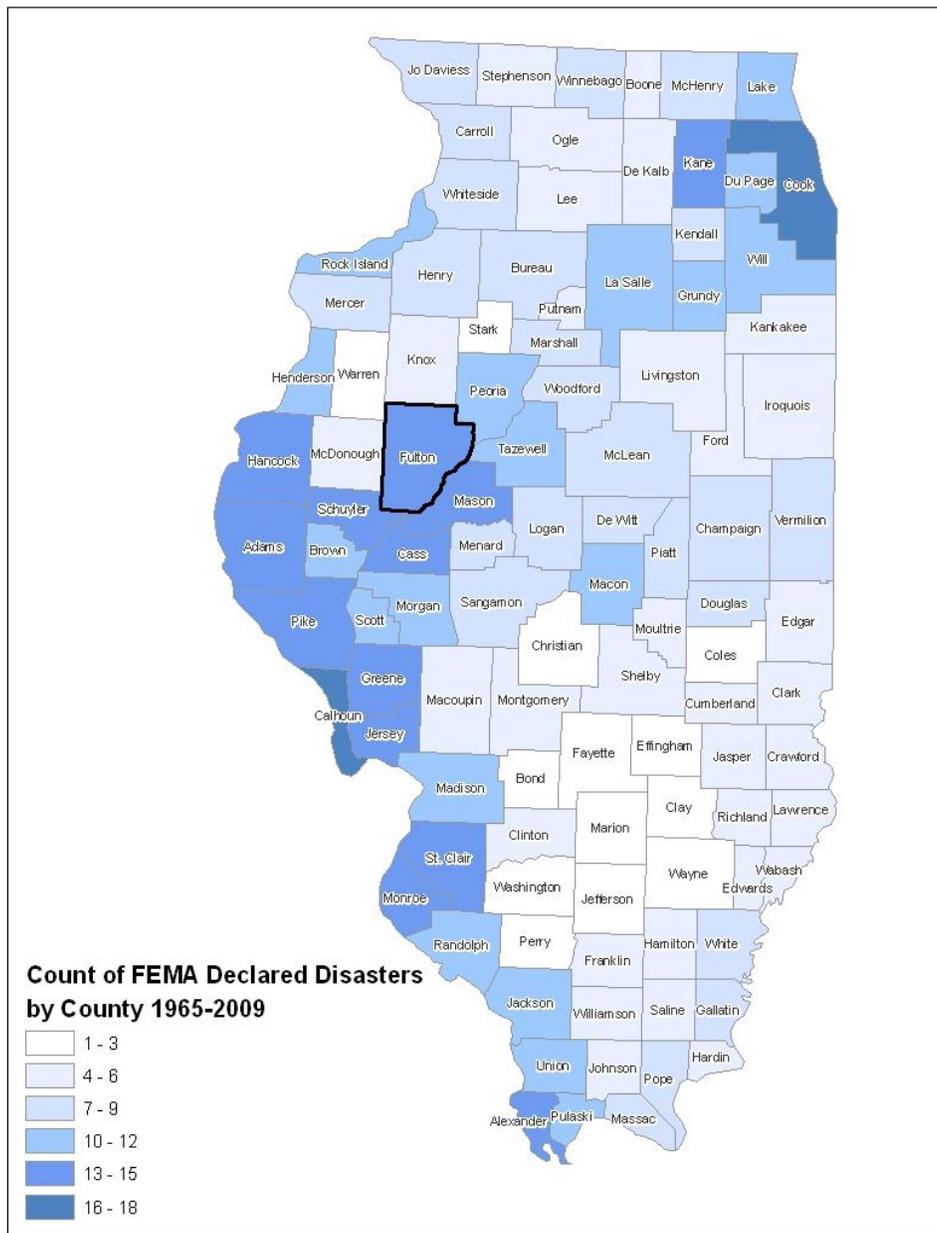
**Table 4-1:** NCDC Historical Hazards

Hazard
Tornadoes
Severe Thunderstorms
Drought/Extreme Heat
Winter Storms
Flood/Flash flood

**4.1.2.2 FEMA Disaster Information**

Since 1965, FEMA has declared 55 disasters for the State of Illinois. Emergency declarations allow states access to FEMA funds for Public Assistance (PA); disaster declarations allow for even more PA funding including Individual Assistance (IA) and the Hazard Mitigation Grant Program (HMGP). Fulton County has received federal aid for nine declared disasters since 1965. Figure 4-1 depicts the disasters and emergencies that have been declared for Fulton County since 1965. Table 4-2 lists more specific information for each declaration.

**Figure 4-1: FEMA-Declared Emergencies and Disasters in Fulton County (1965-2)**



**Table 4-2:** Details of FEMA-Declared Emergencies and Disasters in Fulton County (1965-present)

Event Date	Declaration Number	Date of Declaration	Description
	373	4/27/1973	Severe Storms, Flooding
	438	6/10/1974	Severe Storms, Flooding
	478	7/25/1975	Tornado
	583	1/16/1979	Severe Storms, Flooding
12/2/1982	674	12/10/1982	Severe weather, Flooding
2/23/1985	735	3/6/1985	Severe Storms, Excessive Rains, River Ice Jams, Floods
9/21/1986	776	10/8/1986	Torrential Rains, Flash Flooding
7/1/1993	997	7/28/1993	Severe Thunderstorms, Torrential Rain, Flash(Aquifer) Flooding
5/13/1995	1053	5/14/1995	Tornadoes, Thunderstorms and Flooding
1/1/1999	3134	1/4/1999	Snow Emergency
12/10/2000	3161	1/5/2001	Snow and severe winter Storms
5/7/2002	1416	5/15/2002	Flooding
5/4/2003	1469	5/15/2003	Tornadoes, Severe Storms, and Flooding

**4.1.3 Hazard Ranking Methodology**

Based on planning team input, national datasets, and existing plans, Table 4-3 lists the hazards Fulton County will address in this multi-hazard mitigation plan. In addition, these hazards ranked the highest based on the Risk Priority Index discussed in section 4.1.4.

**Table 4-3:** Planning Team Hazard List

Hazard
Tornado
Flood
Thunderstorm/Wind/Hail
Hazardous Materials Release
Winter Storms

Hazard
Dam or Levee Failure
Earthquake

#### 4.1.4 Calculating the Risk Priority Index

The first step in determining the Risk Priority Index (RPI) was to have the planning team members generate a list of hazards which have occurred or could potentially hit their community. Next, the planning team members were asked to assign a likelihood rating based on the criteria and methods described in the following table. Table 4-4 displays the probability of the future occurrence ranking. This ranking was based upon previous history and the definition of hazard. Using the definitions given, the likelihood of future events is quantified which results in the classification within one of the four ranges of likelihood.

**Table 4-4:** Future Occurrence Ranking

Probability	Characteristics
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring. (1/1=100%) History of events is greater than 33% likely per year.
3 - Likely	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring. (1/3=33%) History of events is greater than 20% but less than or equal to 33% likely per year.
2 - Possible	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring. (1/5=20%) History of events is greater than 10% but less than or equal to 20% likely per year.
1 - Unlikely	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring. (1/10=10%) History of events is less than or equal to 10% likely per year.

Next, planning team members were asked to consider the potential magnitude/severity of the hazard according to the severity associated with past events of the hazard. Table 4-5 gives four classifications of magnitude/severity.

**Table 4-5: Hazard Magnitude**

Magnitude/Severity	Characteristics
8 - Catastrophic	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 - Critical	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 - Limited	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property is severely damaged.
1 - Negligible	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Finally, the RPI was calculated by multiplying the probability by the magnitude/severity of the hazard. Using these values, the planning team members were then asked to rank the hazards. Table 4-6 identifies the RPI and ranking for each hazard facing Fulton County.

**Table 4-6: Fulton County Hazards (RPI)**

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Flooding	4-Highly Likely	8-Catastrophic	32	1
Tornado	3-Likely	8-Catastrophic	24	2
Dam or Levee Failure	2-Possible	8-Critical	16	3
Thunderstorms	4-Highly Likely	2-Limited	8	4
Winter Storms	3-Likely	2-Limited	6	5
Hazardous Materials Release	2-Possible	2-Limited	4	6
Earthquakes	1-Unlikely	8-Catastrophic	8	7

#### 4.1.5 Jurisdictional Hazard Ranking

Because the jurisdictions in Fulton County differ in their susceptibilities to certain hazards, hazards identified by the planning team were ranked by each individual jurisdiction using the methodology outlined in Section 4.1.3. The SIUC rankings were based on input from the planning team members, available historical data, and the hazard modeling results described within this hazard mitigation plan. During the five-year review of the plan, this table will be updated by the planning team to ensure these jurisdictional rankings accurately reflect each community's assessment of these hazards. Table 4-7 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern).

**Table 4-7: Hazard Rankings by Jurisdiction**

Jurisdiction	Hazard						
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Dam/Levee Failure	Winter Storms
Village of Astoria*	1	4	6	2	4	NA	3
Village of Avon*	2	5	6	3	1	NA	4
Village of Banner*	3	6	7	4	1	2	5
Village of Bryant*	1	4	6	2	5	NA	3
City of Canton	1	4	7	2	5	6	3
City of Cuba*	1	4	6	2	5	NA	3
Village of Dunfermline*	1	4	6	2	5	NA	3
Village of Ellisville*	2	5	6	3	1	NA	4
Village of Fairview*	1	4	6	2	5	NA	3
City of Farmington	1	4	6	2	5	NA	3
Village of Ipava*	1	4	6	2	5	NA	3

Jurisdiction	Hazard						
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Dam/Levee Failure	Winter Storms
City of Lewistown	1	4	6	2	5	NA	3
Village of Liverpool*	3	6	7	4	1	2	5
Village of London Mills*	3	6	7	4	1	2	5
Village of Marietta*	1	4	6	2	5	NA	3
Village of Norris*	1	4	6	2	5	NA	3
Village of St. David*	2	5	6	4	1	NA	3
Village of Smithfield*	1	4	6	2	5	NA	3
Village of Table Grove*	1	4	6	2	5	NA	3
Village of Vermont*	1	4	6	2	5	NA	3

N/A = Not Applicable

\*Hazard ranking for this jurisdiction was completed by SIUC

#### 4.1.6 GIS and Hazus-MH

The third step in this assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. Where possible, the hazards were quantified using GIS analyses and Hazus-MH. This process reflects a Level 2 approach to analyzing hazards as defined for Hazus-MH. The approach involves substitution of selected Hazus-MH default data with local data. This process improves the accuracy of model predictions.

Hazus-MH generates a combination of site-specific and aggregated loss estimates, depending upon the analysis options that are selected and the input that is provided by the user. It is important to note that Hazus-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-

related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project, but are available upon request.

Table 4-8 indicates which hazard risk analyses were completed in GIS, Hazus-MH, or using historical hazard records.

**Table 4-8:** List of risk assessment tools used for each hazard

Hazard	Risk Assessment Tool(s)
Tornado	GIS-based
Winter Storms	Historical Records
Severe Thunderstorm	Historical Records
Flooding	Hazus-MH
Hazmat	GIS-based
Dam or Levee Failure	Hazus-MH
Earthquakes	Hazus-MH

## 4.2 Vulnerability Assessment

### 4.2.1 Asset Inventory

#### 4.2.1.1 Processes and Sources for Identifying Assets

The Hazus-MH data is based on the best available national data sources. The initial step involved updating the default Hazus -MH data using State of Illinois data sources. At Meeting 1, the planning team members were provided with a plot and report of all Hazus -MH critical facilities. The planning team took GIS data provided by SIUC, verified the datasets using local knowledge, and allowed SIUC to use their local GIS data for additional verification. SIUC GIS analysts made these updates and corrections to the Hazus -MH data tables prior to performing the risk assessment. These changes to the Hazus -MH inventory contribute to a Level 2 analysis, which improved the accuracy of the model predictions.

The default Hazus -MH data have been updated as follows:

- The Hazus -MH defaults, critical facilities, and essential facilities have been updated based on the most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject-matter experts.

- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) have been applied to the Hazus -MH model data. Hazus -MH reports of essential facility losses reflect updated data.

The following assumptions were made during the analysis:

- The building exposure for flooding, tornado, and HAZMAT is determined from the aggregate Hazus -MH data. We assume that the aggregate data is an accurate representation of the modern landscape of Fulton County.
- The building exposure for earthquake used Hazus -MH default data.
- The analysis is restricted to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.

**4.2.1.2 Essential Facilities List**

Table 4-9 identifies the essential facilities that were added or updated for the analysis. Essential facilities are a subset of critical facilities. A map and list of all critical facilities is included as Appendices E and F.

**Table 4-9: Essential Facilities**

Facility	Number of Facilities
Care Facilities	18
Emergency Operations Centers	4
Fire Stations	20
Police Stations	6
Schools	30

**4.2.1.3 Facility Replacement Costs**

Facility replacement costs and total building exposure are identified in Table 4-10. The replacement costs have not been updated by local data. Table 4-10 also includes the estimated number of buildings within each occupancy class.

**Table 4-10: Building Exposure**

General Occupancy	Estimated Total Buildings	Total Building Exposure (x 1000)
Residential	18,422	\$1,934,125
Agriculture	239	\$42,991
Commercial	685	\$279,987
Education	29	\$59,071
Government	53	\$26,709
Religion	89	\$60,831
Industrial	147	\$42,644
Total	19,664	2,446,358

### 4.3 Future Development

As the county's population grows, the residential and urban areas will extend further into the county, placing more pressure on existing transportation and utility infrastructure while increasing the rate of farmland conversion; Fulton County will address specific mitigation strategies in Section 5 to alleviate such issues.

Because Fulton County is vulnerable to a variety of natural and technological threats, the county government—in partnership with state government—must make a commitment to prepare for the management of these types of events. Fulton County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

### 4.4 Hazard Profiles

#### 4.4.1 Tornado Hazard

##### ***Hazard Definition***

Tornadoes pose a proven and substantial risk to Illinois and its citizens. Tornadoes can occur at any time during the day or night. They can happen during any month of the year. The unpredictability of tornadoes makes them one of the state's most dangerous hazards. Tornado winds are violently destructive when they touch down in developed and populated areas. Current estimates place maximum wind velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour will result in a pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. The Fujita scale ranges from intensity F0, with effective wind speeds of 40 to 70 miles per hour, to F5 tornadoes, with effective wind speeds of over 260 miles per hour. The Fujita intensity scale is described in Table 4-11.

**Table 4-11:** Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
<b>0</b> <i>Gale</i>	40-72 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
<b>1</b> <i>Moderate</i>	73-112 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
2 Significant	113-157 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
3 Severe	158-206 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
4 Devastating	207-260 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
5 Incredible	261-318 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

**Previous Occurrences of Tornadoes**

There have been several occurrences of tornadoes within Fulton County during the past few decades. The NCDC database reported 33 tornadoes/funnel clouds in Fulton County since 1966. The most recent recorded event occurred on May 30, 2003, when a tornado briefly touched down in a field two miles south of St. David.

Fulton County NCDC-recorded tornadoes are identified in Table 4-12. Additional details of individual hazard events can be found on the [NCDC website](#).



FIDLER'S 1 MAY 33 TORNADO



JESSE FIDLER'S 1 MAY 1933 TORNADO

Devastation of the May 1, 1933 tornado

**Table 4-12: NCDC-Recorded Tornadoes in Fulton County**

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	5/23/1966	Tornado	F1	0	0	250	0
Fulton County	3/31/1967	Tornado	F1	0	0	25	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	2/19/1971	Tornado	F1	0	2	250	0
Fulton County	6/18/1973	Tornado	F0	0	0	0	0
Fulton County	10/1/1973	Tornado	F1	0	0	0	0
Fulton County	6/20/1974	Tornado	F0	0	0	0	0
Fulton County	5/26/1975	Tornado	F0	0	0	0	0
Fulton County	6/13/1975	Tornado	F3	0	0	2,500	0
Fulton County	6/24/1975	Tornado	F1	0	0	3	0
Fulton County	7/23/1975	Tornado	F3	2	69	2,750	0
Fulton County	8/11/1976	Tornado	F2	0	1	250	0
Fulton County	4/13/1981	Tornado	F1	0	0	2,500	0
Fulton County	7/25/1981	Tornado	F0	0	0	3	0
Fulton County	3/8/1990	Tornado	F2	0	0	250	0
Fulton County	6/19/1990	Tornado	F2	0	0	250	0
Fulton County	11/27/1990	Tornado	F1	0	0	250	0
Fulton County	4/15/1992	Tornado	F0	0	0	250	0
Cuba	5/9/1995	Tornado	F0	0	0	0	0
Canton	5/9/1995	Tornado	F0	0	0	0	0
Ipava	5/13/1995	Tornado	F4	0	45	6,000	0
Fairview	4/30/1997	Tornado	F1	0	2	450	0
Vermont	4/7/1998	Tornado	F0	0	0	0	0
Sepo	4/7/1998	Tornado	F2	0	0	0	0
Vermont	5/12/1998	Tornado	F0	0	0	0	0
Bryant	5/15/1998	Tornado	F0	0	0	4	0
Marbletown	6/14/1998	Tornado	F0	0	0	0	0
Avon	6/29/1998	Tornado	F1	0	0	15	50
Farmington	6/29/1998	Tornado	F1	0	0	670	0
Marbletown	6/1/1999	Tornado	F0	0	0	0	0
Smithfield	6/12/2002	Tornado	F0	0	0	0	0
Ipava	5/10/2003	Tornado	F1	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Astoria	5/10/2003	Tornado	F1	0	0	0	0
St David	5/30/2003	Tornado	F0	0	0	0	0
<b>Total</b>				<b>2</b>	<b>119</b>	<b>\$16,663</b>	<b>\$50</b>

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

**Geographic Location for Tornado Hazard**

The entire county has the essential same risk for occurrence of tornadoes. They can occur at any location within the county.

**Hazard Extent for Tornado Hazard**

Historical tornadoes generally moved from southwest to northeast across the county. The extent of the hazard varies both in terms of the size of the tornado, its path and the wind speed.

**Risk Identification for Tornado Hazard**

Based on historical information, the probability of future tornadoes in Fulton County is likely. Tornadoes with varying magnitudes are expected to happen. According to the RPI, tornadoes ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

<b>Probability</b>	<b>x</b>	<b>Magnitude /Severity</b>	<b>=</b>	<b>RPI</b>
3	x	8	=	24

**Vulnerability Analysis for Tornado Hazard**

Tornadoes can occur within any area in the county; therefore, the entire county population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan will consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Fulton County are discussed in Table 4-9 and 4-10.

**Critical Facilities**

All critical facilities are vulnerable to tornadoes. A critical facility is susceptible to many of the same impacts as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado but can include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included in Appendices E and F.

## ***Building Inventory***

The building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of building function (e.g., damaged home will no longer be habitable causing residents to seek shelter).

## ***Infrastructure***

During a tornado, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that any number of these structures could become damaged during a tornado. The impacts to these structures include broken, failed, or impassable roadways, broken or failed utility lines (e.g., loss of power or gas to community), and railway failure from broken or impassable rail lines. Bridges could fail or become impassable, causing risk to traffic.

## **GIS-based Tornado Analysis**

One tornado scenario was run for Fulton County through the town of Lewistown. This scenario was selected by the mitigation planning team. The following analysis quantifies the anticipated impacts of tornadoes in the county, in terms of numbers and types of buildings and infrastructure damaged.

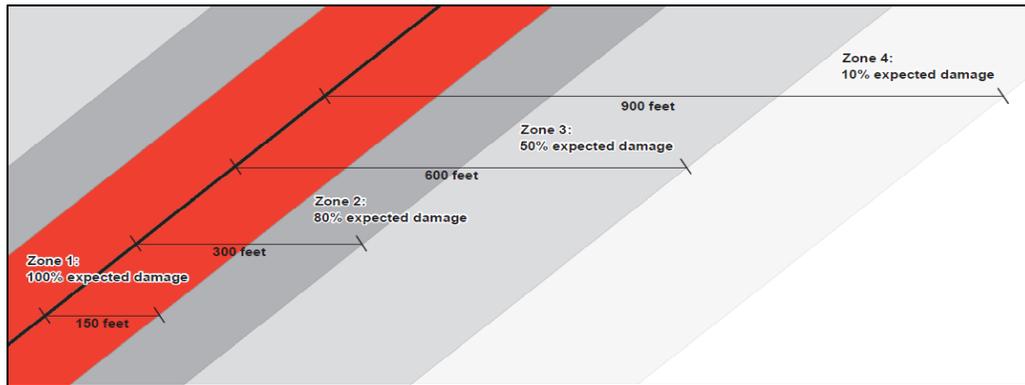
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based upon the F4 tornado event that ran through Lewistown, IL. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 4-13 depicts tornado damage curves as well as path widths (NOAA).

**Table 4-139: Tornado Path Widths and Damage Curves**

<b>Fujita Scale</b>	<b>Path Width (feet)</b>	<b>Maximum Expected Damage</b>
5	2,400	100%
4	1,800	100%
3	1,200	80%
2	600	50%
1	300	10%
0	150	0%

Within any given tornado path, there are degrees of damage depending on proximity. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map, damages were modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 4-2 and Table 4-14 describe the zone analysis. The selected hypothetical tornado path is depicted in Figure 4-3, and the damage curve buffers are shown in Figure 4-4.

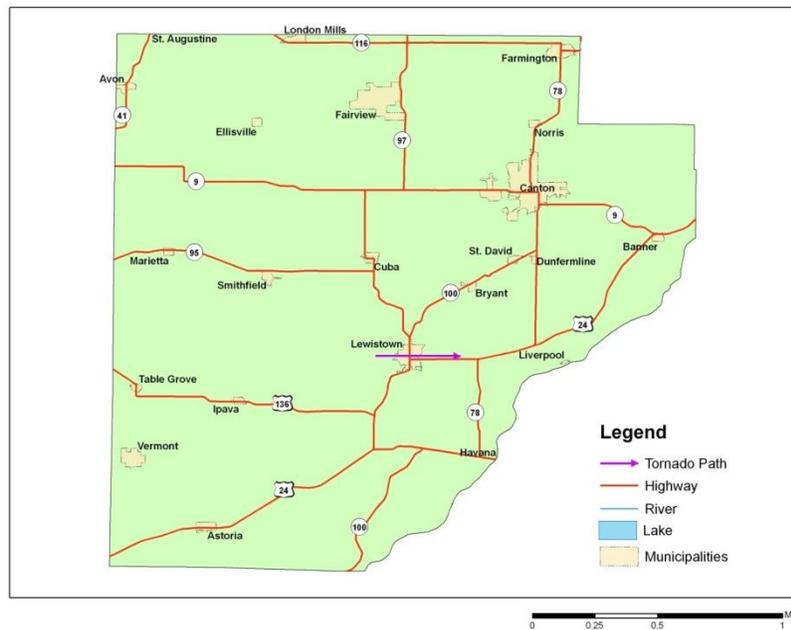
**Figure 4-2: Tornado Analysis (Damage Curves) Using GIS Buffers**



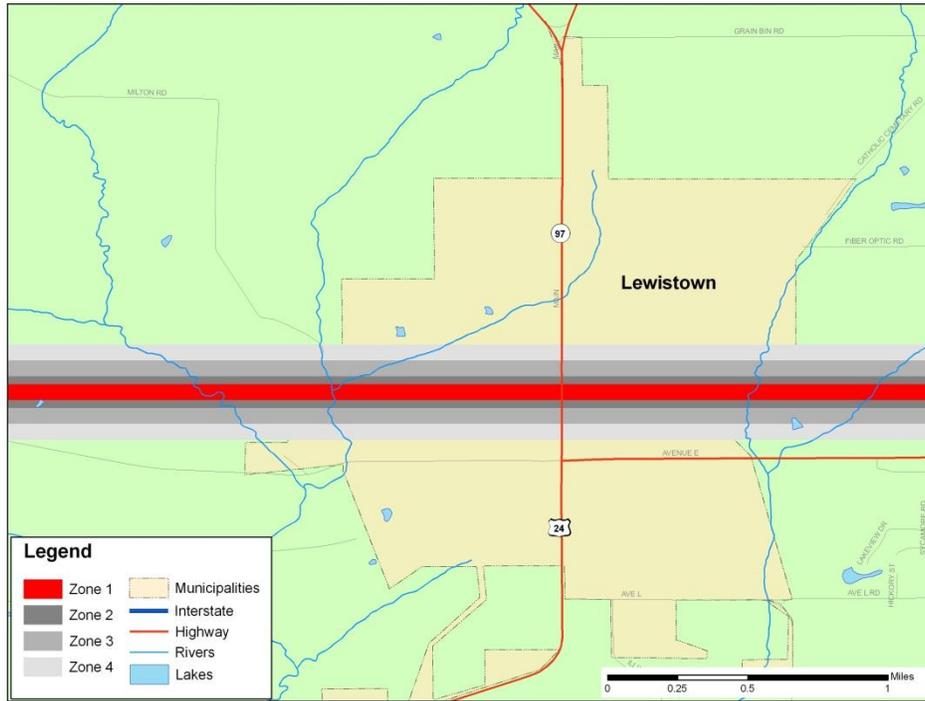
**Table 4-104: F4 Tornado Analysis Using GIS Buffers**

Zone	Buffer (feet)	Damage Curve
1	0-150	100%
2	150-300	80%
3	300-600	50%
4	600-900	10%

**Figure 4-3: Tornado Track through Lewistown, IL**



**Figure 4-4: Modeled F4 Damage Buffers in Lewistown, IL**



**Modeled Impacts of a F4 Tornado in Lewistown, IL**

The results of the analysis are shown in Tables 4-15. The GIS analysis estimates that 1,665 buildings will be damaged. The estimated building losses were over \$37.8 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage.

**Table 4-11: Estimated Building Losses by Occupancy Type (X \$1000)**

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	\$6,846	\$6,001	\$6,520	\$1,926
Commercial	\$2,443	\$2,585	\$1,964	\$109
Industrial	\$711	\$410	\$44	\$16
Agriculture	\$38	\$87	\$61	\$9
Religious	\$1,650	\$1,102	\$161	\$18
Government	\$3,334	\$787	\$715	\$16
Education	\$134	\$120	\$0	\$0
Total	\$15,156	\$11,092	\$9,465	\$2,094

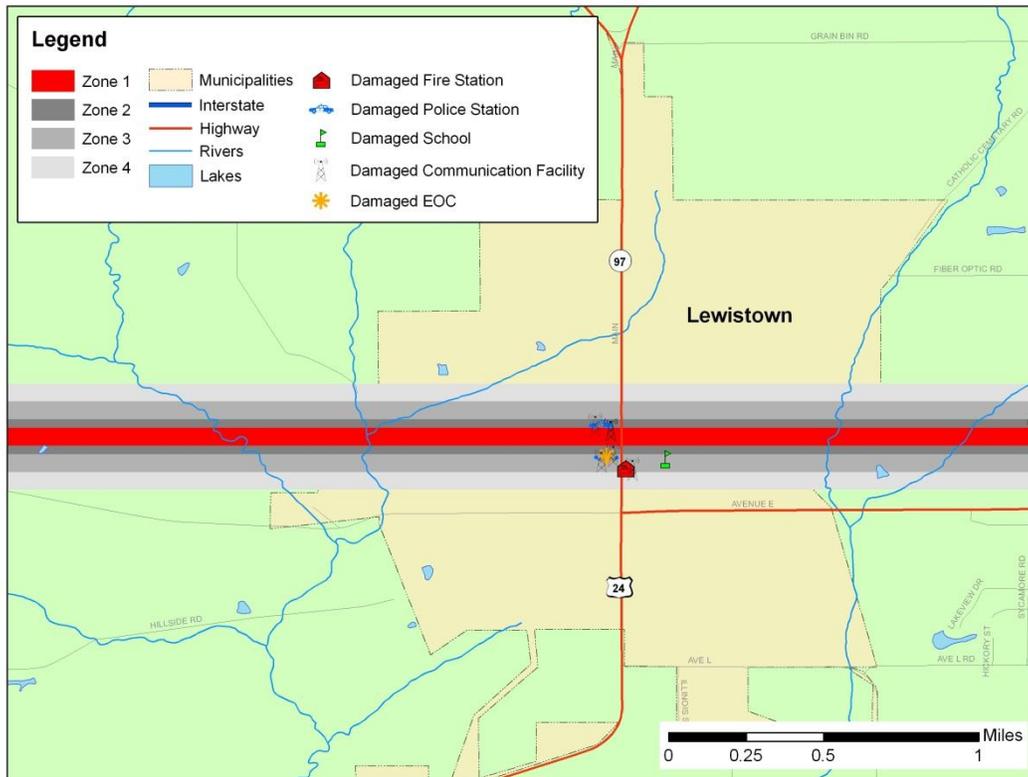
**Critical Facilities Damage**

There are seventeen critical facilities located within 900 feet of the hypothetical tornado path. The affected facilities are identified in Table 4-16, and their geographic locations are shown in Figures 4-5.

**Table 4-16: Critical Facilities Affected by F4 Tornado in Lewistown, IL**

Critical Facility	Facility Name
Emergency Operations Centers	Lewistown ESDA
Fire Stations	Lewistown Fire Protection District
Police Stations	Fulton County Sheriff
	Lewistown Police Department
Schools	New Horizon School

**Figure 4-5: Essential Facilities Affected by the F4 Tornado in Lewistown, IL**



### ***Vulnerability to Future Assets/Infrastructure for Tornado Hazard***

The entire population and all buildings have been identified as at-risk because tornadoes can occur anywhere within the state, at any time of the day, and during any month of the year. Furthermore, any future development in terms of new construction within the county will be at risk. The building exposure for Fulton County is included in Table 4-10.

All critical facilities in the county and communities within the county are at-risk. A map and list of all critical facilities is included as Appendices E and F.

### ***Suggestions for Community Development Trends***

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place can be hardened to lessen the potential impacts of severe weather. Establishment of warning sirens will warn the community of approaching storms to ensure the safety of Fulton County residents.

## **4.4.2 Flood Hazard**

### ***Hazard Definition for Flooding***

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of two types: upstream floods or downstream floods. Both types of floods are common in Illinois.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can result from inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Illinois, but they are most common in the spring and summer months.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage. Riverine flooding on the large rivers of Illinois generally occurs during either the spring or summer.

### **Hazard Definition for Dam and Levee Failure**

Dams are structures that retain or detain water behind a barrier. When full or partially full, the difference in elevation between the water above the dam and below creates large amounts of potential energy, creating the potential for failure. The same potential exists for levees when they serve their purpose, which is to confine flood waters within the channel area of a river and exclude that water from land or communities landward of the levee. Dams and levees can fail due to either 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam or levee fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (of concern would be transportation routes and utility lines required to maintain or protect life), and environmental damage.

Many communities view both dams and levees as permanent and infinitely safe structures. This sense of security may well be false, leading to significantly increased risks. Both downstream of dams and on floodplains protected by levees, security leads to new construction, added infrastructure, and increased population over time. Levees in particular are built to hold back flood waters only up to some maximum level, often the 100-year (1% annual probability) flood event or less. When that maximum is exceeded by more than the design safety margin, the levee will be overtopped or otherwise fail, inundating communities in the land previously protected by that levee. It has been suggested that climate change, land-use shifts, and some forms of river engineering may be increasing the magnitude of large floods and the probability of levee failure situations.

In addition to failure that results from extreme floods above the design capacity, levees and dams can fail due to structural deficiencies. Both dams and levees require constant monitoring and regular maintenance to assure their integrity. Many structures across the U.S. have been under-funded or otherwise neglected, leading to an eventual day of reckoning in the form either of realization that the structure is unsafe or, sometimes, an actual failure. The threat of dam or levee failure may require substantial commitment of time, personnel, and resources. Since dams and levees deteriorate with age, minor issues become larger compounding problems, and the risk of failure increases.

### **Previous Occurrences of Flooding**

The NCDC database reported 35 flood events in Fulton County since 1995. One of the most recent significant events occurred in May 2009 which estimated \$4.0 million in crop damages. Several episodes of heavy rain in mid-May resulted in record river levels on much of the Spoon River. The gauge at London Mills, IL, recorded its third highest crest on record at 25.28 feet. The record flood levels caused three levees along the Spoon River to break, resulting in flooded agricultural areas and grasslands, but there was no property damage reported.



*On July 30th 2010, heavy rains of over four inches fell in areas of southern Fulton County in about one hour on Wednesday evening, according to Fulton County ESDA Director Chris Helle.*

Fulton County NCDC recorded floods are identified in Table 4-17. Additional details of individual hazard events can be found on the [NCDC website](#).

**Table 4-12: NCDC-Records of Flooding in Fulton County**

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	5/14/1995	Flood	N/A	0	0	400	0
Fulton County	5/16/1995	Flash Flood	N/A	0	0	0	0
Fulton County	6/1/1995	Flood	N/A	0	0	100	0
Fulton County	8/4/1995	Small Stream/urban Flood	N/A	0	0	0	0
Fulton County	2/21/1997	Flood	N/A	0	0	0	0
Fulton County	2/21/1997	Flood	N/A	0	0	0	0
Fulton County	3/1/1997	Flood	N/A	0	0	0	0
Fulton County	1/10/1998	Flood	N/A	0	0	0	0
Fulton County	2/15/1998	Flood	N/A	0	0	0	0
Fulton County	2/27/1998	Flood	N/A	0	0	0	0
Countywide	7/10/2000	Flash Flood	N/A	0	0	0	0
Countywide	5/11/2002	Flash Flood	N/A	0	0	500	0
Fulton County	5/11/2002	Flood	N/A	0	0	0	0
Fulton County	5/12/2002	Flood	N/A	1	0	0	0
Fulton County	6/1/2002	Flood	N/A	0	0	0	0
East Portion	6/11/2002	Flash Flood	N/A	0	0	0	0
Countywide	6/13/2002	Flash Flood	N/A	0	0	0	0
North Portion	8/23/2002	Flash Flood	N/A	0	0	0	0
Fiatt	7/9/2003	Flash Flood	N/A	0	0	0	0
Canton	5/18/2004	Flash Flood	N/A	0	0	0	0
Cuba	5/30/2004	Flash Flood	N/A	0	0	0	0
Lewistown	9/11/2006	Flash Flood	N/A	0	0	0	0
Bernadotte	9/13/2008	Flash Flood	N/A	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Canton	9/13/2008	Flash Flood	N/A	0	0	0	0
Cuba	9/13/2008	Flash Flood	N/A	0	0	35	0
Farmington	9/13/2008	Flash Flood	N/A	0	0	0	0
Cuba	12/27/2008	Flash Flood	N/A	0	0	0	0
Avon	3/10/2009	Flood	N/A	0	0	0	0
Marietta	5/13/2009	Flash Flood	N/A	0	0	0	0
Avon	5/15/2009	Flash Flood	N/A	0	0	0	0
London Mills	5/15/2009	Flash Flood	N/A	0	0	0	0
Brereton	5/15/2009	Flash Flood	N/A	0	0	0	0
Avon	5/15/2009	Flood	N/A	1	0	0	0
Avon	5/16/2009	Flood	N/A	1	0	0	4,000
Lewistown	8/19/2009	Flood	N/A	0	0	0	0
<b>Total</b>				<b>3</b>	<b>0</b>	<b>\$1,035</b>	<b>\$4,000</b>

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

**Previous Occurrences of Dam and Levee Failure**

According to the Fulton County planning team, there are no records or local knowledge of any dam or certified levee failure in the county. A levee breach occurred along the Spoon River in mid-May 2009. No damage occurred due to the levee breach.



*Levee breach along the Spoon River in mid-May 2009.*

**Repetitive Loss Properties**

FEMA defines a repetitive loss structure as a structure covered by a contract of flood insurance issued under the NFIP, which has suffered flood loss damage on two or more occasions during a 10-year period that ends on the date of the second loss, in which the cost to repair the flood damage is  $\geq 25\%$  of the market value of the structure at the time of each flood loss.

The Illinois Emergency Management Agency (IEMA) was contacted to determine the location of repetitive loss structures. Table 4-18 lists 2009 data for damages to these repetitive loss structures.

**Table 4-13: Fulton County Repetitive Loss Structures**

Jurisdiction	Occupancy Type	Number of Structures	Number of Losses
Fulton County	Single Family	13	46
Fulton County	Non Residential	3	15
Village of Liverpool	Single Family	46	146
Village of Liverpool	Non Residential	3	17
Village of Liverpool	ASSMD Condo	1	5
Village of London Mills	Single Family	2	5

### ***Geographic Location for Flooding***

Most river-flooding in Illinois occurs in the spring to early summer and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Severe thunderstorms may cause flooding during the summer or fall, but tend to be localized. The primary source of river flooding in Fulton County is the Illinois River.

Flash floods, brief heavy flows in small streams or normally dry creek beds, also occur within the county.

The DFIRM was used to identify specific stream reaches for analysis. The areas of riverine flooding are depicted on the map in Appendix D.

### ***Geographic Location for Dam and Levee Failure***

Hazus-MH identified 43 dams in Fulton County. Table 4-19 summarizes the dam and levee information. A map of dam and levee location is in Figure 4-6.

**Table 4-14: National Inventory of Dams for Fulton County, IL**

Dam Name	River	Hazard	EAP
Vanwinkle Lake Dam	Tributary Big Creek	H	N
Keystone Anglers Club Lake Dam	Tributary Coal Creek	L	N
Wolf Pond Dam	Big Creek	L	N
Freshwater Lake Dam	Tributary South Branch Otter Creek	L	N
Lake Avon Country Club Reservoir Dam	Tributary Gallett Creek	L	N
Wee Ma Tuk Lake Dam	Put Creek	S	N
Canton City Lake Dam	West Branch Copperas Creek	H	Y

Dam Name	River	Hazard	EAP
Carthage Lake 1 Dam	Tributary Long Creek	S	N
Woods Lake Dam	Put Creek-Offstream	L	N
Truax Lake Dam	Tributary Put Creek	L	N
Msdgc Dam 3	Tributary Evelen Creek	L	N
Msdgc Dam 3	Tributary Slug Run	L	N
Msdgc Dam 9	Slug Run	L	N
Msdgc Dam 5	Tributary Big Creek-Offstream	L	N
Msdgc Dam 6	Tributary Big Creek-Offstream	L	N
Msdgc Dam 8	Slug Run	L	N
Ipava Settling Basin Dam	Francis Creek	L	N
Msdgc Sludge Pond 1-3a Dam	Evelen Branch-Offstream	S	N
Msdgc Dam 5	Tributary Big Sister Creek	L	N
Msdgc Dam 7	Tributary Big Creek	L	N
Duck Creek Waste Area li Dam	Duck Creek	L	N
Sullivan Lake Dam	Tributary Gaines Branch	L	N
Slug Run Lake Dam	Tributary Slug Run Creek	L	N
Road Fill Lake Dam	Tributary Slug Run Creek	L	N
Diversion Drainage Lake Dam	Tributary Otter Creek	L	N
Evelen Lake Dam	Evelen Branch, Big Creek	L	N
Little Sister Lake Dam	Little Sister Creek	L	N
Midland/Rapatee Mine/Slurry Impoundment	Tributary Little Creek	L	N
Traer Lake Dam	Tributary Put Creek	L	N
Long Lake Dam	Put Creek-Offstream	L	N
Lake Marie Dam	Put Creek-Offstream	L	N
Wee-Ma-Tuk-Lake-South Dam	Tributary Put Creek	L	Y
Norris Slurry Pond Dam	Offstream Big Creek	H	N
Grieves Dam	Tributary Illinois River	S	Y
Buckheart Mine No. 17 (Dam 1)		L	N
Buckheart Mine No. 17 (Dam 2)		L	N
Lake Roberts Dam	Cedar Creek	B	N

Dam Name	River	Hazard	EAP
Cbs Gun Club Lake Dam	Turkey Creek	B	N
Sweeney's Pond Dam	Tributary-Shoal Creek	B	N
Darst Pond Dam	Tributary-Shaw Creek-Spoon River	B	N
Heller Pond Dam	Tributary-Otter Creek	B	N
Lake Wildwood Haven	South Fork Shaw Creek	B	N
Maas Dam	Tributary Little Coal Creek	L	N

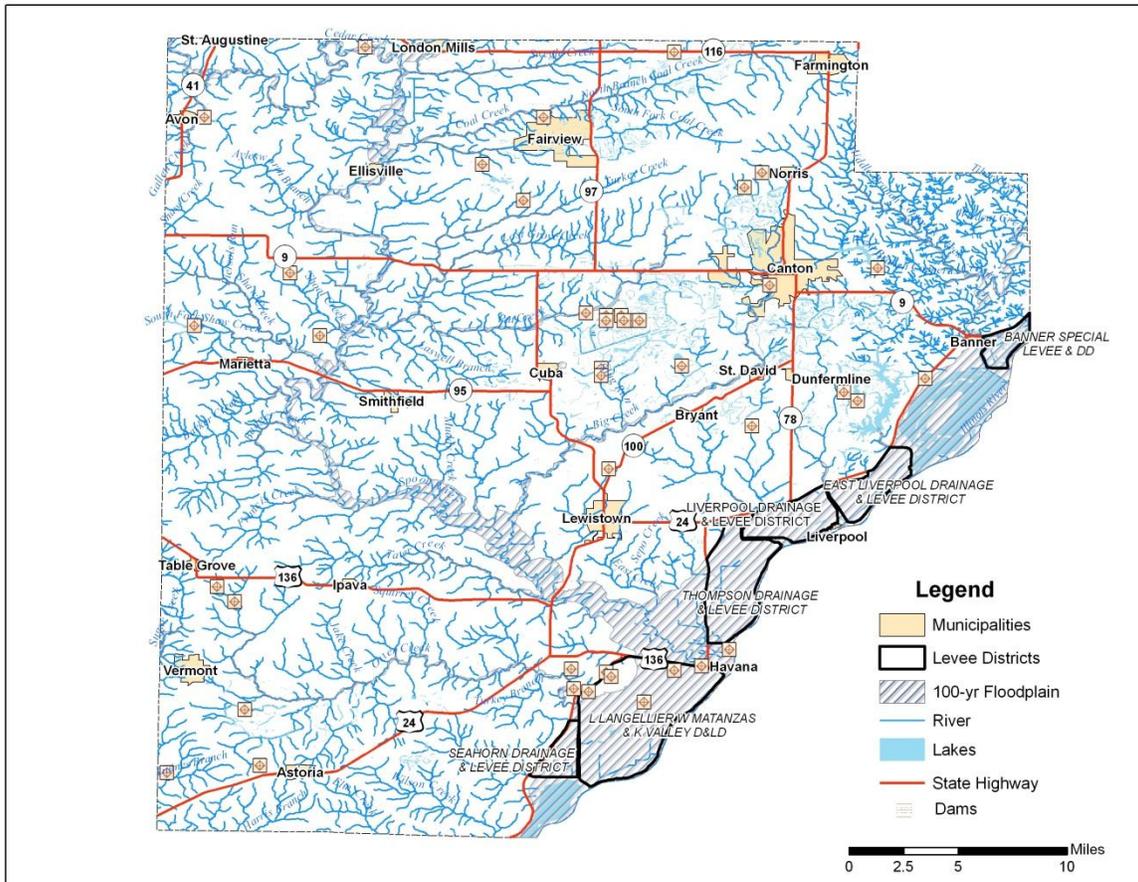
A review of the United States Army Corps of Engineers and local records revealed six levee districts in Fulton County: Banner Special Levee & Drainage District, East Liverpool Drainage & Levee District, Liverpool Drainage & Levee District, Thompson Drainage & Levee District, Seahorn Drainage & Levee District and L Langellier W Matanzas & K Valley Drainage & Levee District. Levee Districts are listed in Table 4-20 and shown in Figure 4-6.

**Table 4-20:** U.S. Army Corps of Engineers and Local Levee and Drainage Districts in Fulton County, IL

Name	River	Sponsorship	Areas Protected (Acres)	Protection Level	Certification	
					PL 84 99 (USACE)	FEMA
Banner Special Levee and Drainage District	Illinois River	Unknown	4,150	Unknown	Yes	No
East Liverpool Drainage and Levee District	Illinois River	East Liverpool Drainage and Levee District	3,000	Unknown	Yes	No
L Langellier W. Matanzas and K Valley Drainage and Levee District	Illinois River	L. Langellier W. Matanzas and K Valley Drainage and Levee District	7,800	Unknown	Yes	No
Lake Chautauqua Wildlife Area	Illinois River	None	1,192	10-year	No	No
Liverpool Drainage and Levee District	Illinois River	Liverpool Drainage and Levee District	3,030	Unknown	Yes	No
Seahorn Drainage and Levee District	Illinois River	Seahorn Drainage and Levee District	1,647	Unknown	Yes	No

Name	River	Sponsorship	Areas Protected (Acres)	Protection Level	Certification	
					PL 84 99 (USACE)	FEMA
Spring Lake Levee and Drainage District	Illinois River	Spring Lake Levee and Drainage District	13,120	100-year	Yes	No
Thompson Drainage and Levee District	Illinois River	Thompson Drainage and Levee District	6,300	Unknown	Yes	No

Figure 4-6: Map of U.S. Army Corps of Engineers and Local Levee and Drainage Districts in Fulton County, IL



**Hazard Extent for Flooding**

The Hazus-MH flood model is designed to generate a flood depth grid and flood boundary polygon by deriving hydrologic and hydraulic information based on user-provided elevation data or by incorporating selected output from other flood models. Hazus-MH also has the ability to clip a Digital Elevation Model (DEM) with a user-provided flood boundary, thus creating a flood depth grid. For Fulton County, Hazus -MH generated a flood-depth grid for the 100-year flood boundary from the Fulton County DFIRM.

Flood hazard scenarios were modeled using GIS analysis and Hazus -MH. The flood hazard modeling was based on historical occurrences and current threats. DFRIM maps were used to identify the areas of study. Planning team input and a review of historical information provided additional information on specific flood events.

### ***Hazard Extent for Dam and Levee Failure***

When dams are assigned the low (L) hazard potential classification, it means that failure or incorrect operation of the dam will result in no human life losses and no economic or environmental losses. Losses are principally limited to the owner's property. Dams assigned the significant (S) hazard classification are those dams in which failure or incorrect operation results in no probable loss of human life; however dam or levee failure can cause economic loss, environment damage, and disruption of lifeline facilities. Dams classified as significant hazard potential dams are often located in predominantly rural or agricultural areas, but could be located in populated areas with a significant amount of infrastructure. Dams assigned the high (H) hazard potential classification are those dams in which failure or incorrect operation has the highest risk to cause loss of human life and significant damage to buildings and infrastructure.

According to Hazus -MH data, three dams in Fulton County are classified as high hazard and two dams have Emergency Action Plans (EAP). An EAP is not required by the State of Illinois but is strongly recommended by the Illinois Department of Natural Resources.

Accurate mapping of the risks of flooding behind levees depends on knowing the condition and level of protection the levees actually provide. FEMA and the U.S. Army Corps of Engineers are working together to make sure that flood hazard maps clearly reflect the flood protection capabilities of levees, and that the maps accurately represent the flood risks posed to areas situated behind them. Levee owners—usually states, communities, or in some cases private individuals or organizations—are responsible for ensuring that the levees they own are maintained according to their design. In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove the levee meets design, operation, and maintenance standards for protection against the one-percent-annual chance flood.

### ***Risk Identification for Flood Hazard***

Based on historical information, future occurrence of flooding in Fulton County is highly-likely. According to the Risk Priority Index (RPI), flooding is ranked as the number one hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	8	=	32

### ***Risk Identification for Dam and Levee Failure***

Based on operation and maintenance requirements and local knowledge of the dams and levees in Fulton County, the probability of failure is low to moderate. However, if a high-hazard dam or levee were to fail, the magnitude and severity of the damage could be great. The warning time and duration of the dam or levee

failure event would be very short. According to the RPI, dam and levee failure ranked as the number three hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	8	=	32

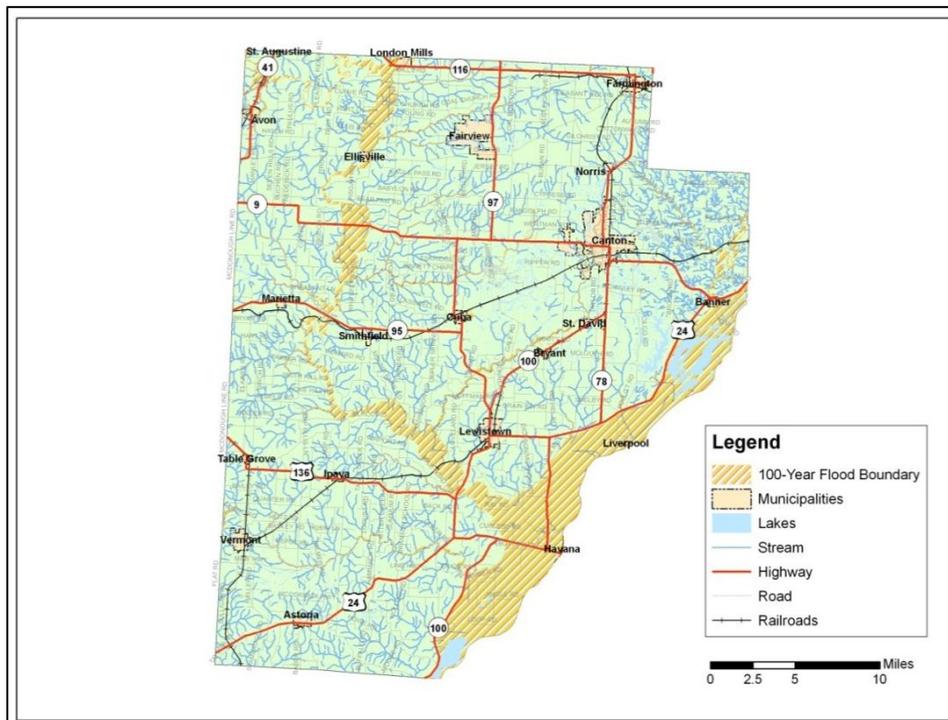
***Hazus-MH Analysis Using 100-Year Flood Boundary and Aggregate Data***

Hazus-MH generated the flood depth grid for a 100-year return period and made calculations by clipping the USGS one-third-arc-second DEM (~10 m) to the flood boundary. Next, Hazus-MH estimated the damages for Fulton County by utilizing default aggregate General Building Stock data.

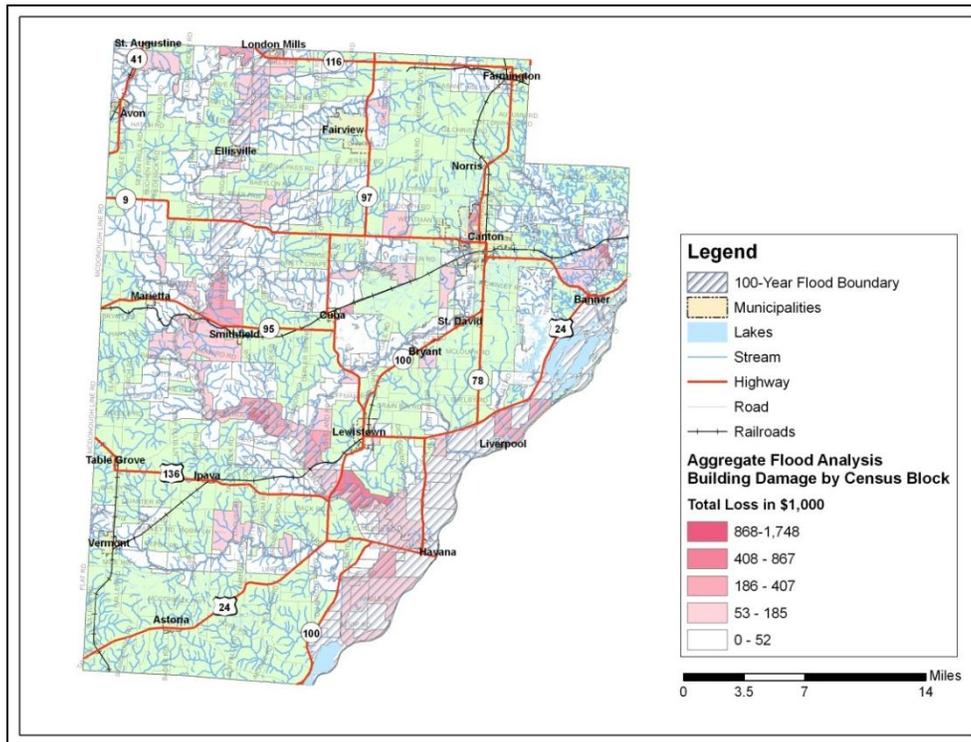
***General Building Stock***

Hazus-MH estimates that the 100-year flood would damage 323 buildings, at a replacement cost of \$30.4 million. Figure 4-7 depicts the flood boundary from the Hazus-MH analysis and Figure 4-8 depicts the damage per census block from the aggregate data that fall within the 100-year floodplain.

**Figure 4-7: Fulton County 100-Year Floodplain Boundary**



**Figure 4-8:** Aggregate Flood Damages by Census Block for Fulton County (100-Year Flood)



**Critical Facilities**

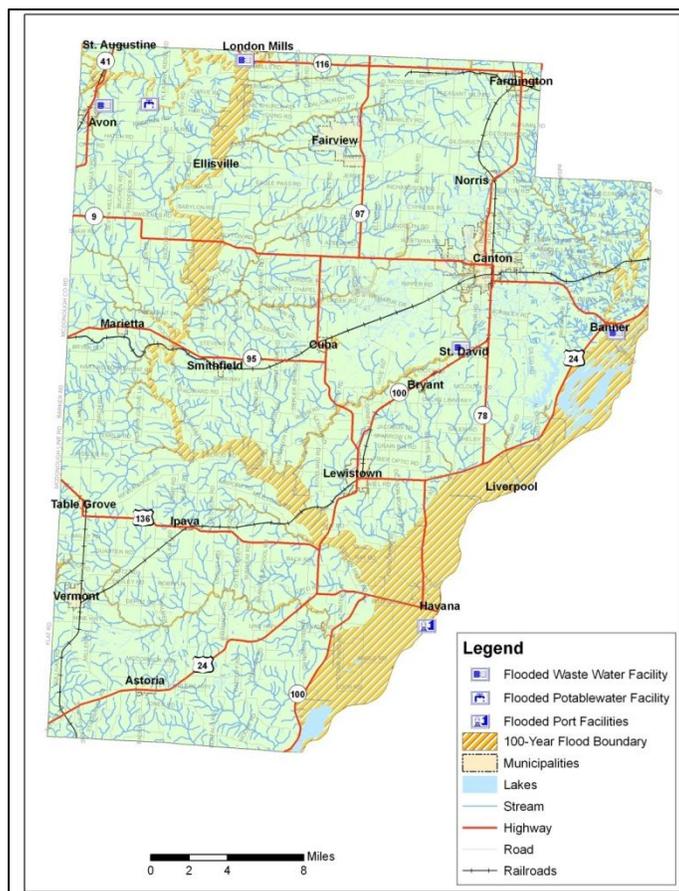
A critical facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). A map and list of all critical facilities is included as Appendices E and F.

The analysis identified six critical facilities that are subject to flooding. The critical facilities are listed in Table 4-21 and the locations of these facilities are shown on Figure 4-9.

**Table 4-21:** List of Affected Critical Facilities for a 100-Year Flood Event

Critical Facility	Facility Name
Water Treatment Facilities	Avon Water Treatment Plant
Waste Water Treatment Facilities	Banner Sewer Treatment Plant
	Avon Sewer Treatment Plant
	London Mills Sewer Treatment Plant (2)
Port Facilities	Jack Tanner Towing Company, Coggeshall Fleet

**Figure 4-9: Map of Affected Critical Facilities by a 100-Year Flood Event**



**Infrastructure**

The types of infrastructure that could be impacted by a flood include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of a flood. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could also fail or become impassable, causing traffic risks.

**Vulnerability Analysis for Flash Flooding**

Flash flooding could affect any low-lying location or areas of poor drainage within this jurisdiction; therefore, a significant portion of county’s population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

A map and list of all critical facilities is included in Appendices E and F.

**Suggestions for Community Development Trends**

Controlling floodplain development is the key to reducing flood-related damages. Areas with recent development within the county may be more vulnerable to drainage issues. Storm drains and sewer

systems are usually most susceptible. Damage to these can cause back-up of water, sewage, and debris into homes and basements, causing structural and mechanical damage as well as creating public health hazards and unsanitary conditions.

### 4.4.3 Earthquake Hazard

#### ***Hazard Definition***

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's crust. For hundreds of millions of years, plate tectonics have shaped the Earth, as the tectonic plates that form the earth's surface move slowly over, under, and past each other. At their edges, the plates become locked together and accumulate energy until they suddenly break free, causing the ground to shake (i.e., an earthquake).

Most earthquakes occur at the boundaries where plates meet; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern and Eastern United States. The most seismically active area in the Midwest is the New Madrid Seismic Zone. Additionally, the Wabash Valley fault system in Illinois and Indiana shows evidence of large earthquakes in its geologic history, and scientists believe there may be other, currently unidentified faults in the Midwest capable of producing strong earthquakes.

Strong earthquakes can collapse buildings and infrastructure, disrupt utilities, and sometimes trigger landslides, avalanches, flash floods, fires, and tsunamis. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage. Additionally, essential facilities, such as fire departments, police departments, and hospitals, may be damaged, disrupting emergency response services in the affected area. Strong earthquakes may also require mass relocation; however, relocation may be impossible in the short-term aftermath of a significant event due to damaged transportation infrastructure and public communication systems.

The magnitude of an earthquake measures the energy released at the earthquake's source. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, structures, and the natural environment. Earthquake magnitudes and their corresponding intensities are listed in Table 4-22.

*Source:* [http://earthquake.usgs.gov/learning/topics/mag\\_vs\\_int.php](http://earthquake.usgs.gov/learning/topics/mag_vs_int.php)

**Table 4-22:** Abbreviated Modified Mercalli Intensity Scale

<b>Mercalli Intensity</b>	<b>Description</b>
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing

Mercalli Intensity	Description
	motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

### ***Previous Occurrences for Earthquakes***

Historically, the most significant seismic activity in Illinois has been associated with New Madrid Seismic Zone. The New Madrid Seismic Zone is attributed with producing three earthquakes large earthquakes in the central U.S., with magnitudes estimated between to be 7.0 and 7.7 on December 16, 1811, January 23, 1812, and February 7, 1812. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment (sand blows) over an area of >10,500 km<sup>2</sup>, and uplift of a 50 km by 23 km zone (the Lake County uplift). The shaking was felt over a total area of over 10 million km<sup>2</sup> (the largest felt area of any historic earthquake). The United States Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimate the probability of a repeat of the 1811-1812 type earthquakes (magnitude 7.5-8.0) is 7%-10% over the next 50 years (USGS Fact Sheet 2006-3125).

In the past few decades, with many precise seismographs positioned across Illinois, measured earthquakes have varied in magnitude from very low microseismic events of M=1-3 to larger events up to M=5.4. The most recent earthquake in northern Illinois—as of the date of this report—occurred on February 10, 2010 about 3.0 km (2 miles) east-northeast of Virgil, IL and measured 3.8 in magnitude. The last earthquake in Illinois to cause minor damage occurred on April 18, 2008 near Mt. Carmel, IL and measured 5.2 in magnitude. Earthquakes resulting in more serious damage have occurred about every 70 to 90 years and have been concentrated in southern Illinois.

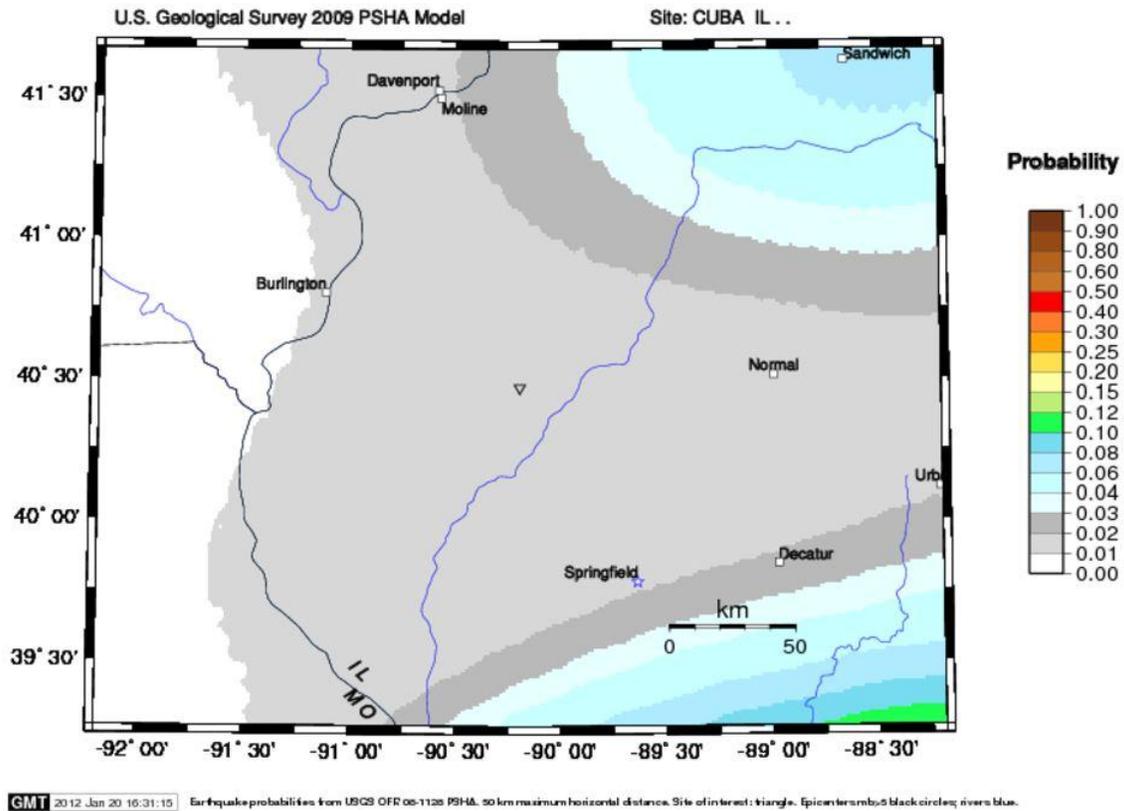
### ***Geographic Location for Earthquake Hazard***

Within Illinois, the two most significant zones of seismic activity are the New Madrid Zone and the Wabash Valley Fault System. There have been no earthquake epicenters recorded in Fulton County. Figure 4-10 depicts the following: a) location of notable earthquakes in Illinois region; b) generalized geologic bedrock map with earthquake epicenters and geologic structures; c) geologic and earthquake epicenter map of



**Figure 4-11: USGS Probability Map of a M5.5 Earthquake Occurring in the Next 500 Years within Fulton County**

Probability of earthquake with M > 5.5 within 500 years & 50 km



**Hazard Extent for Earthquake Hazard**

Earthquake effects are possible anywhere in Fulton County. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. A National Earthquake Hazards Reduction Program (NEHRP) compliant soils map was used for the analysis and was provided by FEMA. The map identifies the soils most susceptible to failure.

**Risk Identification for Earthquake Hazard**

Based on historical information as well as current USGS and SIUC research and studies, future earthquakes in Fulton County are possible but, large (>6.0 M) earthquakes that would cause catastrophic damage are unlikely. Severe to catastrophic earthquake damage is unlikely because of the large distance (>200 miles) between Fulton County and nearest the major seismic zones, the New Madrid Seismic Zone and the Wabash Valley Fault Zone. According to the Fulton County planning team’s assessment, earthquake is ranked as the number seven hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
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2	x	8	=	16
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### ***Vulnerability Analysis for Earthquake Hazard***

Earthquakes could impact the entire jurisdiction equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake. To accommodate this risk, this plan will consider all buildings located within the county as vulnerable.

### ***Critical Facilities***

All critical facilities are vulnerable to earthquakes. A critical facility would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). A map and list of all critical facilities is included as Appendices E and F.

### ***Building Inventory***

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can expect, similar impacts to those discussed for critical facilities. These impacts include structural failure and loss of building function which could result in indirect impacts (e.g., damaged homes will no longer be habitable causing residents to seek shelter).

### ***Infrastructure***

During an earthquake, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to this plan, it is important to emphasize that any number of these items could become damaged in the event of an earthquake. The impacts to these items include broken, failed, or impassable roadways, broken or failed utility lines (e.g., loss of power or gas to community), and railway failure from broken or impassable railways. Bridges could also fail or become impassable causing traffic risks. Typical scenarios are described to gauge the anticipated impacts of earthquakes in the county in terms of numbers and types of buildings and infrastructure.

### ***Hazus-MH Analyses for Two Earthquake Scenarios***

The SIUC-Polis team reviewed existing geological information and recommendations for earthquake scenarios. A deterministic and a probabilistic earthquake scenario were developed to provide a reasonable basis for earthquake planning in Fulton County. The deterministic scenario was a Moment Magnitude of 5.5 with the epicenter located in Fulton County near the City of Cuba. This represents a realistic scenario for planning purposes.

Additionally, the earthquake-loss analysis included a probabilistic scenario based on ground shaking parameters derived from U.S. Geological Survey probabilistic seismic hazard curves for the earthquake with the 500-year return period. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500-year return period. The following earthquake hazard modeling scenarios were performed:

- magnitude earthquake local epicenter (deterministic)

- 500-year return period event (probabilistic)

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information required for accurate assessment of earthquake risk is soils data. Fortunately, a National Earthquake Hazards Reduction Program (NEHRP) soil classification map exists for Illinois. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking. FEMA provided a soils map and liquefaction potential map that is the default in Hazus-MH.

Earthquake hypocenter depths in Illinois range from less than 1.0 to ~25.0 km. The average hypocenter depth, ~10.0 km, was used for the deterministic earthquake scenario. For this scenario type, Hazus-MH also requires the user to define an attenuation function. To maintain consistency with the USGS (2006) modeling of strong ground motion in the central United States, the Toro et al. (1997) attenuation function was used for the deterministic earthquake scenario.

Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

### ***Results for 5.5M Scenario – General Building Stock***

The results of the 5.5 magnitude arbitrary earthquake scenario, with an epicenter a couple of miles south of the City of Cuba, are shown in Tables 4-23 and 4-24 and Figure 4-12. Hazus-MH estimates that approximately 1,761 buildings will be at least moderately damaged. This is more than 9.0% of the total number of buildings in the region. It is estimated that 64 buildings will be damaged beyond repair.

Figure 4-12: 5.5 Magnitude Earthquake Scenario for Fulton County

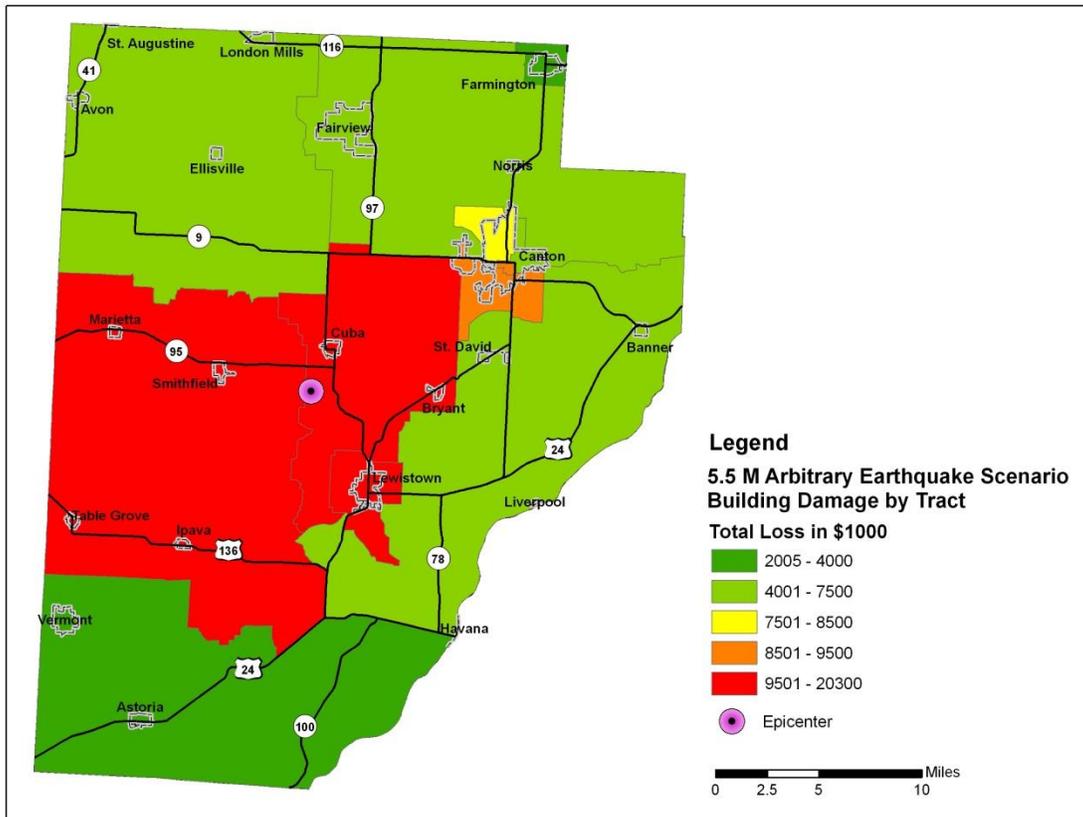


Table 4-23: Building Occupancy for a 5.5 Magnitude Damage Estimates in Fulton County, IL

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	158	1.07	39	1.23	30	2.22	10	3.13	1	2.22
Commercial	468	3.17	116	3.71	75	5.52	22	6.80	3	5.22
Education	20	0.13	5	0.15	3	0.25	1	0.31	0	0.35
Government	36	0.24	9	0.28	6	0.47	2	0.54	0	0.60
Industrial	101	0.68	24	0.78	16	1.18	5	1.44	1	1.00
Other Residential	3,356	22.71	781	24.96	398	29.12	85	25.72	15	23.16
Religion	60	0.40	15	0.48	10	0.74	3	1.05	1	1.02
Single Family	10,578	71.59	2,139	68.41	827	60.50	202	61.01	43	66.43
<b>Total</b>	<b>14,776</b>		<b>3,127</b>		<b>1,366</b>		<b>331</b>		<b>64</b>	

**Table 4-15:** Building Economic Losses (in Millions of Dollars) for a 5.5 Magnitude Estimates in Fulton County, IL

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
<b>Income Losses</b>							
	Wage	0.00	0.26	2.44	0.04	0.45	3.19
	Capital-Related	0.00	0.11	2.32	0.02	0.10	2.55
	Rental	1.42	0.69	1.10	0.01	0.17	3.38
	Relocation	5.21	0.58	1.58	0.08	1.40	8.86
	<b>Subtotal</b>	<b>6.63</b>	<b>1.64</b>	<b>7.44</b>	<b>0.15</b>	<b>2.12</b>	<b>17.98</b>
<b>Capital Stock Losses</b>							
	Structural	7.59	1.34	1.83	0.21	1.84	12.80
	Non_Structural	30.36	6.45	6.32	0.87	4.53	48.53
	Content	12.72	2.09	4.02	0.58	3.25	22.66
	Inventory	0.00	0.00	0.10	0.12	0.12	0.34
	<b>Subtotal</b>	<b>50.67</b>	<b>9.88</b>	<b>12.28</b>	<b>1.78</b>	<b>9.73</b>	<b>84.34</b>
	<b>Total</b>	<b>57.30</b>	<b>11.51</b>	<b>19.72</b>	<b>1.94</b>	<b>11.85</b>	<b>102.31</b>

Total building-related losses totaled \$102.31; 18% of the estimated losses were related to the business interruption. By far, the largest loss was sustained by the residential occupancies, which comprised more than 67% of the total loss.

### **Results for 5.5M Scenario – Essential Facilities**

Before the earthquake, the region had 763 care beds available for use. On the day of the earthquake, the model estimates that only 99 care beds (14%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 73% of the beds will be back in service. By day 30, 91% will be operational.

### **Results for 500-Year Probabilistic Scenario – General Building Stock**

The results of the 500-year probabilistic analysis are shown in Tables 4-25 and 4-26. Hazus-MH estimates that approximately 255 buildings will be at least moderately damaged. This is more than 1.0% of the total number of buildings in the region. It is estimated that seven buildings will be damaged beyond repair. Building-related losses totaled \$7.84 million; 30% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up more than 62% of the total loss.

**Table 4-25: 500-Year Probabilistic Earthquake Damage Estimates by Building Occupancy for Fulton County, IL**

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	218	1.17	14	1.94	6	2.78	1	3.32	0	1.90
Commercial	630	3.37	38	5.28	15	6.55	2	7.57	0	5.16
Education	27	0.14	2	0.23	1	0.30	0	0.34	0	0.36
Government	49	0.26	3	0.37	1	0.46	0	0.46	0	0.48
Industrial	135	0.72	8	1.14	3	1.45	1	1.67	0	1.04
Other Residential	4,353	23.30	204	28.18	70	31.34	7	22.63	1	20.78
Religion	82	0.44	5	0.65	2	0.87	0	1.06	0	0.94
Single Family	13,192	70.60	450	62.22	125	56.26	19	62.94	2	69.33
<b>Total</b>	<b>18,685</b>		<b>723</b>		<b>223</b>		<b>30</b>		<b>3</b>	

**Table 4-26: 500-Year Probabilistic Earthquake Estimates of Building Economic Losses (in Millions of Dollars) for Fulton County, IL**

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
<b>Income Losses</b>							
	Wage	0.00	0.03	0.33	0.01	0.07	0.43
	Capital-Related	0.00	0.01	0.30	0.00	0.01	0.33
	Rental	0.17	0.10	0.18	0.00	0.02	0.47
	Relocation	0.62	0.09	0.24	0.02	0.19	1.15
	<b>Subtotal</b>	<b>0.79</b>	<b>0.22</b>	<b>1.05</b>	<b>0.03</b>	<b>0.29</b>	<b>2.38</b>
<b>Capital Stock Losses</b>							
	Structural	0.93	0.20	0.28	0.04	0.25	1.70
	Non_Structural	1.86	0.43	0.42	0.06	0.29	3.06
	Content	0.32	0.06	0.15	0.03	0.12	0.69
	Inventory	0.00	0.00	0.00	0.01	0.00	0.01
	<b>Subtotal</b>	<b>3.11</b>	<b>0.70</b>	<b>0.85</b>	<b>0.13</b>	<b>0.67</b>	<b>5.46</b>
	<b>Total</b>	<b>3.91</b>	<b>0.92</b>	<b>1.90</b>	<b>0.16</b>	<b>0.96</b>	<b>7.84</b>

**Results for 500-Year Probabilistic Scenario – Essential Facilities**

Before the earthquake, the region had 736 care beds available for use. On the day of the earthquake, the model estimates that only 364 care beds (49%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 96% of the beds will be back in service. By day 30, 100% will be operational.

**Vulnerability to Future Assets/Infrastructure for Earthquake Hazard**

New construction, especially critical facilities, should accommodate earthquake mitigation design standards.

**Suggestions for Community Development Trends**

Community development will occur outside of the low-lying areas in floodplains with a water table within five feet of grade that is susceptible to liquefaction.

In Meeting #4, the MHMP team discussed specific mitigation strategies for reducing earthquake hazard. The discussion included strategies to harden and protect future, as well as existing, structures against the possible termination of public services and systems including power lines, water and sanitary lines, and public communication.

#### **4.4.4 Thunderstorm Hazard**

##### ***Hazard Definition – Thunderstorm***

Severe thunderstorms are defined as thunderstorms with one or more of the following characteristics: strong winds, large damaging hail, or frequent lightning. Severe thunderstorms most frequently occur in Illinois during the spring and summer months, but can occur any month of the year at any time of day. A severe thunderstorm's impacts can be localized or can be widespread in nature. A thunderstorm is classified as severe when it meets one or more of the following criteria.

- Hail of diameter 0.75 inches or higher
- Frequent and dangerous lightning
- Wind speeds equal to or greater than 58 miles per hour

##### ***Hail***

Hail can be a product of a strong thunderstorm. Hail usually falls near the center of a storm, however strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, resulting in damage in other areas near the storm. Hailstones range from pea-sized to baseball-sized, and hailstones larger than softballs have been reported on rare occasions.

##### ***Lightning***

Lightning is a discharge of electricity from a thunderstorm. Lightning is often perceived as a minor hazard, but in reality lightning causes damage to many structures and kills or severely injures numerous people in the United States each year.

##### ***Severe Winds (Straight-Line Winds)***

Straight-line winds from thunderstorms are a fairly common occurrence across Illinois. Straight-line winds can cause damage to homes, businesses, power lines, and agricultural areas, and may require temporary sheltering of individuals who are without power for extended periods of time.

##### ***Previous Occurrences for Thunderstorm Hazard***

The NCDC database reported 89 hail storms in Fulton County since 1972. Hail storms occur nearly every year in the late spring and early summer months. The most recent reported occurrence was in June 2009 when severe thunderstorms produced large hail and wind gusts over 70 mph.

Fulton County hail storms are identified in Table 4-27. Additional details of individual hazard events can be found on the [NCDC website](#).

**Table 4-27: NCDC-Recorded Hail Storms for Fulton County, IL**

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	4/14/1972	Hail	1.00 in.	0	0	0	0
Fulton County	6/14/1974	Hail	2.00 in.	0	0	0	0
Fulton County	6/14/1974	Hail	1.75 in.	0	0	0	0
Fulton County	6/21/1974	Hail	1.75 in.	0	0	0	0
Fulton County	6/13/1975	Hail	0.75 in.	0	0	0	0
Fulton County	6/13/1975	Hail	0.75 in.	0	0	0	0
Fulton County	6/13/1975	Hail	3.00 in.	0	0	0	0
Fulton County	6/20/1975	Hail	1.00 in.	0	0	0	0
Fulton County	6/17/1977	Hail	1.75 in.	0	0	0	0
Fulton County	6/17/1978	Hail	0.75 in.	0	0	0	0
Fulton County	6/1/1980	Hail	1.00 in.	0	0	0	0
Fulton County	6/2/1980	Hail	0.75 in.	0	0	0	0
Fulton County	9/6/1980	Hail	1.75 in.	0	0	0	0
Fulton County	4/13/1981	Hail	1.50 in.	0	0	0	0
Fulton County	6/20/1981	Hail	1.50 in.	0	0	0	0
Fulton County	7/3/1982	Hail	0.75 in.	0	0	0	0
Fulton County	8/27/1983	Hail	0.75 in.	0	0	0	0
Fulton County	5/11/1987	Hail	1.75 in.	0	0	0	0
Fulton County	4/27/1989	Hail	1.75 in.	0	0	0	0
Fulton County	6/23/1992	Hail	1.75 in.	0	0	0	0
Fulton County	6/23/1992	Hail	1.00 in.	0	0	0	0
Fulton County	7/2/1992	Hail	0.75 in.	0	0	0	0
Lewistown	5/13/1995	Hail	1.25 in.	0	0	0	0
Smithfield	5/13/1995	Hail	0.75 in.	0	0	0	0
Lewistown	2/26/1996	Hail	1.75 in.	0	0	0	0
Ipava/Lewistown	4/18/1996	Hail	1.75 in.	0	0	0	0
Canton	4/19/1996	Hail	0.75 in.	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Astoria	4/19/1996	Hail	1.75 in.	0	0	0	0
Lewistown	7/19/1997	Hail	1.00 in.	0	0	0	0
Monterey	4/7/1998	Hail	0.75 in.	0	0	0	0
Astoria	4/7/1998	Hail	0.75 in.	0	0	0	0
Canton	4/7/1998	Hail	1.75 in.	0	0	0	0
Table Grove	5/12/1998	Hail	1.75 in.	0	0	14	0
Canton	4/19/2000	Hail	0.88 in.	0	0	0	0
Avon	5/8/2000	Hail	0.75 in.	0	0	0	0
Lewistown	5/31/2000	Hail	0.75 in.	0	0	0	0
Astoria	6/23/2000	Hail	1.00 in.	0	0	0	0
Marietta	8/26/2000	Hail	1.75 in.	0	0	0	0
Marietta	6/17/2001	Hail	0.88 in.	0	0	0	0
Middlegrove	4/27/2002	Hail	0.75 in.	0	0	0	0
Lewistown	5/8/2002	Hail	1.00 in.	0	0	0	0
Fairview	6/4/2002	Hail	0.75 in.	0	0	0	0
Duncan Mills	5/8/2003	Hail	1.75 in.	0	0	0	0
Lewistown	5/9/2003	Hail	1.75 in.	0	0	0	0
Cuba	5/14/2003	Hail	0.75 in.	0	0	0	0
Lewistown	8/2/2003	Hail	0.75 in.	0	0	0	0
Avon	5/2/2004	Hail	0.75 in.	0	0	0	0
Cuba	5/2/2004	Hail	1.00 in.	0	0	0	0
Canton	5/30/2004	Hail	0.88 in.	0	0	0	0
Smithfield	7/5/2004	Hail	0.88 in.	0	0	0	0
Farmington	8/18/2004	Hail	0.88 in.	0	0	0	0
Marietta	3/30/2005	Hail	0.88 in.	0	0	0	0
Lewistown	3/30/2005	Hail	0.88 in.	0	0	0	0
Fiatt	3/30/2005	Hail	1.00 in.	0	0	0	0
Duncan Mills	3/30/2005	Hail	1.00 in.	0	0	0	0
St David	3/30/2005	Hail	1.75 in.	0	0	0	0
Canton	3/30/2005	Hail	0.88 in.	0	0	0	0
Ipava	6/13/2005	Hail	0.75 in.	0	0	0	0
Lewistown	6/13/2005	Hail	1.75 in.	0	0	0	0
Banner	9/19/2005	Hail	0.75 in.	0	0	0	0
Canton	9/19/2005	Hail	1.75 in.	0	0	0	0
Lewistown	3/11/2006	Hail	0.88 in.	0	0	0	0
Farmington	4/13/2006	Hail	1.75 in.	0	0	0	0
Lewistown	5/24/2006	Hail	0.88 in.	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Bryant	5/24/2006	Hail	2.00 in.	0	0	0	0
Lewistown	5/24/2006	Hail	3.00 in.	0	0	0	0
Dunfermline	5/24/2006	Hail	2.00 in.	0	0	0	0
Bryant	5/24/2006	Hail	1.00 in.	0	0	0	0
Marietta	5/24/2006	Hail	0.88 in.	0	0	0	0
Fairview	5/30/2006	Hail	1.00 in.	0	0	0	0
Smithfield	9/11/2006	Hail	1.00 in.	0	0	0	0
Astoria	9/22/2006	Hail	0.75 in.	0	0	0	0
Duncan Mills	1/7/2008	Hail	0.75 in.	0	0	0	0
Marietta	5/13/2008	Hail	0.75 in.	0	0	0	0
Farmington	5/13/2008	Hail	1.00 in.	0	0	0	0
Canton	6/15/2008	Hail	0.88 in.	0	0	0	0
Ellisville	7/21/2008	Hail	0.88 in.	0	0	0	0
Cuba	7/21/2008	Hail	1.00 in.	0	0	0	0
Fairview	7/21/2008	Hail	1.00 in.	0	0	0	0
Canton	7/21/2008	Hail	1.75 in.	0	0	0	0
Cuba	7/21/2008	Hail	2.75 in.	0	0	0	0
Canton	7/21/2008	Hail	0.88 in.	0	0	0	0
St David	7/21/2008	Hail	0.75 in.	0	0	0	0
Canton	7/21/2008	Hail	1.00 in.	0	0	0	0
Fiatt	7/21/2008	Hail	2.75 in.	0	0	0	0
St David	7/21/2008	Hail	1.00 in.	0	0	0	0
Dunfermline	7/21/2008	Hail	1.75 in.	0	0	0	0
Fiatt	6/18/2009	Hail	1.75 in.	0	0	0	0
St David	6/18/2009	Hail	1.00 in.	0	0	0	0
<b>Total</b>				<b>0</b>	<b>0</b>	<b>\$14</b>	<b>\$0</b>

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

The NCDC database reported no occurrences of significant lightning strikes in Fulton County since 1961.

The NCDC database identified 171 wind storms reported since 1961 totaling approximately \$1.2 million, the most recent of which was reported in August 2009 when storms produced wind gusts between 60 and 70 mph.

As shown in Table 4-28, wind storms occurred year-round with the greatest frequency and damage between May and July. The following table includes available top wind speeds for Fulton County.

**Table 4-16: NCDC-Recorded Wind Storms for Fulton County, IL**

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	5/14/1961	Tstm Wind	64 kts.	0	0	0	0
Fulton County	7/18/1963	Tstm Wind	NR	0	0	0	0
Fulton County	7/18/1966	Tstm Wind	NR	0	0	0	0
Fulton County	7/23/1967	Tstm Wind	NR	0	0	0	0
Fulton County	7/7/1968	Tstm Wind	55 kts.	0	0	0	0
Fulton County	7/3/1970	Tstm Wind	NR	0	0	0	0
Fulton County	12/4/1973	Tstm Wind	NR	0	0	0	0
Fulton County	12/4/1973	Tstm Wind	NR	0	0	0	0
Fulton County	6/19/1974	Tstm Wind	NR	0	0	0	0
Fulton County	6/20/1974	Tstm Wind	NR	0	0	0	0
Fulton County	6/20/1974	Tstm Wind	NR	0	0	0	0
Fulton County	6/21/1974	Tstm Wind	NR	0	0	0	0
Fulton County	5/20/1975	Tstm Wind	52 kts.	0	0	0	0
Fulton County	8/11/1975	Tstm Wind	NR	0	0	0	0
Fulton County	3/4/1976	Tstm Wind	NR	0	0	0	0
Fulton County	8/11/1976	Tstm Wind	NR	0	0	0	0
Fulton County	5/4/1977	Tstm Wind	52 kts.	0	0	0	0
Fulton County	5/4/1977	Tstm Wind	NR	0	0	0	0
Fulton County	6/17/1977	Tstm Wind	52 kts.	0	0	0	0
Fulton County	6/17/1977	Tstm Wind	52 kts.	0	0	0	0
Fulton County	6/17/1977	Tstm Wind	52 kts.	0	0	0	0
Fulton County	8/13/1980	Tstm Wind	NR	0	0	0	0
Fulton County	9/1/1980	Tstm Wind	52 kts.	0	0	0	0
Fulton County	9/6/1980	Tstm Wind	NR	0	0	0	0
Fulton County	4/3/1981	Tstm Wind	NR	0	0	0	0
Fulton County	6/29/1981	Tstm Wind	61 kts.	0	0	0	0
Fulton County	6/7/1982	Tstm Wind	NR	0	0	0	0
Fulton County	6/7/1982	Tstm Wind	52 kts.	0	0	0	0
Fulton County	7/2/1982	Tstm Wind	NR	0	0	0	0
Fulton County	9/17/1982	Tstm Wind	52 kts.	0	0	0	0
Fulton County	12/27/1982	Tstm Wind	NR	0	0	0	0
Fulton County	8/27/1983	Tstm Wind	NR	0	0	0	0
Fulton County	4/29/1984	Tstm Wind	57 kts.	0	0	0	0
Fulton County	7/31/1986	Tstm Wind	NR	0	0	0	0
Fulton County	5/21/1987	Tstm Wind	61 kts.	0	0	0	0
Fulton County	5/21/1987	Tstm Wind	57 kts.	0	0	0	0
Fulton County	5/8/1988	Tstm Wind	NR	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	5/8/1988	Tstm Wind	NR	0	0	0	0
Fulton County	8/18/1988	Tstm Wind	NR	0	0	0	0
Fulton County	6/13/1990	Tstm Wind	56 kts.	0	0	0	0
Fulton County	8/29/1990	Tstm Wind	NR	0	0	0	0
Fulton County	5/17/1991	Tstm Wind	NR	0	0	0	0
Fulton County	5/31/1991	Tstm Wind	52 kts.	0	0	0	0
Fulton County	6/15/1991	Tstm Wind	52 kts.	0	0	0	0
Fulton County	6/15/1991	Tstm Wind	NR	0	0	0	0
Fulton County	10/4/1991	Tstm Wind	NR	0	0	0	0
Fulton County	4/15/1992	Tstm Wind	NR	0	0	0	0
Fulton County	4/15/1992	Tstm Wind	NR	0	0	0	0
Fulton County	6/17/1992	Tstm Wind	NR	0	0	0	0
Fulton County	7/2/1992	Tstm Wind	NR	0	0	0	0
Fulton County	7/25/1992	Tstm Wind	NR	0	0	0	0
Fulton County	9/7/1992	Tstm Wind	NR	0	0	0	0
Fulton County	9/7/1992	Tstm Wind	NR	0	0	0	0
Fulton County	9/9/1992	Tstm Wind	NR	0	0	0	0
Enion	5/10/1993	Tstm Wind	NR	0	0	0	0
Cuba	8/23/1993	Tstm Wind	NR	0	0	0	0
Canton	8/23/1993	Tstm Wind	NR	0	0	1	0
Ipava	8/28/1993	Tstm Wind	NR	0	0	5	0
Bryant	5/24/1994	Tstm Wind	NR	0	0	1	0
Summum	7/20/1994	Tstm Wind	NR	0	0	0	0
Canton	5/9/1995	Tstm Wind	6NR kts.	0	0	0	0
Farmington	6/20/1995	Tstm Wind	52 kts.	0	0	0	0
Fulton County	3/25/1996	High Wind	NR	1	0	0	0
Canton	6/2/1996	Tstm Wind	NR	0	0	0	0
Canton	7/30/1996	Tstm Wind	5NR kts.	0	0	0	0
Astoria	8/7/1996	Tstm Wind	52 kts.	0	0	0	0
Astoria	10/29/1996	Tstm Wind	NR	0	0	0	0
Fulton County	10/30/1996	High Wind	56 kts.	0	0	0	0
Lewistown	4/5/1997	Tstm Wind	NR	0	0	0	0
Fulton County	4/6/1997	High Wind	56 kts.	0	0	0	0
Fulton County	4/30/1997	High Wind	61 kts.	0	1	38	0
Canton	7/19/1997	Tstm Wind	NR	0	0	0	0
Lewistown	7/19/1997	Tstm Wind	NR	0	0	0	0
Ellisville	8/3/1997	Tstm Wind	NR	0	0	0	0
Fulton County	9/29/1997	High Wind	55 kts.	0	0	0	0
Astoria	3/27/1998	Tstm Wind	NR	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Little America	5/15/1998	Tstm Wind	NR	0	0	0	0
Ellisville	5/19/1998	Tstm Wind	NR	0	0	1	0
Vermont	5/24/1998	Tstm Wind	NR	0	0	0	0
Farmington	6/18/1998	Tstm Wind	NR	0	0	0	0
Countywide	6/29/1998	Tstm Wind	61 kts.	0	1	100	0
Fulton County	11/10/1998	High Wind	57 kts.	0	1	60	0
Ellisville	11/10/1998	Tstm Wind	NR	0	0	0	0
Avon	4/8/1999	Tstm Wind	NR	0	0	0	0
Astoria	6/1/1999	Tstm Wind	NR	0	0	0	0
Fairview	6/4/1999	Tstm Wind	NR	0	0	0	0
Astoria	8/12/1999	Tstm Wind	NR	0	0	50	0
Farmington	8/23/1999	Tstm Wind	NR	0	0	10	0
Avon	2/29/2000	Tstm Wind	NR	0	0	0	0
Duncan Mills	4/20/2000	Tstm Wind	NR	0	0	0	0
Canton	6/12/2000	Tstm Wind	NR	0	0	0	0
Canton	6/23/2000	Tstm Wind	NR	0	0	0	0
Astoria	9/11/2000	Tstm Wind	NR	0	0	0	0
Marietta	9/14/2000	Tstm Wind	51 kts.	0	0	0	0
Little America	10/3/2000	Tstm Wind	NR	0	0	0	0
Fairview	4/10/2001	Tstm Wind	5NR kts.	0	0	0	0
Lewistown	4/21/2001	Tstm Wind	5NR kts.	0	0	0	0
Cuba	6/14/2001	Tstm Wind	5NR kts.	0	0	0	0
Lewistown	6/17/2001	Tstm Wind	5NR kts.	0	0	0	0
Astoria	7/17/2001	Tstm Wind	52 kts.	0	0	0	0
Marietta	8/2/2001	Tstm Wind	52 kts.	0	0	0	0
Farmington	8/22/2001	Tstm Wind	53 kts.	0	1	0	0
Countywide	6/12/2002	Tstm Wind	61 kts.	0	0	0	0
Cuba	7/26/2002	Tstm Wind	5NR kts.	0	0	0	0
Fairview	4/4/2003	Tstm Wind	5NR kts.	0	0	0	0
Smithfield	5/10/2003	Tstm Wind	52 kts.	0	0	0	0
Countywide	6/25/2003	Tstm Wind	55 kts.	0	0	0	0
Canton	7/21/2003	Tstm Wind	5NR kts.	0	0	0	0
Table Grove	5/24/2004	Tstm Wind	52 kts.	0	0	0	0
Little America	5/30/2004	Tstm Wind	5NR kts.	0	0	0	0
Astoria	5/31/2004	Tstm Wind	5NR kts.	0	0	0	0
Lewistown	6/10/2004	Tstm Wind	5NR kts.	0	0	0	0
London Mills	8/18/2004	Tstm Wind	52 kts.	0	0	0	0
Canton	6/4/2005	Tstm Wind	5NR kts.	0	0	0	0
Farmington	6/4/2005	Tstm Wind	63 kts.	0	0	0	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Canton	6/5/2005	Tstm Wind	55 kts.	0	0	0	0
Marietta	6/8/2005	Tstm Wind	5NR kts.	0	0	0	0
Ipava	6/8/2005	Tstm Wind	5NR kts.	0	0	0	0
St David	8/10/2005	Tstm Wind	5NR kts.	0	0	0	0
Astoria	8/18/2005	Tstm Wind	5NR kts.	0	0	0	0
Canton	8/19/2005	Tstm Wind	5NR kts.	0	0	0	0
Astoria	9/8/2005	Tstm Wind	5NR kts.	0	0	0	0
London Mills	9/13/2005	Tstm Wind	55 kts.	0	0	0	0
Fairview	9/19/2005	Tstm Wind	5NR kts.	0	0	0	0
Marietta	4/2/2006	Tstm Wind	52 kts.	0	0	0	0
Canton	4/13/2006	Tstm Wind	6NR kts.	0	0	0	0
Farmington	4/13/2006	Tstm Wind	61 kts.	0	0	0	0
Lewistown	5/24/2006	Tstm Wind	52 kts.	0	0	0	0
Dunfermline	5/24/2006	Tstm Wind	52 kts.	0	0	0	0
Lewistown	6/22/2006	Tstm Wind	5NR kts.	0	0	0	0
Little America	7/2/2006	Tstm Wind	52 kts.	0	0	0	0
Smithfield	7/19/2006	Tstm Wind	52 kts.	0	0	0	0
Marietta	9/11/2006	Tstm Wind	55 kts.	0	0	0	0
Bernadotte	9/11/2006	Tstm Wind	52 kts.	0	0	0	0
Astoria	5/15/2007	Tstm Wind	55 kts.	0	0	0	0
Smithfield	6/21/2007	Tstm Wind	52 kts.	0	0	0	0
London Mills	8/7/2007	Tstm Wind	5NR kts.	0	0	1	0
Canton	8/7/2007	Tstm Wind	56 kts.	0	0	1	0
St David	8/7/2007	Tstm Wind	5NR kts.	0	0	18	0
Canton	6/13/2008	Tstm Wind	52 kts.	0	0	20	0
Ipava	6/15/2008	Tstm Wind	61 kts.	0	0	70	0
Fiatt	7/21/2008	Tstm Wind	61 kts.	0	0	30	0
Canton	7/21/2008	Tstm Wind	61 kts.	0	0	175	0
Lewistown	7/29/2008	Tstm Wind	52 kts.	0	0	10	0
Cuba	7/29/2008	Tstm Wind	52 kts.	0	0	4	0
Canton	7/29/2008	Tstm Wind	52 kts.	0	0	0	0
Farmington	8/5/2008	Tstm Wind	61 kts.	0	0	8	0
Table Grove	12/27/2008	Tstm Wind	52 kts.	0	0	30	0
Fairview	12/27/2008	Tstm Wind	52 kts.	0	0	8	0
Duncan Mills	12/27/2008	Tstm Wind	52 kts.	0	0	12	0
Canton	12/27/2008	Tstm Wind	61 kts.	0	0	2	0
Canton	12/27/2008	Tstm Wind	52 kts.	0	0	12	0
Cuba	3/8/2009	Tstm Wind	52 kts.	0	0	10	0
Canton	3/8/2009	Tstm Wind	52 kts.	0	0	50	0

Location or County*	Date	Type	Magnitude	Deaths	Injuries	Property Damage (x\$1000)	Crop Damage (x\$1000)
Fulton County	3/24/2009	High Wind	52 kts.	0	0	2	0
Canton	6/18/2009	Tstm Wind	61 kts.	0	0	75	0
St David	6/18/2009	Tstm Wind	61 kts.	0	0	60	0
Lewistown	6/19/2009	Tstm Wind	52 kts.	0	0	25	0
Farmington	6/19/2009	Tstm Wind	52 kts.	0	0	20	0
Ipava	6/19/2009	Tstm Wind	52 kts.	0	0	25	0
Marietta	6/19/2009	Tstm Wind	52 kts.	0	0	12	0
Cuba	6/27/2009	Tstm Wind	52 kts.	0	0	12	0
Lewistown	6/27/2009	Tstm Wind	52 kts.	0	0	20	0
Cuba	7/24/2009	Tstm Wind	52 kts.	0	0	20	0
Smithfield	7/24/2009	Tstm Wind	52 kts.	0	0	4	0
Smithfield	7/24/2009	Tstm Wind	52 kts.	0	0	10	0
Cuba	7/24/2009	Tstm Wind	52 kts.	0	0	90	0
Table Grove	7/24/2009	Tstm Wind	61 kts.	0	0	6	0
Vermont	8/4/2009	Tstm Wind	61 kts.	0	1	100	0
Canton	8/4/2009	Tstm Wind	61 kts.	0	0	20	0
<b>Total</b>				<b>1</b>	<b>5</b>	<b>\$1,228</b>	<b>0</b>

\*NR is 'not recorded'

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

**Geographic Location of Thunderstorm Hazard**

The entire county has the same risk for occurrence of thunderstorms. They can occur at any location within the county.

**Hazard Extent for Thunderstorm Hazard**

The extent of the historical thunderstorms depends upon the extent of the storm, the wind speed, and the size of hail stones. Thunderstorms can occur at any location within the county.

**Risk Identification for Thunderstorm Hazard**

Based on historical information, the occurrence of future high winds, hail, and lightning is highly likely. High winds with widely varying magnitudes are expected to happen. According to the RPI, thunderstorms and high wind damage ranked as the number four hazard.

RPI = Probability x Magnitude/Severity.

<b>Probability</b>	<b>x</b>	<b>Magnitude /Severity</b>	<b>=</b>	<b>RPI</b>
4	x	2	=	8

## ***Vulnerability Analysis for Thunderstorm Hazard***

Severe thunderstorms are equally distributed; therefore, the entire county's population and all buildings are vulnerable to a severe thunderstorm and can expect the same impacts within the affected area. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Fulton County are discussed in Table 4-9 and 4-10.

### ***Critical Facilities***

All critical facilities are vulnerable to severe thunderstorms. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a damaged police station will no longer be able to serve the community). Table 4-8 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities are included as Appendices E and F.

### ***Building Inventory***

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-10. The buildings within the county can expect impacts similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a damaged home will no longer be habitable causing residents to seek shelter).

### ***Infrastructure***

During a severe thunderstorm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that any number of these structures could become damaged during a severe thunderstorm. The impacts to these structures include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or impassable railways. Bridges could become impassable causing risk to traffic.

### ***Potential Dollar Losses for Thunderstorm Hazard***

To determine dollar losses for a thunderstorm hazard, the available NCDC hazard information was condensed to include only thunderstorm hazards that occurred within the past ten years. Fulton County's mitigation planning team then reviewed the property damages reported to NCDC and made any applicable updates.

It was determined that since 1999, Fulton County has incurred \$1.02 million in damages relating to thunderstorms, including hail, lightning, and high winds. The location, date, and type of each event resulting in property damage are listed in Table 4-29.

**Table 4-17:** NCDC-Recorded Property Damage from Thunderstorms for Fulton County, IL

<b>Location or County*</b>	<b>Date</b>	<b>Type</b>	<b>Property Damage</b>
Astoria	8/12/1999	Tstm Wind	\$ 50,000
Farmington	8/23/1999	Tstm Wind	\$ 10,000

Location or County*	Date	Type	Property Damage
<b>1999 Subtotal</b>			<b>\$ 60,000</b>
<b>2000-2006 Subtotal</b>			<b>\$ 0</b>
London Mills	8/7/2007	Tstm Wind	\$ 1,000
Canton	8/7/2007	Tstm Wind	\$ 1,000
St David	8/7/2007	Tstm Wind	\$ 18,000
<b>2007 Subtotal</b>			<b>\$ 20,000</b>
Canton	6/13/2008	Tstm Wind	\$ 20,000
Ipava	6/15/2008	Tstm Wind	\$ 70,000
Fiatt	7/21/2008	Tstm Wind	\$ 30,000
Canton	7/21/2008	Tstm Wind	\$ 175,000
Lewistown	7/29/2008	Tstm Wind	\$ 10,000
Cuba	7/29/2008	Tstm Wind	\$ 4,000
Farmington	8/5/2008	Tstm Wind	\$ 8,000
Table Grove	12/27/2008	Tstm Wind	\$ 30,000
Fairview	12/27/2008	Tstm Wind	\$ 8,000
Duncan Mills	12/27/2008	Tstm Wind	\$ 12,000
Canton	12/27/2008	Tstm Wind	\$ 2,000
Canton	12/27/2008	Tstm Wind	\$ 12,000
<b>2008 Subtotal</b>			<b>\$ 381,000</b>
Cuba	3/8/2009	Tstm Wind	\$ 10,000
Canton	3/8/2009	Tstm Wind	\$ 50,000
Fulton County	3/24/2009	High Wind	\$ 2,000
Canton	6/18/2009	Tstm Wind	\$ 75,000
St David	6/18/2009	Tstm Wind	\$ 60,000
Lewistown	6/19/2009	Tstm Wind	\$ 25,000
Farmington	6/19/2009	Tstm Wind	\$ 20,000
Ipava	6/19/2009	Tstm Wind	\$ 25,000
Marietta	6/19/2009	Tstm Wind	\$ 12,000
Cuba	6/27/2009	Tstm Wind	\$ 12,000
Lewistown	6/27/2009	Tstm Wind	\$ 20,000
Cuba	7/24/2009	Tstm Wind	\$ 20,000
Smithfield	7/24/2009	Tstm Wind	\$ 4,000
Smithfield	7/24/2009	Tstm Wind	\$ 10,000
Cuba	7/24/2009	Tstm Wind	\$ 90,000
Table Grove	7/24/2009	Tstm Wind	\$ 6,000
Vermont	8/4/2009	Tstm Wind	\$ 100,000
Canton	8/4/2009	Tstm Wind	\$ 20,000
<b>2009 Subtotal</b>			<b>\$ 561,000</b>
<b>Total Property Damage</b>			<b>\$ 1,022,000</b>

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Historical thunderstorm damage data has not been collected systematically and may not fully document all losses. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based

on average property damage in the past decade, we estimate that Fulton County incurs property damages of approximately \$102,000 per year related to severe thunderstorms.

### ***Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard***

All future development within the county and all communities will remain vulnerable to these events.

### ***Suggestions for Community Development Trends***

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warning of approaching storms are also vital to ensuring the safety of Fulton County residents.

## **4.4.5 Winter Storm Hazard**

### ***Hazard Definition of Winter Storm Hazard***

Severe winter weather consists of various forms of precipitation and weather conditions. This may include one or more of the following: freezing rain, sleet, heavy snow, blizzards, icy roadways, extreme low temperatures, and strong winds. These conditions can cause human health risks such as frostbite, hypothermia, death and cause property damage and disrupt economic activity..

### ***Ice (Glazing) and Sleet Storms***

Ice or sleet, even in small quantities, can result in hazardous driving conditions and can cause property damage. Sleet involves raindrops that freeze completely before reaching the ground.. Sleet does not stick to trees and wires. Ice storms, on the other hand, involve liquid rain that falls through subfreezing air and/or onto sub-freezing surfaces, freezing on contact with those surfaces. The ice coats trees, buildings, overhead wires, and roadways, sometimes causing extensive damage.

Some of the most damaging winter storms in Illinois have been ice storms. Ice storms occur when moisture-laden Gulf air converges with the northern jet stream causing freezing rain that coats power and communication lines and trees with heavy ice. Strong winds can cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication.

### ***Snow Storms***

Significant snowstorms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. A blizzard is categorized as a snowstorm with winds of 35 miles per hour or greater and/or visibility of less than one-quarter mile for three or more hours. Strong winds during a blizzard blow falling and already existing snow, creating poor visibility and impassable roadways. Blizzards can potential to result in property damage.

Illinois has repeatedly been struck by blizzards. Blizzard conditions cause power outages, loss of communication, and make transportation difficult. The blowing of snow can reduce visibility to less than one-quarter mile, and the resulting disorientation makes even travel by foot dangerous if not deadly.

### ***Severe Cold***

Severe cold involves ambient air temperatures that drop to around 0°F or below. These extreme temperatures can increase the likelihood of frostbite and hypothermia. High winds during severe cold events can enhance the air temperature's effects. Fast winds during cold weather events can lower the wind chill factor (how cold the air feels on your skin). As a result, the time it takes for frostbite and hypothermia to affect a person's body will decrease.

### **Previous Occurrences of Winter Storm Hazard**

The NCDC database identified 44 winter storm and extreme cold events for Fulton County since 1995 totaling \$100,000 in property damage. The most recent reported event occurred in March 2009 when a winter storm swept across west-central Illinois bringing 4-6 inches of snow to the area.

The NCDC winter storms are listed in Table 4-30. Additional details of individual hazard events can be found on the [NCDC website](#).

**Table 4-30: NCDC-Recorded Winter Storm Events for Fulton County, IL**

Location or County	Date	Type	Deaths	Injuries	Property Damage (x\$1000)
Central Illinois	12/8/1995	Winter Storm	1	0	0
Central Illinois	12/18/1995	Winter Storm	1	0	0
Central Illinois	1/4/1996	Winter Storm	0	0	0
Central Illinois	1/18/1996	Winter Storm	0	2	0
Central Illinois	2/2/1996	Extreme Cold	2	0	0
Central Illinois	1/8/1997	Heavy Snow	0	6	0
Central Illinois	1/15/1997	Winter Storm	1	7	0
Central Illinois	1/24/1997	Winter Storm	0	0	0
Central Illinois	1/26/1997	Winter Storm	0	9	0
Central Illinois	4/10/1997	Heavy Snow	0	9	0
Central Illinois	12/9/1997	Heavy Snow	1	0	0
Central Illinois	12/24/1997	Heavy Snow	0	0	0
Central Illinois	12/30/1997	Heavy Snow	3	0	0
Central Illinois	1/8/1998	Heavy Snow	0	0	0
Central Illinois	1/14/1998	Winter Storm	0	0	0
Central Illinois	3/8/1998	Winter Storm	2	0	0
Central Illinois	12/30/1998	Heavy Snow	0	0	0
Central Illinois	1/1/1999	Heavy Snow	1	1	0
Central Illinois	1/5/1999	Extreme Cold	0	0	0
Central Illinois	3/8/1999	Heavy Snow	0	5	0
Central Illinois	2/17/2000	Ice Storm	0	1	0
Central Illinois	12/11/2000	Winter Storm	0	0	0
Central Illinois	1/28/2001	Ice Storm	0	0	0
Central Illinois	1/30/2002	Ice Storm	0	0	0
Central Illinois	3/1/2002	Heavy Snow	0	0	0
Central Illinois	3/25/2002	Winter Storm	0	0	0
Central Illinois	1/2/2003	Heavy Snow	0	0	0
Central Illinois	2/14/2003	Heavy Snow	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage (x\$1000)
Central Illinois	11/24/2004	Winter Storm	0	4	0
Central Illinois	1/5/2005	Ice Storm	0	0	0
Central Illinois	3/21/2006	Winter Storm	0	0	0
Central Illinois	11/29/2006	Winter Storm	0	0	0
Central Illinois	12/1/2006	Winter Storm	0	0	0
Central Illinois	1/12/2007	Ice Storm	0	0	0
Central Illinois	2/13/2007	Winter Storm	0	0	0
Central Illinois	2/24/2007	Ice Storm	0	0	0
Central Illinois	4/5/2007	Frost/freeze	0	0	0
Central Illinois	12/1/2007	Ice Storm	0	0	0
Central Illinois	1/31/2008	Heavy Snow	0	0	0
Central Illinois	2/1/2008	Heavy Snow	0	0	0
Central Illinois	12/18/2008	Ice Storm	0	0	100
Central Illinois	1/15/2009	Extreme Cold/wind Chill	1	0	0
Central Illinois	3/29/2009	Winter Weather	0	0	0
<b>Total</b>			<b>13</b>	<b>44</b>	<b>\$100</b>

\*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

**Geographic Location of Winter Storm Hazard**

Severe winter storms are regional in nature. Most of the NCDC data are calculated regionally or in some cases statewide.

**Hazard Extent of Winter Storm Hazard**

The extent of the historical winter storms varies in terms of storm location, temperature, and ice or snowfall. A severe winter storm can occur anywhere in the jurisdiction.

**Risk Identification of Winter Storm Hazard**

Based on historical information and input from the planning team, the occurrence of future winter storms is likely. Winter storms of varying magnitudes are expected to happen. According to the RPI, winter storms were ranked as the number five hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	2	=	6

**Vulnerability Analysis of Winter Storm Hazard**

Winter storm impacts are equally likely across the entire jurisdiction; therefore, the entire county is vulnerable to a winter storm and can expect impacts within the affected area. The building exposure for Fulton County, as determined from the building inventory, is included in Table 4-9.

## Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as other buildings within the jurisdiction. These impacts include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow. Table 4-9 lists the types and numbers of the essential facilities in the area. A map and list of all critical facilities are included as Appendices E and F.

## Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow.

## Infrastructure

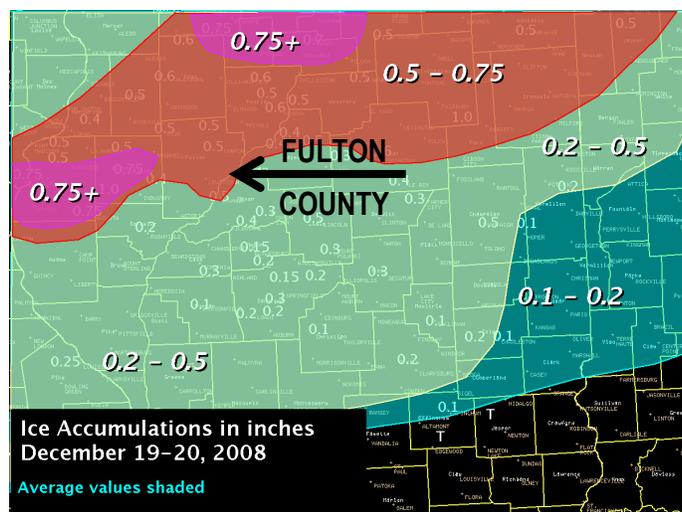
During a winter storm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that any structures could be impacted by a winter storm. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads and railways, and broken water pipes.

## Potential Dollar Losses for Winter Storm Hazard

A HAZUS-MH analysis was not completed for winter storms because the widespread extent of such a hazard makes it difficult to accurately model outcomes.

To determine dollar losses for a winter storm hazard, the available NCDL hazard information was condensed to include only winter storm hazards that occurred within the past ten years. Fulton County's MHMP team then reviewed the property damages reported to NCDL and made any applicable updates.

It was determined that since 1999, Fulton County has not incurred significant property damages for most winter storms, including sleet/ice and heavy snow. However, in December of 2008 severe winter storms caused approximately \$100,000 in damage. The National Weather Service reports that on average, Fulton County received half-an-inch of ice.



The ice accumulation totals from December 19-20 ice storm. Map is from The National Weather Service.

### ***Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard***

Any new development within the county will remain vulnerable to these events.

### ***Suggestions for Community Development Trends***

Because the winter storm events are regional in nature, future development across the county will also face winter storms.

## **4.4.6 Hazardous Materials Storage and Transportation Hazard**

### ***Hazard Definition***

Illinois has numerous active transportation lines that run through many of its counties. Active railways transport harmful and volatile substances between our borders every day. The transportation of chemicals and substances along interstate routes is commonplace in Illinois. The rural areas of Illinois have considerable agricultural commerce, creating demand for fertilizers, herbicides, and pesticides to be transported along rural roads. These factors increase the chance of hazardous material releases and spills throughout the state of Illinois.

The release or spill of certain substances can cause an explosion. Explosions result from the ignition of volatile products such as petroleum products, natural and other flammable gases, hazardous materials/chemicals, dust, and bombs. An explosion can potentially cause death, injury, and property damage. In addition, a fire routinely follows an explosion, which may cause further damage and inhibit emergency response. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials units.

### ***Previous Occurrences of Hazardous Materials Storage and Transportation Hazard***

Fulton County has not experienced a significantly large-scale hazardous material incident at a fixed site or during transport resulting in multiple deaths or serious injuries, although there have been minor releases that have put local firefighters, hazardous materials teams, emergency management, and local law enforcement into action to try to stabilize these incidents and prevent or lessen harm to Fulton County residents.

### ***Geographic Location of Hazardous Materials Storage and Transportation Hazard***

Hazardous material hazards are countywide and are primarily associated with the transport of materials via highway, railroad, and/or river barge.

### ***Hazard Extent of Hazardous Materials Storage and Transportation Hazard***

The extent of the hazardous material hazard varies both in terms of the quantity of material being transported as well as the specific content of the container.

## ***Risk Identification of Hazardous Materials Storage and Transportation***

### ***Hazard***

Based on input from the planning team, the occurrence of a hazardous materials accident is likely. According to the RPI, "hazardous materials storage and transport" ranked as the number six hazard in Fulton County.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	2	=	4

### ***Vulnerability Analysis for Hazardous Materials Storage and Transportation Hazard***

The entire county is vulnerable to a hazardous material release and can expect impacts within the affected area. The main concern during a release or spill is the population affected. The building exposure for Fulton County, as determined from building inventory, is included in Table 4-10. This plan will therefore consider all buildings located within the county as vulnerable.

### ***Critical Facilities***

All critical facilities and communities within the county are at risk. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g., a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all essential facilities in the area. A map and list of all critical facilities are included as Appendices E and F.

### ***Building Inventory***

A table of building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. Buildings within the county can expect impacts similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g., a damaged home will no longer be habitable causing residents to seek shelter).

### ***Infrastructure***

During a hazardous material release the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to this plan, it is important to emphasize that any number of these items could become damaged in the event of a hazardous material release. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); and railway failure from broken or impassable railways. Bridges could become impassable causing risk to traffic.

In terms of numbers and types of buildings and infrastructure, typical scenarios are described to gauge the possible impacts of hazardous material release events in the county.

### **ALOHA Hazardous Chemical Release Analysis**

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for a chlorine release on the north side on Farmington at the intersection of Illinois State Route 116 and the Burlington Northern and Santa Fe Rail Line. Rail tankers commonly transport chlorine through Farmington and other Jurisdictions in Fulton County.

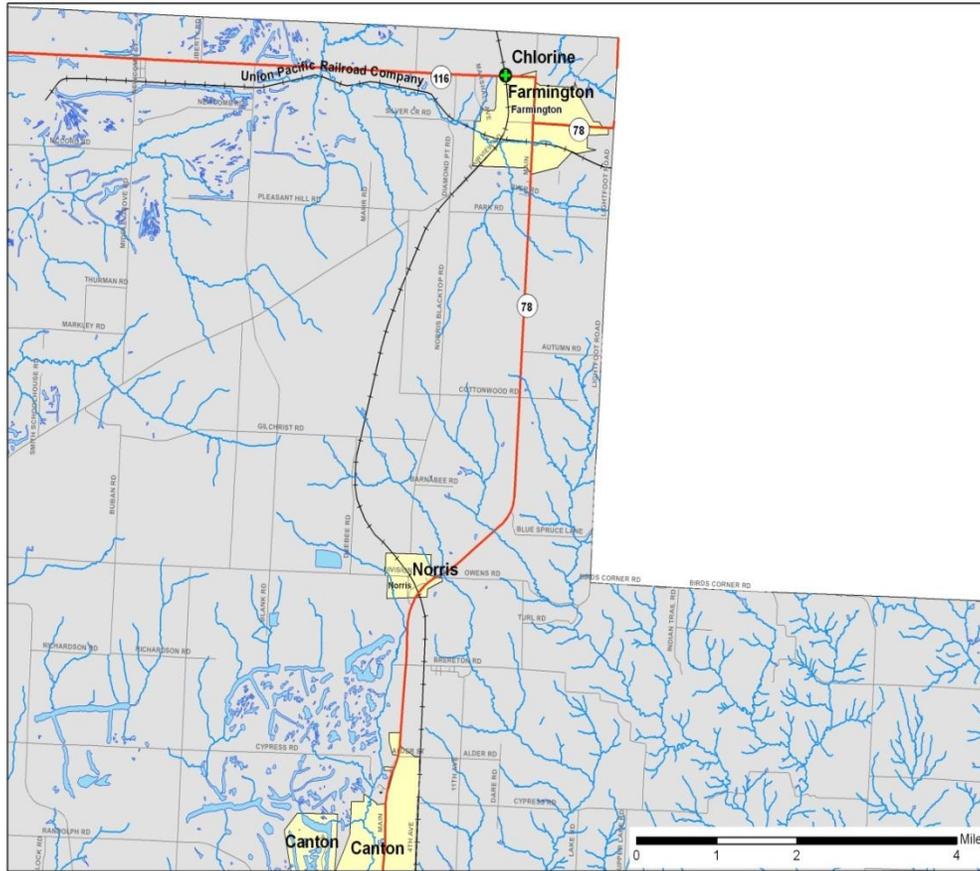
Chlorine is a greenish yellow gas with a pungent to suffocating odor. The gas liquefies above  $-35^{\circ}\text{C}$  at ambient pressure and will liquefy from pressure applied at room temperature. Contact with unconfined liquid chlorine can cause frostbite from evaporative cooling. Chlorine does not burn but, like oxygen, supports combustion. The toxic gas can have adverse health effects from either long-term inhalation of low concentrations of vapors or short-term inhalation of high concentrations. Chlorine vapors are much heavier than air and tend to settle in low areas. Chlorine is commonly used to purify water, bleach wood pulp, and make other chemicals (NOAA Reactivity 2007).

*SOURCE: [HTTP://CAMEOCHEMICALS.NOAA.GOV/CHEMICAL/2862](http://cameochemicals.noaa.gov/chemical/2862)*

ALOHA is a computer program designed especially for response to chemical accidents, as well as for emergency planning and training. Chlorine is a common chemical used in industrial operations and can be found in either liquid or gas form. Rail and truck tankers commonly haul chlorine to and from facilities.

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the north were assumed. The target area was chosen due to its proximity to the residential, commercial, and essential facility locations. The geographic area covered in this analysis is depicted in Figure 4-13.

Figure 4-13: Location of Modeled Chemical Release in Farmington, IL



### Analysis Parameters

The ALOHA atmospheric modeling parameters, depicted in Figure 4-14, were based upon a north-easterly wind speed of five miles per hour. The temperature was 72°F with 25% humidity and a cloud cover of five-tenths skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 85% full. The chlorine in this tank is in its liquid state.

This release was based on a leak from a 2.0-inch-diameter hole, 12 inches above the bottom of the tank. According to the ALOHA parameters, approximately 115,533 pounds of material would be released per minute. The image in Figure 4-15 depicts the plume footprint generated by ALOHA.

**Figure 4-14:** ALOHA Modeling Parameters for Chemical Release in Farmington, IL**SITE DATA:**

Location: FARMINGTON ILLINOIS, ILLINOIS  
Building Air Exchanges Per Hour: 0.49 (unsheltered single storied)  
Time: September 18, 2010 1424 hours CDT (using computer's clock)

**CHEMICAL DATA:**

Chemical Name: CHLORINE                      Molecular Weight: 70.91 g/mol  
AEGL-1(60 min): 0.5 ppm   AEGL-2(60 min): 2 ppm   AEGL-3(60 min): 20 ppm  
IDLH: 10 ppm  
Ambient Boiling Point: -30.3° F  
Vapor Pressure at Ambient Temperature: greater than 1 atm  
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

**ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)**

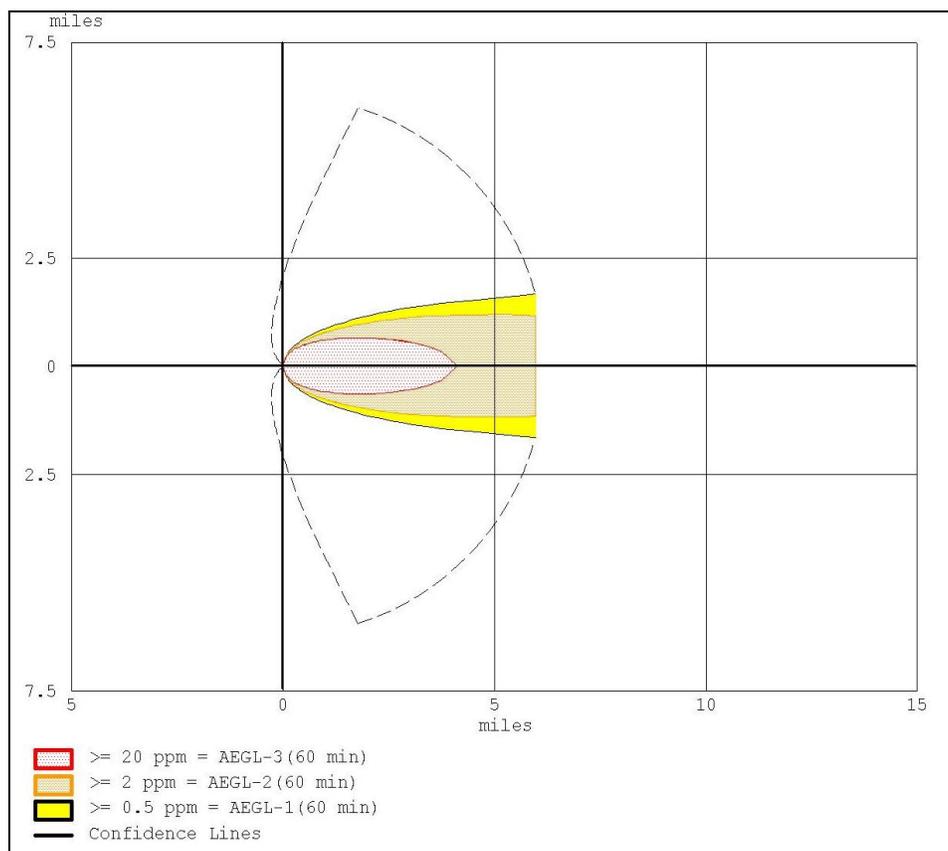
Wind: 5 miles/hour from nnw at 10 feet  
Ground Roughness: open country              Cloud Cover: 5 tenths  
Air Temperature: 72° F                      Stability Class: B  
No Inversion Height                      Relative Humidity: 25%

**SOURCE STRENGTH:**

Leak from hole in horizontal cylindrical tank  
Non-flammable chemical is escaping from tank  
Tank Diameter: 8 feet                      Tank Length: 33 feet  
Tank Volume: 12,408 gallons  
Tank contains liquid                      Internal Temperature: 72° F  
Chemical Mass in Tank: 123,786 pounds  
Tank is 85% full  
Circular Opening Diameter: 2 inches  
Opening is 12 inches from tank bottom  
Release Duration: 25 minutes  
Max Average Sustained Release Rate: 6,860 pounds/min  
(averaged over a minute or more)  
Total Amount Released: 115,533 pounds  
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

**THREAT ZONE:**

Model Run: Heavy Gas  
Red : 4.0 miles --- (20 ppm = AEGL-3(60 min))  
Orange: greater than 6 miles --- (2 ppm = AEGL-2(60 min))  
          Yellow: greater than 6 miles --- (0.5 ppm = AEGL-1(60 min))

**Figure 4-15: ALOHA-Generated Plume Footprint of Farmington, IL Chemical Release**

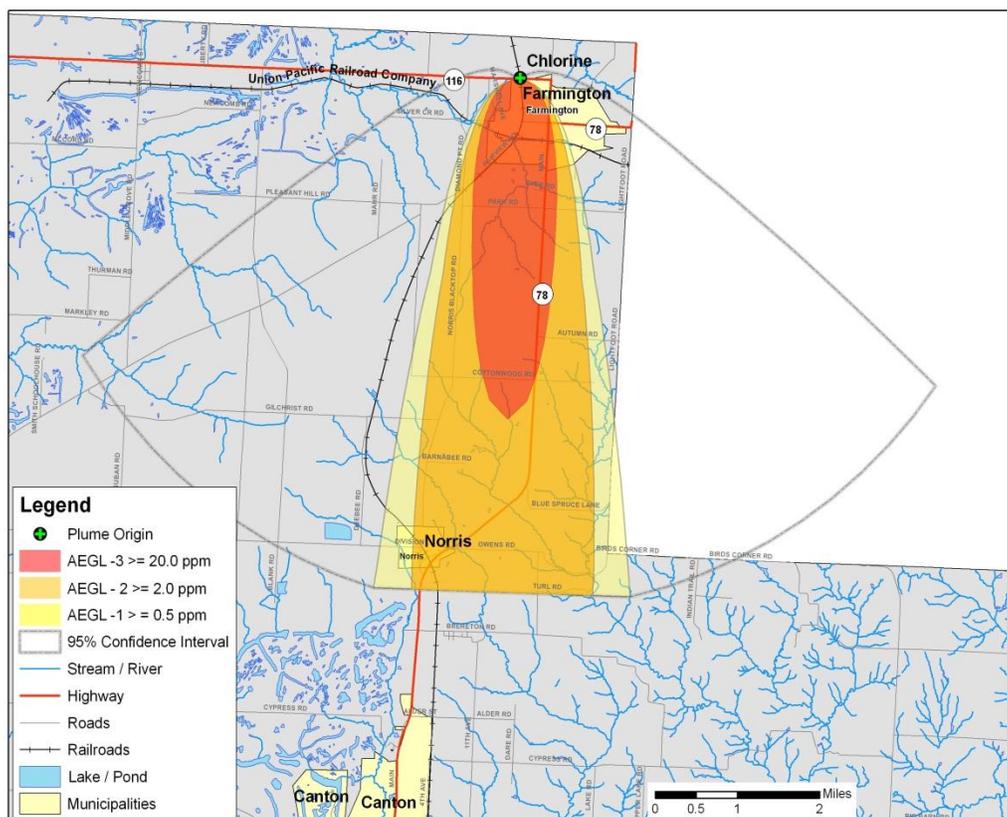
Acute Exposure Guideline Levels (AEGLs) are intended to describe the health effects on humans due to once-in-a-lifetime or rare exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). The image in Figure 4-16 depicts the plume footprint generated by ALOHA in ArcGIS.

- **AEGL 3:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death. The red buffer ( $\geq 20.0$  ppm) extends no more than four miles from the point of release after one hour.
- **AEGL 2:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape. The orange buffer ( $\geq 2.0$  ppm) extends greater than six miles from the point of release after one hour.
- **AEGL 1:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient

and reversible upon cessation of exposure. The yellow buffer ( $\geq 0.5$  ppm) extends more than six miles from the point of release after one hour.

- **Confidence Lines:** The dashed lines depict the level of confidence in which the exposure level will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

Figure 4-16: ALOHA Plume Footprint Overlaid in ArcGIS



### Results for Hazardous Chemical Release Analysis

An estimate of property exposed to the chlorine spill was calculated by extracting the census block aggregated replacement cost data from HAZUS-HM's database and intersecting these data with each of the AEGL levels (AEGL 3:  $\geq 20.0$  ppm, AEGL:  $\geq 2.0$  ppm and Level 1:  $\geq 0.5$  ppm.). This GIS overlay analysis estimates the full replacement cost of the buildings exposed to the chlorine plume are over \$111 million. The results by AEGL level are presented in Table 4-31.

Table 4-31: Estimated Building Exposure for all AEGL Zones (x 1000)

Occupancy	AEGL 1	AEGL 2	AEGL 3
Residential	\$15,589	\$30,365	\$39,194
Commercial	\$2,521	\$6,300	\$6,683
Industrial	\$237	\$375	\$3,076
Agriculture	\$130	\$979	\$561
Religious	\$760	\$1,432	\$361

Occupancy	AEGL 1	AEGL 2	AEGL 3
Government	\$4,400	\$2,049	\$385
Education	\$0	\$0	\$0

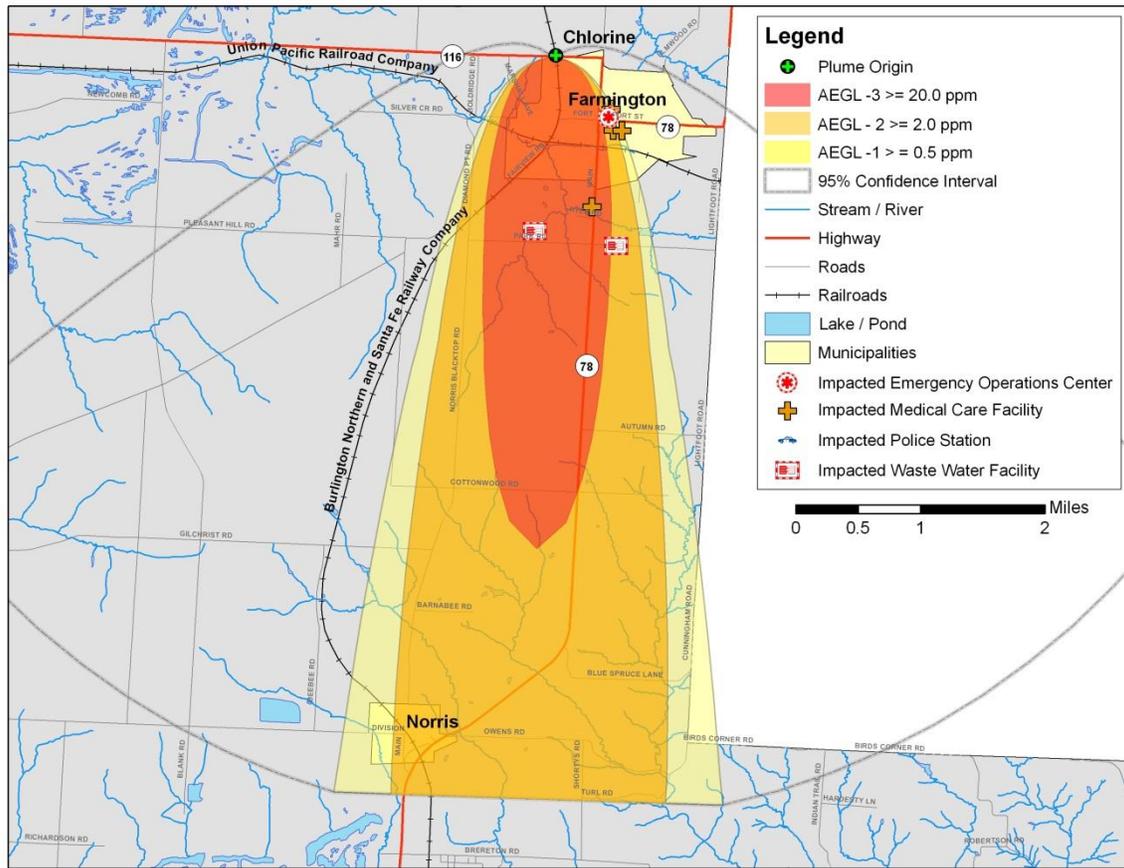
**Critical Facilities Damage**

There are eight critical facilities within the limits of the chemical spill plume. The affected facilities are identified in Table 4-32 and in Figure 4-17.

**Table 4-32: Essential Facilities within Plume Footprint**

Critical Facility	Facility Name
Emergency Operations Centers	Farmington ESDA
Waste Water Treatment Plant	Farmington Sewer Department
	Farmington Sewerage Treatment Plant
Medical Care Facilities	Farmington Country Manor
	Graham Medical Group
	Mark Baylor Clinic
	Methodist Clinic
Police Stations	Farmington Police Department
Fire Stations	Copperas Creek FPD (Norris Station)

Figure 4-17: Map of Essential Facilities Located within the Plume Footprint in Farmington, IL



**Building Inventory Damage**

Table 4-10 lists the building exposure in terms of type and number of buildings for the entire county. Buildings within the county can all expect impacts similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g., a damaged home will no longer be habitable causing residence to seek shelter).

**Vulnerability to Future Assets/Infrastructure of Hazardous Materials**

**Storage and Transportation Hazard**

Any new development within the county will be vulnerable to these events, especially development along major roadways.

**Suggestion for Community Development Trends**

Because the hazardous material hazard events may occur anywhere within the county, future development will be impacted. The major transportation routes and the industries located in Fulton County pose a threat of dangerous chemicals and hazardous materials release.

**References**

Bauer, R.A., Su, W., 2007, Soil Site Class Map Production for Comprehensive Seismic Loss Modeling for the State of Illinois. Illinois Geologic Survey.

National Climatic Data Center (NCDC). 2008. The Storm Events Database. <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms>, last accessed August, 21, 2008.

National Oceanic and Atmospheric Administration (NOAA). 2011. Fujita Tornado Damage Scale. <http://www.spc.noaa.gov/faq/tornado/f-scale.html>, last accessed December 16, 2011.

Stover, C.W., Coffman J.L. 1993, Seismicity of the United States, 1568-1989 (Revised), U.S. Geological Survey Professional Paper 1527. United States Government Printing Office, Washington.

United States Geologic Survey (USGS). 2008. Earthquake Hazards Program, Magnitude / Intensity Comparison. [http://earthquake.usgs.gov/learning/topics/mag\\_vs\\_int.php](http://earthquake.usgs.gov/learning/topics/mag_vs_int.php), last accessed, July 10, 2008.

United States Geologic Survey (USGS). 2008. Earthquake Hazards Program, Illinois Earthquake History. <http://earthquake.usgs.gov/regional/states/illinois/history.php>, last accessed, July 10, 2008.

United States Geologic Survey (USGS). 2007. Earthquake Hazard in the Heart of America. [http://pubs.usgs.gov/fs/2006/3125/pdf/FS06-3125\\_508.pdf](http://pubs.usgs.gov/fs/2006/3125/pdf/FS06-3125_508.pdf), last accessed July 10, 2008.

United States Geologic Survey (USGS). 2006. 2006 Shake Map Manual: Technical Manual, User's Guide and Software Guide. <http://pubs.usgs.gov/tn/2005/12A01/pdf/5087m12-A1.pdf>

## Section 5 Mitigation Strategies

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. Overall, mitigation strategies attempt to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment (Section 4). Mitigation should be an ongoing process, adapting over time to accommodate a community’s needs.

### 5.1 Community Capability Assessment

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities listed in Section 2 of this plan.

#### 5.1.1 National Flood Insurance Program (NFIP)

Fulton County and the communities of Canton, Lewistown, Banner, Liverpool, London Mills, and Smithfield are members of the NFIP. The village of Astoria does not have an identified flood hazard boundary, therefore does not participate in the NFIP. The communities of Cuba and Ipava are in Non-Special Flood Hazard Areas (NSFHA), which is an area that has low-to-moderate risk flood zones and is not in immediate danger of flooding caused by overflowing rivers or hard rains. Communities with a flood risk who choose not to participate in the NFIP include the City of Farmington and the Villages of Avon, Bryant, Ellisville, and St. David. Fulton County will continue to educate these jurisdictions on the benefits of the program. The Villages of Astoria, Dunfermline, Fairview, Marietta, Norris, Table Grove and Vermont do not have identified flood hazard boundaries, and therefore choose not to participate in the NFIP. A summary of additional information for Fulton County participation in the NFIP are listed in Table 5-1.

HAZUS-MH identified 323 households located within the Fulton County Special Flood Hazard Area; 61 households paid flood insurance, insuring \$4,271,000 in property value. The total premiums collected amounted to \$32,040, which on average was \$1,104.8 annually. From 1978 through 2007, 468 claims were filed totaling \$32,040. The average claim was \$5,657.

The county and incorporated areas do not participate in the NFIP’S Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: 1) reduce flood losses; 2) facilitate accurate insurance rating; and 3) promote the awareness of flood insurance.

**Table 5-1:** Additional Information on Communities Participating in the NFIP

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Floodplain Ordinance
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Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Floodplain Ordinance
Fulton County	1/17/1986	02/04/2011	N/A	N/A	11/2/2010
Village of Astoria		02/04/2011	N/A	N/A	
Village of Avon		02/04/2011	N/A	N/A	
Village of Banner	7/2/1981	02/04/2011	N/A	N/A	
Village of Bryant		02/04/2011	N/A	N/A	
City of Canton	7/3/1985	02/04/2011	N/A	N/A	
City of Cuba	1/19/1983	NSFHA	N/A	N/A	
Village of Dunfermline		02/04/2011	N/A	N/A	
Village of Ellisville		02/04/2011	N/A	N/A	
Village of Fairview		02/04/2011	N/A	N/A	
City of Farmington		02/04/2011	N/A	N/A	
Village of Ipava	6/30/1976	NSFHA	N/A	N/A	
City of Lewistown	10/5/1984	02/04/2011	N/A	N/A	
Village of Liverpool	8/15/1981	02/04/2011	N/A	N/A	
Village of London Mills	10/15/1982	02/04/2011	N/A	N/A	
Village of Marietta		02/04/2011	N/A	N/A	
Village of Norris		02/04/2011	N/A	N/A	
Village of St. David		02/04/2011	N/A	N/A	
Village of Smithfield	3/18/1985	02/04/2011	N/A	N/A	
Village of Table Grove		02/04/2011	N/A	N/A	
Village of Vermont		02/04/2011	N/A	N/A	

\*NFIP status and information are documented in the Community Status Book Report updated on 3/14/2011.

## 5.2 Mitigation Goals

In Section 4 of this plan, the risk assessment identified Fulton County as prone to several hazards. The mitigation planning team members understand that although hazards cannot be eliminated altogether, Fulton County can work toward building disaster-resistant communities. Following are a list of goals, objectives, and actions. The goals represent long-term, broad visions of the overall vision the county would like to achieve for mitigation. The objectives are strategies and steps that will assist the communities in attaining the listed goals.

### Goal 1: Lessen the impacts of hazards to new and existing infrastructure

- (a) Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.
- (b) Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.
- (c) Objective: Minimize the amount of infrastructure exposed to hazards.
- (d) Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.
- (e) Objective: Improve emergency sheltering in Fulton County.

### Goal 2: Create new or revise existing plans/maps for Fulton County

- (a) Objective: Support compliance with the NFIP for each jurisdiction in Fulton County.
- (b) Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.
- (c) Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.

### Goal 3: Develop long-term strategies to educate Fulton County residents on the hazards affecting their county

- (a) Objective: Raise public awareness on hazard mitigation.
- (b) Objective: Improve education and training of emergency personnel and public officials.

### 5.3 Mitigation Actions/Plans

Upon completion of the risk assessment and development of the goals and objectives, the mitigation planning committee was provided a list of the six mitigation measure categories from the FEMA State and Local Mitigation Planning how-to-guides. The measures are listed as follows:

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream-corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects:** Actions that involve the construction of structures to reduce the impacts of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held September 21, 2010, mitigation planning team were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The planning team brought their mitigation ideas to Meeting #4 which was held March 4, 2011. FEMA uses their evaluation criteria STAPLE+E (stands for social, technical, administrative, political, legal, economic and environmental) to assess the developed mitigation strategies.

#### Social:

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

#### Technical:

- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

#### Administrative:

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

**Political:**

- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

**Legal:**

- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolution in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation strategy address continued compliance with the NFIP?

**Economic:**

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be “tabled” for implementation until outside sources of funding are available?

**Environmental:**

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

## 5.4 Implementation Strategy and Analysis of Mitigation Projects

Implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step is to decide, based upon many factors, which action will be undertaken first. In order to pursue the top priority first, an analysis and prioritization of the actions is important. Some actions may occur before the top priority due to financial, engineering, environmental, permitting, and site control issues. Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

In Meeting #4, the planning team prioritized mitigation actions based on a number of factors. The factors were the STAPLE+E criteria listed in Table 5-2. A rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 5-3.

**Table 5-2:** Summary of STAPLE+E Criteria

<b>S – Social</b>	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community’s social and cultural values.
<b>T – Technical</b>	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
<b>A – Administrative</b>	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
<b>P – Political</b>	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
<b>L – Legal</b>	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
<b>E – Economic</b>	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
<b>E – Environmental</b>	Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community’s environmental goals, have mitigation benefits while being environmentally sound.

For each mitigation action related to infrastructure, new and existing infrastructure was considered. Additionally, the mitigation strategies address continued compliance with the NFIP. While an official cost-benefit review was not conducted for any of the mitigation actions, the estimated costs were discussed. The overall benefits were considered when prioritizing mitigation items from high to low. An official cost-benefit review will be conducted prior to the implementations of any mitigation actions. Table 5-3 presents mitigation projects developed by the planning committee, as well as actions that are ongoing or already completed. Since this is the first mitigation plan developed for Fulton County, there are no deleted or deferred mitigation items.

**Table 5-3:** List of Fulton County Mitigation Strategies Developed at Meeting 4 in Canton, IL

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Distribute weather radios to critical facilities	<p><u>Goal:</u> Improve emergency communication with Public</p> <p><u>Objective:</u> Equip public facilities and communities to guard against damage caused by secondary effects of hazards</p>	Tornado, Thunderstorms, Winter Storms	Countywide	Complete	Critical facilities throughout the county are equipped with weather radios.
Organize Mass-Communication using Social Networks (e.g. Facebook and twitter)	<p><u>Goal:</u> Improve emergency communication with Public</p> <p><u>Objective:</u> Equip public facilities and communities to guard against damage caused by secondary effects of hazards</p>	All Hazards	Countywide	Complete	Public able to obtain free access to these resources, however internet access/cellphones are required.
Lightning warning systems for outdoor facilities	<p><u>Goal:</u> Lessen the impacts of lightning strikes at outdoor-recreational areas</p> <p><u>Objective:</u> Minimize potential risk from severe weather at outdoor-recreational areas</p>	Thunderstorms/Lightning	Canton	Complete	Lightning warning sirens are located at parks and schools within Canton. There is interest in increasing the number of lightning warning sirens for the rest of Fulton County.
Establish mutual aid agreement with regional response team	<p><u>Goal:</u> Develop long-term strategies to educate the community residents on the hazards affecting their county</p> <p><u>Objective:</u> Improve education and training of emergency personnel and public officials</p>	All Hazards	Countywide	Complete	The ESDA director will work with neighboring counties to establish the agreements. If resources are available, implementation will begin within one year.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Remove exposed infrastructure on county floodplains	<p><u>Goal:</u> Lessen the impacts of flooding to homes and business on Fulton County floodplains</p> <p><u>Objective:</u> Support compliance with the NFIP for each jurisdiction in Fulton County</p>	Flood	Emiquon and Liverpool, IL	Complete	Emiquon was bought from The Nature Conservancy (TNC) in 1993 and converted into a National Wildlife Refuge. Several homes were bought in Liverpool after the 2008 floods.
Connect with the National Weather Service (NWS) for HAZMAT	<p><u>Goal:</u> Reduce impacts of chemical spill</p> <p><u>Objective:</u> Equip the emergency managers with the needs to react to chemical spills within their communities</p>	HAZMAT	Countywide	Complete	The NWS works with emergency management officials to model chemical spills. Quick access to this tool assists in mass communication and potential evacuation strategies for the affected communities.
Implement Nixle for mass media release via e-mail and text messages; advertise to the public for participation	<p><u>Goal:</u> Enhance County's Emergency Notification System</p> <p><u>Objective:</u> Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county</p>	All Hazards	Countywide	Testing	The county will implement Nixle, pending the current testing phase. Funding for advertisement of the system will be sought from FEMA. If funding is available, implementation will begin within one year.
Upgrade warning siren capability	<p><u>Goal:</u> Lessen the impacts of severe weather to at-risk communities</p> <p><u>Objective:</u> Improve the current siren system to maximize efficiency.</p>	Severe Thunderstorm, Tornado	Countywide	High	Local resources will be used to evaluate, install, and maintain the warning siren systems. Additional funding will be sought from other funding sources (e.g. PDM program) to expand the warning system coverage area.
Distribute weather radios to homes	<p><u>Goal:</u> Improve emergency communication with Public</p> <p><u>Objective:</u> Equip homes with the ability to guard against damage caused by secondary effects of hazards</p>	Tornado, Severe Thunderstorm, Winter Storm	Countywide	High	The County ESDA will head this project. Funding will be sought from local, state and federal resources to purchase weather radios for mass-distribution throughout the county.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Construct and/or improve storm shelters in mobile home parks	<p><u>Goal:</u> Lessen the impacts of hazards to new and existing infrastructure</p> <p><u>Objective:</u> Improve emergency sheltering in the community.</p>	Tornado, Severe Thunderstorm, Winter Storm	Countywide	High	Local resources will be used to evaluate and determine areas to construct and/or update storm shelters for mobile home parks. Funding will be sought from local, state, and federal resources to complete the project.
Develop ordinances to bury new power lines in subdivisions	<p><u>Goal:</u> Lessen the impacts of hazards to new and existing infrastructure</p> <p><u>Objective:</u> Minimize the amount of infrastructure exposed to hazards.</p>	Tornado, Severe Thunderstorm, Winter Storm	Countywide	High	Although there is not a formal ordinance in place, new subdivisions typically bury power lines. The county will propose development of ordinances to require this practice for all future infrastructures. Local resources will be used to develop the ordinances.
Public education on the benefits of weather radios	<p><u>Goal:</u> Educate the public about weather radio benefits, and thereby increase the number of radios in homes</p> <p><u>Objective:</u> Develop an education platform to educate the community about the benefits of weather radios and how to obtain one</p>	Tornado, Severe Thunderstorm, Winter Storm	Countywide	Medium	As of March 2011, there is no current funding for this project. Funding will be sought from the disaster mitigation funds upon approval of the Multi-Hazard Mitigation Plan.
Enforce codes requiring mobile homes to have tie-downs	<p><u>Goal:</u> Create new or revise existing plans/maps for the community</p> <p><u>Objective:</u> Review and update existing community plans and ordinances to support hazard mitigation.</p>	Tornado, Severe Thunderstorm, Winter Storm	Countywide	Medium	Local resources will be used to review existing codes and research new options. Implementation will begin within five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Implement natural snow fences/tree barriers	<p><u>Goal:</u> Lessen the impacts of hazards to new and existing infrastructure</p> <p><u>Objective:</u> Minimize the amount of infrastructure exposed to hazards.</p>	Winter Storm	Countywide	Medium	<p>Local resources and ILDOT will be used for funding. If funding is available, implementation will begin within five years.</p> <p>Locations: County Hwy 2, IL9, IL136</p>
Harden schools and older infrastructure	<p><u>Goal:</u> Lessen the impacts of hazards to new and existing infrastructure</p> <p><u>Objective:</u> Retrofit schools with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.</p>	Tornado, Severe Thunderstorm	Countywide	High	Local resources will be used to identify the required structures to be hardened. Funding has not been secured as of 2011, but the pre-disaster mitigation program and community development grants are possible funding sources.
Lightning warning systems for outdoor facilities	<p><u>Goal:</u> Lessen the impacts of lightning strikes at outdoor-recreational areas</p> <p><u>Objective:</u> Minimize potential risk from severe weather at outdoor-recreational areas</p>	Thunderstorms/Lightning	Countywide	Low	Local resources will be used to identify locations where lightning sirens are needed, particularly at schools and parks. Canton already has several lightning warning systems.
Emergency action plan for ethanol plant in Fulton County	<p><u>Goal:</u> Create an emergency action plan/maps to potential chemical release</p> <p><u>Objective:</u> Lessen the impacts and minimize the exposure to the community from chemical release</p>	HAZMAT	Canton	Medium	The County ESDA will work with leaders from the ethanol plant to develop an emergency action plan for the immediate surrounding area. Plan will include traffic routing, emergency alerts, and evacuation.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Purchase generators and/or transfer switches to provide back-up power to critical facilities & community shelters	<p><u>Goal:</u> Lessen the impacts of hazards to new and existing infrastructure</p> <p><u>Objective:</u> Improve emergency sheltering in the community.</p>	All Hazards	Countywide	Medium	The County and other jurisdictions will oversee the implementation of this project. Local resources will be used to determine which facilities should receive generators. Funding has not been secured as of 2011, but the pre-disaster mitigation program and community development grants are possible funding sources.
Conduct an engineering study to identify and map areas of subsidence and the steam tunnel (Canton)	<p><u>Goal:</u> Create new or revise existing plans/maps for the community</p> <p><u>Objective:</u> Review and update existing, or create new, community plans and ordinances to support hazard mitigation.</p>	Subsidence	Countywide	Low	The County Engineer will oversee this project. The county will seek assistance from IEMA and community grants to fund the study. Subsidence will be mapped county-wide. The steam tunnel is located in Canton, but there is no known exact location.
Establish ordinances to restrict development in undermined areas in the county	<p><u>Goal:</u> Create new or revise existing plans/maps for the community</p> <p><u>Objective:</u> Review and update existing, or create new, community plans and ordinances to support hazard mitigation.</p>	Subsidence	Countywide	Medium	The county will seek assistance from IEMA and community grants to develop the ordinances.
Add levees to at-risk community of Bernadott, IL	<p><u>Goal:</u> Lessen impacts of flooding to at-risk communities</p> <p><u>Objective:</u> Construct levees to reduce the flood waters that inundate Bernadott</p>	Flood	Bernadott	Medium	The county ESDA will work with the village of Bernadott to establish a plan for constructing levees. Funding will be sought from FEMA and other resources.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Raise roads that are frequently inundated	<p><u>Goal:</u> Lessen impacts from flash flooding along county roads</p> <p><u>Objective:</u> Raise roads that are frequently inundated from heavy rainfall</p>	Flood	Countywide	Medium	<p>The county engineer will work with local officials to determine at-risk roads. Funding will be sought from various sources.</p> <p>Current Known Locations: IL136</p>
Conduct a levee assessment and reconstruction plan	<p><u>Goal:</u> Update plans/maps for communities along floodplains based on levee stability</p> <p><u>Objective:</u> Conduct a study to comprehend levee stability and potential costs in levee repairs to maintain status with the NFIP</p>	Flood	Countywide	Low	<p>The city engineer and ESDA will work with drainage districts and/or the USACE to conduct a levee assessment study. Funding is not secured as of March, 2011.</p>
Construct new culvert	<p><u>Goal:</u> Lessen the impacts of flooding to new and existing infrastructure</p> <p><u>Objective:</u> Minimize the amount of infrastructure exposed to hazards</p>	Flood	Bernadott	Medium	<p>The county engineer and local officials will create a plan for culvert construction. As of March 2011, no funding is available. Local and state funding resources will be sought.</p> <p>Current Known Locations: County Hwy 2, in Bernadott</p>
Establish swing gates along frequently flooded roads	<p><u>Goal:</u> Lessen the impacts from flooding to drivers in the community</p> <p><u>Objective:</u> Minimize the effects of flooding along frequently inundated roads by restricting driver's access.</p>	Flood	Countywide	High	<p>The county engineer and local officials will create a plan for swing gate construction. As of March 2011, no funding is available. Local and state funding resources will be sought.</p> <p>Current Known Locations: County Hwy 2, in London Mills</p>

The Fulton County Emergency Services and Disaster Agency will be the local champions for the mitigation actions. The County Commissioners and the city and town councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions.

### **5.5 Multi-Jurisdictional Mitigation Strategy**

As a part of the multi-hazard mitigation planning requirements, at least two identifiable mitigation action items have been addressed for each hazard listed in the risk assessment and for each jurisdiction covered under this plan.

Each of the 20 incorporated communities within and including Fulton County was invited to participate in brainstorming sessions in which goals, objectives, and strategies were discussed and prioritized. Each participant in these sessions was armed with possible mitigation goals and strategies provided by FEMA, as well as information about mitigation projects discussed in neighboring communities and counties. All potential strategies and goals that arose through this process are included in this plan. The county planning team used FEMA's evaluation criteria to gauge the priority of all items. A final draft of the disaster mitigation plan was presented to all members to allow for final edits and approval of the priorities.

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## Section 6 Plan Maintenance

### 6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Fulton County Emergency Services and Disaster Agency (ESDA) will reconvene the mitigation planning team to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during 2017, to address the five-year update of this plan.

Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the county goals and objectives to determine their relevance to changing situations in the county. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by the county commissioners.

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. This updated Hazus-MH GIS data has been returned to the county for use and maintenance in the county's system. As newer data becomes available, these updated data will be used for future risk assessments and vulnerability analyses.

### 6.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts since many of the mitigation projects identified as part of this planning process are ongoing. Fulton County and its incorporated jurisdictions will update the zoning plans and ordinances listed in Table 5-2 as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

### 6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the ESDA Coordinator and forwarded to the mitigation planning team for discussion. Education efforts for hazard mitigation will be ongoing through the ESDA. The public will be notified of periodic planning meetings through notices in the local newspaper. Once adopted, a copy of this plan will be maintained in each jurisdiction and in the county ESDA Office.

## Acronyms

**A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

### A

AEGL – Acute Exposure Guideline Levels  
ALOHA – Areal Locations of Hazardous Atmospheres

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### B

BFE – Base Flood Elevation

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### C

CAMEO – Computer-Aided Management of Emergency Operations  
CEMA – County Emergency Management Agency  
CEMP – Comprehensive Emergency Management Plan  
CERI – Center for Earthquake Research and Information  
CRS – Community Rating System

---

### D

DEM – Digital Elevation Model  
DFIRM – Digital Flood Insurance Rate Map  
DMA – Disaster Mitigation Act of 2000

---

### E

EAP – Emergency Action Plan  
EMA – Emergency Management Agency  
EPA – Environmental Protection Agency  
ERPG – Emergency Response Planning Guidelines  
ESDA – Emergency Services Disaster Agency

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### F

FEMA – Federal Emergency Management Agency  
FIRM – Flood Insurance Rate Maps  
FIS – Flood Information Study

---

### G

GIS – Geographic Information System

**H**

Hazus-MH – Hazards USA Multi-Hazard  
HUC – Hydrologic Unit Code

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**I**

IDNR – Illinois Department of Natural Resources  
IDOT - Illinois Department of Transportation  
IEMA – Illinois Emergency Management Agency  
IUPUI – Indiana University – Purdue University, Indianapolis

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**M**

MHMP – Multi-Hazard Mitigation Plan  
MOU – Memorandum of Understanding

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**N**

NCDC – National Climatic Data Center  
NEHRP – National Earthquake Hazards Reduction Program  
NFIP – National Flood Insurance Program  
NOAA – National Oceanic and Atmospheric Administration

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**P**

PPM – Parts Per Million

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**R**

RPI – Risk Priority Index

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**S**

SIUC – Southern Illinois University - Carbondale  
SPC – Storm Prediction Center  
SWPPP – Storm water Pollution Prevention Plan

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**U**

USGS – United States Geological Survey

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## Appendices

**Appendix A. MHMP Meeting Minutes**

**IEMA Pre-Disaster Mitigation Plan**

**Assembly of the Fulton County Planning Team Meeting 1:  
Chairman: Chris Helle, Fulton County ESDA  
Plan Directors: SIUC Geology Department and IUPUI - Polis**

**Meeting Date:** February 4, 2010

**Meeting Time:** 2 pm

**Place:** Fulton County Health Department, Canton, IL

**Planning Team/Attendance:**

Jonathan Remo	SIUC Geology
Megan Carlson	SIUC Geology
Kevin Delmastaq	OSF Saint Francis
John Buechler	Polis Center
Rick Nicholas	Canton PD
Chris Helle	Fulton ESDA
Jane Brewer	American Red Cross
Phil Fleming	City of Canton – ESDA
Gordon James	Fulton County Health Department – Emergency Planner
Tom Shuberry	Canton Fire Department

**Introduction to the Pre-Disaster Mitigation Planning Process**

The meeting is called to order

Narrative: A power-point presentation was given by Jonathan Remo. He explained that this project is in response to the Disaster Mitigation Act of 2000. The project is funded by a grant awarded by FEMA. A twenty-five percent match will be required from the county to fund this project. The county match will be met by sweat equity and GIS data acquired from the County Assessor's Office. The sweat equity will be an accumulation of time spent at the meetings, on research assignments, surveys, along with the time spent reviewing and producing the planning document.

Jonathan Remo introduced the Pre-Disaster Mitigation Website to the planning team. A username and password was given to the planning team, which will grant them access to the web site. The web site is used to schedule meetings, post contact information and download material pertaining to the planning process.

Jonathan Remo divided the planning project into five to six meetings. At the 1<sup>st</sup> meeting, the planning team will review critical facility maps. The planning team will be asked to research

and verify the location of all critical facilities within the county. Jonathan stated that public participation is very important throughout the planning process. He explained that all of the meetings are open to the public but there will be a particular effort made to invite the public to the 3<sup>rd</sup> meeting. At that meeting, the SIUC Geology Department will present historic accounts of natural disasters that have affected this area. At the 2<sup>nd</sup> meeting the discussion will focus on natural disasters that are relevant to this area. These hazards will be given a probability rating and ranked by their occurrence and potential level of risk. Polis and SIUC Geology will research these hazards and present them to the planning team. The 3<sup>rd</sup> meeting is publicized in order to encourage public participation. Polis and SIUC Geology will produce a risk assessment in draft form; each planning team member will get a copy. Also they will present strategies and projects that FEMA and other counties have undertaken for the planning team to review. The 4<sup>th</sup> meeting consists of a brain storming session focused on disasters that were analyzed in the risk assessment report. The Planning Team will list strategies and projects that could be implemented to mitigate the potential hazards that threaten the county. FEMA requires that for every identified hazard, a strategy to mitigate the loss and damage must be in place. The strategies may range from educational awareness to hardening a building or building a levee. After the 4<sup>th</sup> meeting the plan will be in its final draft form. At the 5<sup>th</sup> meeting the planning team will need to review the plan prior to sending it to IEMA. IEMA will review the plan and will make recommendation to it as they see fit, then it is submitted to FEMA for review and approval. Once the plan has been submitted to FEMA, local governments are eligible to apply for grants to mitigate these established hazards. After FEMA approves the plan, it is sent back to the Planning Team. At the 6<sup>th</sup> meeting the Planning Team will present the Pre-Disaster Mitigation Plan to the County Board for adoption. Incorporated communities must either adopt the county plan or prepare its own plan, in order to access mitigation assistance from FEMA. The communities are encouraged to participate and contribute to development of the plan. Once the County Board has adopted the plan, each incorporated community will have the opportunity to adopt the plan as well.

Jonathan Remo then introduced Megan Carlson of SIUC. Megan Carlson presented three maps that identified critical facilities in the county. She asked the planning team to come up to review the maps to identify any corrections that need to be made to the maps. She assigned research homework arranged by categories to individual planning team members to locate missing or incorrect critical facilities.

Meeting was adjourned.

county Fulton Date 2/4/2010 Location Fulton County Health Department

Name	Affiliation	E-mail	Phone Number
Kevin Delmastro	OSF Saint Francis / R MERT	Kevin.M.Delmastro@osfhealthcare.org	(309) 303-6449
John Dueckley	Polis Center	Jobuech17@upui.edu	317-278-2433
Rick Nichols	Canton P.D.	RNICHOLS@CANTONIL.MIL.GOV	224-6601
Chris Helle	FC ESDA		
Jane Brewer	America Red Cross	brewer.jane35@yahoo.com	309-647-2040
Phil Fleming	City of Canton - Emergency Services and Disaster Agency	cauford@cityofcanton.org	309-224-4414
Gordon James	Fulton County Health Dept. - Emerg. Plan.	gjames@fultonco.org	309-647-1134 X2004
Tom Shubert	Canton Fire Dept.	TS@fire.cantonil.org	309-647-6840

**IEMA Pre-Disaster Mitigation Plan**

Assembly of the Fulton County Planning Team Meeting 2:  
 Chairman: Chris Helle, Fulton County ESDA  
 Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: July 29, 2010

Meeting Time: 2 pm

Place: Fulton County Health Department, Canton, IL

**Planning Team/Attendance:**

Jonathan Remo	SIUC Geology
Beth Ellison	SIUC Geology
Kevin Delmastro	OSF St. Francis Medical Center
Chris Helle	Fulton County ESDA
Phil Fleming	Canton ESDA
Gordon James	Fulton County Health Department

**The meeting was called to order.**

Jonathan Remo began the meeting by re-introducing the objectives of the PDM Planning document. The planning document is mandated as a result of the "Disaster Mitigation Act of 2000". Jonathan stated that the objective of the meeting was to prioritize a list of disasters that are relevant to Fulton County.

Jonathan Remo provided the planning team with a handout to direct the focus of the meeting discussion. As Jonathan began to conduct the prioritizing process, he described the risk assessment ranking that FEMA has established.

Narrative: The Planning Team was then asked to assess and rank the hazards that could potentially befall Fulton County using the risk priority index (RPI). The identified hazards were ranked as followed for Fulton County:

- #1: Flooding
- #2: Tornado
- #3: Dam or Levee Failure
- #4: Thunderstorms
- #5: Winter Storms
- #6: Hazardous Materials Release
- #7: Earthquakes

Narrative: The planning team was then asked to analyze the historical weather events that have been plotted on a map of the county and communities therein. No corrections were noted by the planning team.

The planning team agreed to complete any missing information pertaining to critical facilities by the next meeting.

Meeting was adjourned.

PLEASE PRINT CLEARLY

<u>NAME</u>	<u>AGENCY/JURISDICTION</u>
Kevin Delmastro	OSF saint francis medical cent./RMERT
Chris Helle	Fulton County ESDA
Phil Fleming	Canton ESDA
Gordon James	Fulton County Health Dept.

**IEMA Pre-Disaster Mitigation Plan**

**Assembly of the Fulton County Planning Team Meeting 3:**  
**Chairman: Chris Helle, Fulton County ESDA**  
**Plan Directors: SIUC Geology Department and IUPUI - Polis**

**Meeting Date:** September 21, 2010

**Meeting Time:** 2 pm

**Place:** Fulton County Health Department, Canton, IL

**Planning Team/Attendance:**

Jonathan Remo	SIUC Geology
Beth Ellison	SIUC Geology
Michelle Florea	Graham Hospital/LEPC
Phil Fleming	Canton ESDA
Sherry Cut	Graham Hospital
Troy Erbentrauf	OSF Saint Francis Medical Center
Dave Deuter	ROE 22
Gordon James	Fulton County Health Department

**The meeting was called to order.**

Jonathan Remo opened the meeting with an overview of the planning process and the roles of SIU and the Polis Center. Then he went on to explain the topics and objectives of the current meeting. Jonathan first presented the planning team with the list of hazards that the team had ranked by their level of risk from the previous meeting. He also presented a power point presentation of the history of Fulton County's past disasters. This included covering each hazard that the County had focused on, the history of each and then the mitigation strategies. He defined mitigation as the act of avoidance and preparedness.

A draft of the Fulton County Mitigation Plan and a copy of Mitigation Ideas, produced by FEMA Region 5 in July 2002, were given to each of the planning team members for review. It was explained by Jonathan the contents of the booklet and that each of the planning team members should return to meeting 4 with three mitigation strategies for each of the hazards identified by the planning team.

Jonathan Remo then asked the audience for questions or comment. After some discussion about the plan and how it would affect the community and its residents, he thanked those who came and a closed the presentation.

Meeting was adjourned.

SIGN-IN SHEET

Meeting #3  
FULTON COUNTY

\*PLEASE PRINT CLEARLY

NAME	TOWN/JURISDICTION	TITLE
Michelle Horea	Graham Hospital / LERC	Fulton Co. LERC Chair
Phil Fleming	Canton E.S.D. #1	Coordinator
Sherry Allen	Graham	ED - Director
Teoy EBENTRAUF	OSF SAINT FRANCIS	Emergency manager
Dave Dauter	ROE 22	Asst. Reg. Supt.
Jonathan Remo	Fulton Co. Health Dept	Program Mgr.
Michelle Kimbe	Graham	VP PE Services
Nancy Ziff	FCSD	Chief Deputy

**IEMA Pre-Disaster Mitigation Plan**

Assembly of the Fulton County Planning Team Meeting 1:  
Chairman: Chris Helle, Fulton County ESDA  
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: March 4, 2011

Meeting Time: 2 pm

Place: Fulton County Health Department, Canton, IL

Jonathan Remo	SIUC Geology
Beth Elision	SIUC Geology

The meeting was called to order.

Jonathan Remo thanked everyone for attending the meeting and stated that if the planning team members needed extra mitigation strategy handbooks that they were available upon request.

Jon Remo began by explaining that today's meeting would cover mitigation strategies that the planning team believed would prevent or eliminate the loss of life and property. He explained that the planning team should not make any reservations in the form of money or resources when developing this list. Also whenever possible, the planning team was directed to be specific about the location or focus area of a strategy, in respect to being within a municipality or county wide. Each hazard was addressed one at a time. The planning team listed new and current on-going mitigation strategies in respect to each hazard. The planning team prioritized mitigation actions based on a number of factors. A rating of High, Medium, or Low was assessed for each mitigation item.

**IEMA Pre-Disaster Mitigation Plan**  
 Assembly of the Fulton County Planning Team Meeting 5:  
 Chairman: Chris Helle, Fulton County ESDA  
 Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: April 11, 2011

Meeting Time: 2 pm

Place: Fulton County Health Department, Canton, IL

Jonathan Remo	SIUC Geology
Beth Elision	SIUC Geology
Michelle Florea	Graham Hospital
Phil Fleming	Canton ESDA
Gordon James	PSM Manager
Chris Helle	Fulton ESDA
Kathie Brown	University of Illinois Extension (Fulton County)

The meeting was called to order.

Chris Helle lead the meeting. Chris introduced the final draft of the plan and asked everyone to make comments. Final comments were made and returned to SIUC for correction.

Fulton County Meeting Attendance

Meeting 5 - Mon, April 11 @ 2pm  
 Please print clearly

Jurisdiction Name	Print Name	Initial	Job Title /Company	Contact Information (e-mail address and/or phone number)
* Fulton Co.	Michelle Florea	mf	Graham Hospital	(800) 477-5200 ext. 2327 mflorea@grahamhospital.org
City of Canton	Phil Fleming	PF	Coordinator, Canton Emergency Services & Disaster Preparedness	Canton, IL 309-647- 2358
Fulton Co Health Dept	Gordon James	GJ	PSM Manager	309-647-1134 2150 S. E. Illinois, 0189
ESDA	Chris Helle	CH	ESDA	309-224-7701 ESDA@fultoncounty.org
Univ. of Ill. Ext.	Kathie Brown	KB	Univ. of Ill. Extension	Fulton Co. OCE 1601 S. Illinois, Rm. 6042 1011 N.E. Randolph, 309-477-5711

Page 9  
 Fulton County Pre-Disaster Mitigation Plan

Meeting Minutes/Attendance from Individual and Public Meetings held with Chris Helle



11/08/2011

**Fulton County ESDA**

Coordinator Chris Helle  
 Deputy Coordinator Howard Williams  
 163 S Cone Street  
 Farmington, IL 61531  
 Phone: 309-245-2991



SIGN IN SHEET

IPWMAN MEETING – HAZARDOUS MITIGATION PLAN DISCUSSION –

<u>NAME</u>	<u>AGENCY/DEPT</u>
Allen Woodruff	Pottsville Township
Alan Bell	Barrabette
Richard Ball	Banner Twp
Keith Frank	City of Canton
Nancy Mackey	City of Canton Public Works
Paul Crowe	Orion TWP
Sandy Crowe	Orion TWP
Robert E. Thomas	Cass Township
Shirley Kukul	Vermont Township
Bill Kuhse	Hwy Fr Hill County
ROBERT WRIGHT	CITY OF FARMINGTON
David Ehlers	City of Farmington
Steve Bryson	Historic
+1 Jennings	Smithfield

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**FULTON COUNTY  
LOCAL EMERGENCY PLANNING COMMITTEE MINUTES  
March 23, 2011 (postponed from 3/9/11)**

**Members Present (X):**

Hospital Representatives (Graham Hospital)	X	Michelle Florea (Chairperson)	Bob Ackerman
OSF Health Care	X	Kevin Delmastro	
Civil Defense/Emergency Management Representative (Fulton County ESDA)	X	Chris Helle, Director	
Firefighting Representative (Spoon River Valley Fire Association)	X	Jim Tunney	
Law Enforcement Representative (Fulton County Sheriff's Department)	X	Barry Blackwell (Vice-Chairperson)	
Law Enforcement Representative (Illinois State Police)		Tom Perkins	Lenny Brashear
Health Representative (Fulton County Health Department)	X	Gordon James (Secretary)	
Broadcast/Print Media Representative (Canton Daily Ledger)		John Froehling	
First Aid/EMT Representative (Fulton County EMS)		John Spotloe	
Local Environmental Representative (Fulton County Health Department)	X	Sue England	
Transportation Representative (City of Farmington Highway Department)		Dave Ehlers	
Community Groups (Fulton /Schuyler Chapter of American Red Cross)		Nancy Bentley	
Community Groups (Regional Office of Education)		Louise Bassett	Dave Demler
Owners/Operators of Regulated Facilities (Ameren Duck Creek)	X	John Mansker	Al Martos

Others in Attendance: Phil Fleming-Canton Emergency Services and Disaster Agency; Teresa Dudis, D.V.M., United States Department Of Agriculture; Anna Ruman, D.V.M., United States Department of Agriculture; Marty Brown, Fulton ETSB

1. Called to Order: 3:30p.m.

Adjourned 4:25p.m.

Location: Fulton County Health Department, 700 E Oak Street, Canton IL 61520; Room 103

Chairperson: M Florea

Recording Secretary: G James

**MINUTES**

The minutes of the January 12, 2011 meeting were reviewed and amendments were made. Motion by K Delmastro; second by C Helle. By voice vote the minutes were approved.

**LEPC Business.**

1. Introductions were made.
2. G James presented the new format for sign-in and minutes to more accurately reflect participation in the meeting. James also stated that he would send copies of the sign-in sheet at the same time minutes were sent to members.

**REPORTS**

**A. Fire**

1. J Tunney announced that Dick Wilson was no longer Smithfield fire chief and that two trustees on their board has also resigned.

**B. Fulton County ESDA**

1. Haz Mit – C Helle reported that the grant application was proceeding nicely. He distributed a mitigation document and asked for review and comments.
2. SAR Drill – C Helle announced the event and gave an update of the drill.

3. Snowstorm – A meeting will be held 3/28 in Peoria for all agencies who have submitted claims for reimbursement. Helle indicated it was very important that persons attend this meeting and if they could not to let him know.
4. Catastrophic Animal Incidents – C Helle introduced Teresa Dudis, D.V.M. and Anna Ruman, D.V.M. from the U.S. Department of Agriculture. Dudis presented a power point detailing possibilities of events associated with sick, dying and dead animals. Handouts: Catastrophic Animal Burial Pit Locations (map) and Guidelines for Developing an Animal Emergency Annex For County Emergency Operations Plans. Handouts and other materials are available from C Helle.

**C. Fulton County Health Department**

1. G James reported that narrow-banding of the FCHD Starcom radio will occur next week.
2. The Cuba United Methodist Church would like to be involved in emergency preparedness and will volunteer their site as a shelter. James will contact the church and encourage involvement with Fulton/Schuyler Red Cross.
3. The Illinois Emergency Preparedness Summit will be held June 21-23 in Lombard. Registration is now open on the website.

**D. Graham Hospital**

1. M Florea announced that the hospital is in the early stages of a full scale exercise following the exercise held earlier this year. Tentatively set for May or June, 2011.

**E. Other**

1. K Delmastro indicated that there will be an Airport Drill on April 9 2011.

**F. Adjourn**

A motion was made by C Helle and seconded by B Blackwell for adjournment.

**THE NEXT LEPC MEETING WILL BE WEDNESDAY MAY 11, 2011, 3:30 PM ROOM 307 OF  
THE FULTON COUNTY HEALTH DEPARTMENT**



163 S Cone St  
Farmington, IL  
61531

Phone: 309-224-7701  
Fax: 309-245-5126  
Email: ESDA@farmingtonil.com



**FULTON COUNTY ESDA**

Director: Chris Helle  
Deputy Director: Howard Williams

10/14/2010

**MAYOR MEETING**

Please sign in to confirm receipt of the draft hazardous mitigation plan for Fulton County

NAME	TOWN REPRESENTED
Terry Miugus	AVON
Tony Roland	DCEO
Kevin Meade	Canton
Bud Stobauch	Farmington
Rex Lewis	Fulton Co Workshop Transportation
Bill Vantix	Ellisville
Steve Brunson	Ipaug

**Appendix B. Local Newspaper Articles**

# CantonDailyLedger.com

## Public meeting scheduled on multi-hazard mitigation plan

**Canton Daily Ledger**  
 Posted Sep 17, 2010 @ 08:56 PM

CANTON — The Fulton County Multi-Hazard Mitigation Steering Committee will host a public information and strategy planning session at 2 p.m. on Tuesday, Sept. 21 at the Fulton County Health Department, 700 East Oak Street. The public is invited and encouraged to attend.

“Through a grant, Fulton County ESDA has formed an alliance with Southern Illinois University-Carbondale (SIUC) and the Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) to identify potential natural hazards and to produce a mitigation plan to address the issues,” explains Fulton County Emergency Services Disaster Agency Director Chris Helle. Helle says the ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for McDonough County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Over the last several months the planning team has been working with staff from the SIUC Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency for approval. The Federal Emergency Management Agency (FEMA) now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the Fulton County plan is critical, explains Helle.

The MHMP’s will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities and unincorporated areas of the county.

Continued on A-10

Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The planning team has identified the following hazards: tornados, thunderstorms-high winds-hail, severe winter storms, hazardous materials release, drought-extreme heat, floods and earthquake.

The planning team then selected hazards for SIUC to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others, states Helle.

Once the plan is completed, the planning team will submit it to FEMA for approval.

The planning team will also work to develop funding for any mitigation activities that are identified.

The public is invited to attend the meeting and the planning team is interested in receiving public input on the plan, emphasizes Helle.

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## **Appendix C. Adopting Resolutions**

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Fulton County recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Fulton County participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Fulton County hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

\_\_\_\_\_  
Village Council Member

\_\_\_\_\_  
Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, City of Canton recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, City of Canton participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that City of Canton hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, City of Farmington recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, City of Farmington participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that City of Farmington hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Village of Astoria recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Village of Astoria participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Village of Astoria hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Village of Avon recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Village of Avon participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Village of Avon hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Village of Ipava recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Village of Ipava participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Village of Ipava hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

\_\_\_\_\_  
Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Village of Ellisville recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Village of Ellisville participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Village of Ellisville hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

**Resolution # \_\_\_\_\_**

**ADOPTING THE FULTON COUNTY MULTI-HAZARD MITIGATION PLAN**

WHEREAS, Village of Smithfield recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Village of Smithfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Village of Smithfield hereby adopts the Fulton County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that The Fulton County Emergency Services and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS \_\_\_\_\_ Day of \_\_\_\_\_, 2011.

\_\_\_\_\_  
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

## **Appendix D. Historical Hazards Map**

-See Attached Large-Format Maps

## **Appendix E. List of Critical Facilities**

## Airport Facilities Report

ID	Name	Address	City	Class	Function	Capacity	YearBuilt	ReplaCost
1	INGERSOLL		CANTON	ADFLT	PUBLIC			10651

## Communication Facilities Report

ID	Name	Address	City	Class	Owner	Function	ReplaCost
1	WBYS 1560		CANTON	CBR	WPW	AM	111
2	WBYS-FM CH 300		CANTON	CBR	WPW	FM	111
3	WQBM718	DUCK CREEK STA 6 MI SE	CANTON	CDFLT	AMEREN		0
4	WQBM718		CANTON	CDFLT	AMEREN		0
5	KZA281	DUCK CREEK POWER PLANT 6 MI SE	CANTON	CDFLT	Ameren Services		0
6	KSF517	SR 78 1.4 MI S	CANTON	CDFLT	Ameren Services		0
7	KSN983	DUCK CREEK STA 6 MI SE	CANTON	CDFLT	Ameren Services		0
8	KSN983		CANTON	CDFLT	Ameren Services		0
9	WQIV595	RT 18 .3 Mi N of IL RT 16	Farmingt	CDFLT	Ameren Services		0
10	WQIV595	1 mile north of Blyton,IL	Blyton	CDFLT	Ameren Services		0
11	KZU918	414 NORTH 1ST ST	CANTON	CDFLT	AMERICAN		0
12	KNAQ954	.12 KM N US RT 24	ASTORIA	CDFLT	ASTORIA		0
13	KNAQ954		ASTORIA	CDFLT	ASTORIA		0
14	WNRL271	COR OF WALNUT AND STATE STS	ASTORIA	CDFLT	ASTORIA FIRE		0
15	WNRL271		ASTORIA	CDFLT	ASTORIA FIRE		0
16	WNPB689	163 N WALNUT ST	ASTORIA	CDFLT	ASTORIA READY		0

17	WNPB689		Astoria	CDFLT	ASTORIA READY	0
18	WNPB689	200 S CENTER ST	ASTORIA	CDFLT	ASTORIA READY	0
19	WNPB689		ASTORIA	CDFLT	ASTORIA READY	0
20	WLL492	1.6 MI ESE OF	NORRIS	CDFLT	AT&T	0
21	WLL492	1.6 MI ESE OF	NORRIS	CDFLT	AT&T	0
22	WPZX885	323 E. COURTLAND	AVON	CDFLT	AVON FIRST	0
23	WPZX885		AVON	CDFLT	AVON FIRST	0
24	WPLT803			CDFLT	AVON, VILLAGE	0
25	WPBV258			CDFLT	AZBELL, KIM	0
26	WNYN773	1/4 MI W RT 24 ON TWP RD 223	BANNER	CDFLT	BANNER,	0
27	WNYN773		BANNER	CDFLT	BANNER,	0
28	WPEE460	1045 S FIFTH AVE	CANTON	CDFLT	BELOIT, PHILIP	0
29	WPEE460		CANTON	CDFLT	BELOIT, PHILIP	0
30	KBD318	FARR SCHOOL RD	VERMON	CDFLT	BLACK GOLD	0
31	KBD318		VERMON	CDFLT	BLACK GOLD	0
32	WQIY355	BNSF LS12 MP133.8 - HBD	Vermont	CDFLT	BNSF Railway Co	0
33	WQIY355		Vermont	CDFLT	BNSF Railway Co	0
34	KJB835	BNSF DEPOT 50 N 4TH AVE	CANTON	CDFLT	BNSF Railway	0
35	KNBU581	BURLINGTON NORTHERN DEPOT	VERMON	CDFLT	BNSF Railway	0
36	WNRG515	RAILROAD MILEPOST 133.8 HBD	VERMON	CDFLT	BNSF Railway	0
37	WPKD403	RAILROAD MILEPOST 180.65	AVON	CDFLT	BNSF Railway	0
38	WPKD403	RAILROAD MILEPOST 182.74	AVON	CDFLT	BNSF Railway	0
39	KNCD534	FIRE HOUSE 4TH ST	SAINT	CDFLT	Buckheart Twp.	0
40	KNCD534		SAINT	CDFLT	Buckheart Twp.	0
41	WNPG710	1/4 MI SW	LIVERPO	CDFLT	BULL JR, EARL	0
42	WNPG710		LIVERPO	CDFLT	BULL JR, EARL	0

43	WQEH968	Ingersoll Airport-26013 N Ingersoll Rd	Canton CDFLT	Canton Park	0
44	WRLB3235	INGERSOLL AIRPORT	CANTON CDFLT	CANTON PARK	0
45	WPAJ631	890 E OAK ST	CANTON CDFLT	CANTON UNIT	0
46	WPAJ631		CANTON CDFLT	CANTON UNIT	0
47	KLL672	101 E SPRUCE ST	CANTON CDFLT	CANTON, CITY	0
48	KLL672	414 N FIRST AVE	CANTON CDFLT	CANTON, CITY	0
49	KLL672		CANTON CDFLT	CANTON, CITY	0
50	KSA920	2 N. MAIN STREET	CANTON CDFLT	CANTON, CITY	0
51	KSA920		CANTON CDFLT	CANTON, CITY	0
52	WNBA806	250 S AVE D	CANTON CDFLT	CANTON, CITY	0
53	WNBA806		CANTON CDFLT	CANTON, CITY	0
54	WNPU223	2 N MAIN STREET	CANTON CDFLT	CANTON, CITY	0
55	WNPU223		CANTON CDFLT	CANTON, CITY	0
56	WNUP803	101 E SPRUCE ST	CANTON CDFLT	CANTON, CITY	0
57	WNUP803		CANTON CDFLT	CANTON, CITY	0
58	WNZL541		CDFLT	CANTON, CITY	0
59	WQJV968	WTP/MASTER - 25495 NORTH LAKE	CANTON CDFLT	CANTON, CITY	0
60	WQJV968	EWST - 49 SOUTH 1ST	CANTON CDFLT	CANTON, CITY	0
61	WQJV968	1000 NORTH 4TH	CANTON CDFLT	CANTON, CITY	0
62	WQJV968	27093 EAST MC KINLEY	CANTON CDFLT	CANTON, CITY	0
63	WQJV968		CANTON CDFLT	CANTON, CITY	0
64	WQJV968	27093 EAST MC KINLEY	CANTON CDFLT	CANTON, CITY	0
65	WQJV968	CR7 DYKE RD/CR7, JUST EAST OF	CANTON CDFLT	CANTON, CITY	0
66	WQJV968		CANTON CDFLT	CANTON, CITY	0
67	WPTB463		CANTON CDFLT	Canton, City of	0
68	KYH675	965 W LOCUST ST	CANTON CDFLT	CANTON,	0

69	KYH675		CANTON CDFLT	CANTON,	0
70	WNSH959	703 E AVE E	LEWIST CDFLT	CAULKINS,	0
71	WNSH959		LEWIST CDFLT	CAULKINS,	0
72	KNKN768	Adjacent Westerly to 21573 E. Illinois H	Farmingt CDFLT	Cellco Partnership	0
73	KNKN768	10132 East IL 116 Highway	London CDFLT	Cellco Partnership	0
74	WMQ581	30830 N. Manley Road	UniontownCDFLT	Cellco Partnership	0
75	WPWF768	4th Avenue and Cypress Road	Canton CDFLT	Cellco Partnership	0
76	WPWH694	4201 Brick House Road	Astoria CDFLT	Cellco Partnership	0
77	WQFJ390	10132 East IL 116 Highway	London CDFLT	Cellco Partnership	0
78	WQFJ391	8489 East IL 9 Hwy	Smithfiel CDFLT	Cellco Partnership	0
79	WNJW275	US 24 1/16 MI E	ASTORIA CDFLT	CLANIN	0
80	WNJW275		ASTORIA CDFLT	CLANIN	0
81	WNRD801	6 MI E OF CENTER ON RT 24 & RT 2	LEWIST CDFLT	COLLINS,	0
82	WNRD801		LEWIST CDFLT	COLLINS,	0
83	WQHJ294	160 E. WALNUT ST.	CANTON CDFLT	COURTYARD	0
84	WQHJ294		CANTON CDFLT	COURTYARD	0
85	WPLF531	32104 N CO 39	FARMIN CDFLT	ELLIOT,	0
86	WPLF531		FARMIN CDFLT	ELLIOT,	0
87	WNNT232	1/8 MI W OF RT 78 AND 1/8 MI S OF	NORRIS CDFLT	ELLIOT,	0
88	WNNT232		NORRIS CDFLT	ELLIOT,	0
89	KBK983	CENTER OF TOWN 100 FT S OF MAIN	ELLISVIL CDFLT	FAIRVIEW FIRE	0
90	KBK983	CHURCH AND CARTER ST	FAIRVIEWCDFLT	FAIRVIEW FIRE	0
91	KBK983	1/2 MI N IL RT 116 ON RT 97 & 150 FT	RAPATE CDFLT	FAIRVIEW FIRE	0
92	KBK983		FAIRVIEWCDFLT	FAIRVIEW FIRE	0
93	WPMF575		CDFLT	FAIRVIEW,	0

94	WPQH620		FARMIN CDFLT	FARMINGTON	0
95	WPQH620	212 N LIGHTFOOT RD	FARMIN CDFLT	FARMINGTON	0
96	KD27141	49 N CONE ST	FARMIN CDFLT	FARMINGTON	0
97	WNLC256	49 N CONE ST	FARMIN CDFLT	FARMINGTON	0
98	KNHM912	33 N EAST ST	FARMIN CDFLT	FARMINGTON,	0
99	KNHM912		FARMIN CDFLT	FARMINGTON,	0
100	KNHM912	322 E. FORT ST.	FARMIN CDFLT	FARMINGTON,	0
101	KNHM912		FARMIN CDFLT	FARMINGTON,	0
102	WPJK617	33 N EAST ST	FARMIN CDFLT	FARMINGTON,	0
103	WPJK617		FARMIN CDFLT	FARMINGTON,	0
104	WPJM666	33 N EAST ST	FARMIN CDFLT	FARMINGTON,	0
105	WPJM666		FARMIN CDFLT	FARMINGTON,	0
106	WPBC461	3.5 MI N & 3/4 MI W	SMITHFI CDFLT	FORD, ROBERT A	0
107	WPBC461		SMITHFI CDFLT	FORD, ROBERT A	0
108	WPZN836		Canton CDFLT	Four Seasons	0
109	WQID552	3986 N CO HWY 2	ASTORIA CDFLT	FRANCE,	0
110	WQID552		ASTORIA CDFLT	FRANCE,	0
111	KQH888	INT OF IL RT 9 & E LYNNE ST	CANTON CDFLT	FREEMAN	0
112	WPCI726	225 W WALNUT ST	CANTON CDFLT	FULTON	0
113	WPEQ500	.2 MI SE INT OF 2750 N & 4TH AVE	CANTON CDFLT	FULTON	
114	WPEQ500	163 N WALNUT ST	ASTORIA CDFLT	FULTON	
115	WPEQ500	225 W WALNUT ST	CANTON CDFLT	FULTON	
116	WPEQ500		CANTON CDFLT	FULTON	
117	WPKD530	225 W WALNUT ST	CANTON CDFLT	FULTON	
118	WPKD530		CANTON CDFLT	FULTON	

119	WPAQ400	268 W WASHINGTON/DISPATCH	LEWIST CDFLT	Fulton County
120	WPAQ400	101 E SPRUCE/DISPATCH	CANTON CDFLT	Fulton County
121	WPAQ400	154 E CHESTNUT/FULTON COUNTY	CANTON CDFLT	Fulton County
122	WPAQ400	MUNICIPAL WATER TOWER	ASTORIA CDFLT	Fulton County
123	WPTR666	2 N. MAIN	CANTON CDFLT	Fulton County
124	WPTR666	ABOUT 1 MI OF MONTEREY, IL	MONTER CDFLT	Fulton County
125	WPTR666	268 W WASHINGTON	LEWIST CDFLT	Fulton County
126	WPUT750	102 E CLINTON	AVON CDFLT	FULTON
127	WPUT750	301 S FULTON ST	LONDON CDFLT	FULTON
128	WPUT750	700 W CARTER ST	FAIRVIEWCDFLT	FULTON
129	WPUV584	101 E AVE B	LEWIST CDFLT	FULTON
130	WPUV584	100 S MAIN	NORRIS CDFLT	FULTON
131	WPUV584	251 S MCARTHUR	BANNER CDFLT	FULTON
132	WPUV584	49 N CONE ST	FARMIN CDFLT	FULTON
133	WPUV584	21375 N BROWN ROAD	CANTON CDFLT	FULTON
134	KFD630	HWY DEPT HEADQUARTERS 430 E	CANTON CDFLT	Fulton County
135	WPHI934	2 KM SW	LEWIST CDFLT	FULTON FS INC
136	WPHI934		LEWIST CDFLT	FULTON FS INC
137	KSA925	268 W WASHINGTON	LEWIST CDFLT	FULTON,
138	KSA925	414 N FIRST	CANTON CDFLT	FULTON,
139	KSA925	119 S ADAMS STREET	LEWIST CDFLT	FULTON,
140	WBM969		CDFLT	GALESBURG
141	WPCE511	113 S MAIN	AVON CDFLT	GALLATIN RIVER
142	WPCE511		AVON CDFLT	GALLATIN RIVER
143	WQJQ223	14056 East US 136	Lewistow CDFLT	GK Crop Service,

144	WQJQ223		Lewistow	CDFLT	GK Crop Service,
145	WNMW955	210 W WALNUT ST	CANTON	CDFLT	GRAHAM
146	WNMW955		CANTON	CDFLT	GRAHAM
147	WNNG814	210 W WALNUT ST	CANTON	CDFLT	GRAHAM
148	WNNG814		CANTON	CDFLT	GRAHAM
149	WPYK347	210 W WALNUT ST	CANTON	CDFLT	GRAHAM
150	WPYK347		CANTON	CDFLT	GRAHAM
151	WQCM886	201 W WALNUT ST	CANTON	CDFLT	GRAHAM
152	WQCM886		CANTON	CDFLT	GRAHAM
153	WQEJ282		Canton	CDFLT	Graham Hospital
154	WQFW477	210 W WALNUT ST	CANTON	CDFLT	GRAHAM
155	WPHJ739			CDFLT	HARDEES FOOD
156	WPHJ739		CANTON	CDFLT	HARDEES FOOD
157	WPJJ830	.8 KM N	ASTORIA	CDFLT	HEITZ, CHRIS
158	WPJJ830	.8 KM N & .8 KM E	VERMON	CDFLT	HEITZ, CHRIS
159	WPJJ830		ASTORIA	CDFLT	HEITZ, CHRIS
160	KFH836		W CENTER ST	CDFLT	FAIRVIEW HELENA
161	KFH836	S EDGE OF CITY LIMITS ON RT 24	LEWIST	CDFLT	HELENA
162	KFH836		FAIRVIEW	CDFLT	HELENA
163	WQAA319	4132 E Seed Corn Rd	Astoria	CDFLT	HELENA
164	WQAA319		Lewistow	CDFLT	HELENA
165	KNIZ716	SW COR FULTON & CLINTON STS	AVON	CDFLT	HENSLEY,
166	KNIZ716		AVON	CDFLT	HENSLEY,
167	KUT302	RT 97 3/4 MI S OF JCT RTS 97 & 116	LONDON	CDFLT	HERBERT
168	KJZ644	1000 W OF AVE F ON S SIDE OF	CANTON	CDFLT	HICKSGAS

169	KNFV515	.7 MI E OF IL RT 41 ON AVONDALE	AVON	CDFLT	HIEL TRUCKING
170	KNFV515		AVON	CDFLT	HIEL TRUCKING
171	KNCJ269	1/2 MI N	FARMIN	CDFLT	HILLSIDE
172	WNMV215	7 MI S	LEWIST	CDFLT	HOWE, DAVID L
173	WNMV215		LEWIST	CDFLT	HOWE, DAVID L
174	WQCX418	South Adams Street	Lewistow	CDFLT	Illinois Bell
175	WNAZ574	PARK OFC ANDERSON LAKE	ASTORIA	CDFLT	ILLINOIS, STATE
176	WNBU795	STATE AID RT 18 3 MI N IL 116	FARMIN	CDFLT	ILLINOIS, STATE
177	WNPZ707	ILLINOIS RIVER CORRECTIONAL	CANTON	CDFLT	ILLINOIS, STATE
178	WNPZ707	ILLINOIS RIVER CORRECTIONAL	CANTON	CDFLT	ILLINOIS, STATE
179	WNPZ707		CANTON	CDFLT	ILLINOIS, STATE
180	WQLC959	1 MILE NORTH OF BLYTON, IL	BLYTON	CDFLT	ILLINOIS, STATE
181	WQLC959		BLYTON	CDFLT	ILLINOIS, STATE
182	WQIH719	728 E LINN STREET	CANTON	CDFLT	INTERNATIONAL
183	WQIH719		CANTON	CDFLT	INTERNATIONAL
184	KNBU865			CDFLT	Keokuk Junction
185	WQJI864	4074 E HEITZ RD	VERMON	CDFLT	KRIDER,
186	WQJI864		VERMON	CDFLT	KRIDER,
187	WNMR883	110 E AVE B	LEWIST	CDFLT	LEWISTOWN
188	WNMR883		LEWIST	CDFLT	LEWISTOWN
189	WPXV210	15501 AVENUE L	LEWIST	CDFLT	LEWISTOWN
190	WPXV210		LEWIST	CDFLT	LEWISTOWN
191	KSZ863	119 S ADAMS ST	LEWIST	CDFLT	LEWISTOWN,
192	KXM333	119 S ADAMS ST	LEWIST	CDFLT	LEWISTOWN,
193	KXM333		LEWIST	CDFLT	LEWISTOWN,

194	KYX823	119 SOUTH ADAMS STREET	LEWIST CDFLT	LEWISTOWN,
195	WPPX856	119 S ADAMS	LEWIST CDFLT	LEWISTOWN,
196	WPPX856		LEWIST CDFLT	LEWISTOWN,
197	WPLG945	700 S MAIN ST	LEWIST CDFLT	MCGAUGHEY,
198	WPLG945	528 E HALSEY	LEWIST CDFLT	MCGAUGHEY,
199	WPLG945		LEWIST CDFLT	MCGAUGHEY,
200	WPLG945		LEWIST CDFLT	MCGAUGHEY,
201	KAD515	930 FIFTH STREET	CANTON CDFLT	METAMORA
202	KWU353	930 S 5TH AVE	CANTON CDFLT	METAMORA
203	WRW284	930 FIFTH ST.	CANTON CDFLT	METAMORA
204	WQHH526	23133 E County Hwy 6	Canton CDFLT	New CIE OPCO
205	WQHH526		Canton CDFLT	New CIE OPCO
206	WQHH526		Canton CDFLT	New CIE OPCO
207	WPVC635	15252 SR 78	LEWIST CDFLT	NEXTEL WIP
208	WPVC635		LEWIST CDFLT	NEXTEL WIP
209	WQKC851	N MELLERT ROAD	CANTON CDFLT	NOVARIANT,
210	WQKC851		CANTON CDFLT	NOVARIANT,
211	WNPM491	500 FT N OF RT 9 .5 MI W	CANTON CDFLT	OSBORNE,
212	WNPM491		CANTON CDFLT	OSBORNE,
213	WPDA356	3/4 MI E RT 78 1/8 MI S CYPRESS ST	CANTON CDFLT	OWENS FARMS
214	WPDA356		CANTON CDFLT	OWENS FARMS
215	WNSC264	5 MI W ON SOUTHSIDE HWY 136	HAVANA CDFLT	PARRISH,
216	WNSC264		HAVANA CDFLT	PARRISH,
217	KST705	RT 24 1 MI W	LITTLE CDFLT	SISTER CREEK
218	KST705	CR 2050 E .4 MI N RT 24 1 MI W	LITTLE CDFLT	SISTER CREEK

219	KST705	CR 2050 E 1 MI N RT 24 1 MI W	LITTLE CDFLT	SISTER CREEK
220	KST705		LITTLE CDFLT	SISTER CREEK
221	WNSC263	8 MI E & 1/2 MI N	ASTORIA CDFLT	SKILES,
222	WNSC263		ASTORIA CDFLT	SKILES,
223	WPYG632	18647 GILCHRIST ROAD	FARMIN CDFLT	SLACK, WILLIAM
224	WPYG632		FARMIN CDFLT	SLACK, WILLIAM
225	WQDN687	930 S 5TH AVE	CANTON CDFLT	SPOON RIVER
226	KSB598	930 S FIFTH AVE	CANTON CDFLT	SPOON RIVER
227	KSB598		CANTON CDFLT	SPOON RIVER
228	WPZT323	3526 N ILLINOIS 97	LONDON CDFLT	SPOON RIVER
229	WPZT323		LONDON CDFLT	SPOON RIVER
230	KSQ879	934 S ILLINOIS ST	LEWIST CDFLT	State of Illinois,
231	WNXY724	1/4 MI N CR 2400N ON CR 200E	MARIETTA	CDFLT STRADER,
232	WNXY724		MARIETTA	CDFLT STRADER,
233	KNNR336	1.7 MI SW OF BANNER	BANNER CDFLT	SUPREME
234	KNNR336		BANNER CDFLT	SUPREME
235	WQBQ952	21495 N Brown Rd	Banner CDFLT	Supreme Radio
236	WQBQ952		Banner CDFLT	Supreme Radio
237	WPLI677	33500 N SWEGLE ROAD	FAIRVIEW	CDFLT TOMPKINS,
238	WPLI677		FAIRVIEW	CDFLT TOMPKINS,
239	WNVI227	2 BLKS S RT 24 1 BLK W	ASTORIA CDFLT	TWO RIVERS FS
240	KZF515	ON RT 78 3 1/2 MI N OF	CANTON CDFLT	United Paving
241	KNKN552	CANTON CELL SITE 2.5 MILES	CANTON CDFLT	USCOC OF
242	KNKN552	LEWISTOWN CELL SITE 1 MILE	LEWIST CDFLT	USCOC OF
243	KNKN552	FARMINGTON CELL SITE 35680 N	FARMIN CDFLT	USCOC OF

244	KNKN552	BANNER CELL SITE: 1.5 MILES NE OF	BANNER CDFLT	USCOC OF
245	KNKN552	LEWISTOWN CELL SITE 1 MILE	LEWIST CDFLT	USCOC OF
246	KNKN552	BRICKHOUSE ROAD	ASTORIA CDFLT	USCOC OF
247	KNKN552	23943 N ILLINOIS 78	CANTON CDFLT	USCOC OF
248	WMS757	2.5 MI NE	CANTON CDFLT	USCOC OF
249	WPNH923	1.5 MI NE OF	BANNER CDFLT	USCOC OF
250	WPNJ815	1 MI N	BLYTON CDFLT	USCOC OF
251	WPOS335	1 MI S	LEWIST CDFLT	USCOC OF
252	WPOS336	BRICKHOUSE ROAD	ASTORIA CDFLT	USCOC OF
253	WPUW365	23943 N ILLINOIS 78	CANTON, CDFLT	USCOC OF
254	WQJK930	30520 N. IL 41 HWY	AVON CDFLT	USCOC OF
255	WQJL401	20803 WEST SOUTHPORT ROAD	ELMWO CDFLT	USCOC OF
256	WNWN532	NW COR OF 6TH & MAIN ST	VERMON CDFLT	VERMONT FIRE
257	WNWN532		VERMON CDFLT	VERMONT FIRE
258	WPTU412	1302 N Main St	Vermont CDFLT	Vermont Township
259	WPTU412		Vermont CDFLT	Vermont Township
260	WNJM338	RT 9 4 MI W	FIATT CDFLT	VIGNA, JOHN
261	WNJM338		FIATT CDFLT	VIGNA, JOHN
262	KAG932	3 MI E FAIRVIEW ON CR 17	CANTON CDFLT	VOHLAND
263	KAG932	29060 N BUBAN ROAD	CANTON CDFLT	VOHLAND
264	KAG932	1.5 MI E 2.5 MI S OF MIDDLEGROVE	FARMIN CDFLT	VOHLAND
265	KAG932		CANTON CDFLT	VOHLAND
266	KAG932		CANTON CDFLT	VOHLAND
267	WNYZ245	SW COR OF FULTON & CLINTON STS	AVON CDFLT	WALTER, JERRY
268	WNYZ245		AVON CDFLT	WALTER, JERRY

269	WNLQ336	RT 116W 1 MI W	FARMIN	CDFLT	WALTERS, LARRY	
270	WNLQ336		FARMIN	CDFLT	WALTERS, LARRY	
271	KTG990		CANTON	CDFLT	WPW	
272	KXU636	3 MI SW	VERMON	CDFLT	YOUNG,	
273	E3993		LEWIST	CDFLT	Comcast of	
274	WNCX227	CORNER OF 1ST ST & JAMES	TABLE	CDFLT	CASSIDY AG	0
275	WNCX227		TABLE	CDFLT	CASSIDY AG	0

## Dams Report

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
1	VANWINKLE LAKE DAM	TRIB BIG CREEK	CANTON	Mr. Dan Monn	R	20	
2	KEYSTONE ANGLERS CLUB	TRIB COAL CREEK	ELLISVILLE	Meadowlark Farms	R	47	
3	WOLF POND DAM	BIG CREEK-OFFSTREAM	CANTON	Consolidated Coal	O	30	
4	FRESHWATER LAKE DAM	TRIB SOUTH BRANCH	SUMMUM-	Meadowlark Farms,	O	17	
5	LAKE AVON COUNTRY CLUB	TRIB GALLETT CREEK	AVON	City of Avon	RS	23	
6	WEE MA TUK LAKE DAM	PUT CREEK	SEVILLE	Wee-Ma-Tuk Hill	R	38	
7	CANTON CITY LAKE DAM	WEST BRANCH COPPERAS	BANNER	City of Canton	SR	57	
8	CARTHAGE LAKE 1 DAM	TRIB LONG CREEK	CARTHAGE-	City of Carthage	SR	38	
9	WOODS LAKE DAM	PUT CREEK-OFFSTREAM	SEVILLE	Wee-Ma-Tuk Hills	R	21	
10	TRUAX LAKE DAM	TRIB PUT CREEK	WAYNE CITY	Wee-Ma-Tuk Hills	R	20	
11	MSDGC DAM 3	TRIB EVELEN CREEK	BRYANT-	Metropolitan Water	C	19	
12	MSDGC DAM 3	TRIB SLUG RUN	CUBA-	Metropolitan Water	R	15	
13	MSDGC DAM 9	SLUG RUN	DEPLER	Metropolitan Water	C	26	

<b>ID</b>	<b>Name</b>	<b>River</b>	<b>City</b>	<b>Owner</b>	<b>Purpose</b>	<b>Height (ft)</b>	<b>ReplaCost</b>
14	MSDGC DAM 5	TRIB BIG CREEK-	DEPLER	Metropolitan Water	R	17	
15	MSDGC DAM 6	TRIB BIG CREEK-	DEPLER	Metropolitan Water	R	35	
16	MSDGC DAM 8	SLUG RUN	DEPLER	Metropolitan Water	C	20	
17	IPAVA SETTling BASIN DAM	FRANCIS CREEK	CAMP ELLIS-	Meadowlark Farms	O	24	
18	MSDGC SLUDGE POND 1-3A	EVELEN BRANCH-	BRYANT-	Metropolitan Water	O	39	
19	MSDGC DAM 5	TRIB BIG SISTER CREEK	LIVERPOOL-	Metropolitan Water	C	22	
20	MSDGC DAM 7	TRIB BIG CREEK	DEPLER	Metropolitan Water	O	35	
21	DUCK CREEK WASTE AREA II	DUCK CREEK	LIVERPOOL	Central Illinois Light	O	50	
22	SULLIVAN LAKE DAM	TRIB GAINES BRANCH	RAY	John Taraska	R	34	
23	SLUG RUN LAKE DAM	TRIB SLUG RUN CREEK	DEPLER	Metropolitan Water	R	20	
24	ROAD FILL LAKE DAM	TRIB SLUG RUN CREEK	DEPLER	Metropolitan Water	R	37	
25	DIVERSION DRAINAGE LAKE	TRIB OTTER CREEK	VERMONT	Meadowlark Farms	R	32	
26	EVELEN LAKE DAM	EVELEN BRANCH, BIG	BRYANT	Metropolitan Water	RO	48	
27	LITTLE SISTER LAKE DAM	LITTLE SISTER CREEK	MAPLESWILL	Metropolitan Water	R	38	
28	MIDLAND/RAPATEE	TRIB LITTLE CREEK	MIDDLEGRO	Midland Coal	O	30	
29	TRAER LAKE DAM	TRIB PUT CREEK	SEVILLE	Wee-Ma-Tuk Hills	R	20	
30	LONG LAKE DAM	PUT CREEK-OFFSTREAM	SEVILLE	Wee-Ma-Tuk Hills	R	20	
31	LAKE MARIE DAM	PUT CREEK-OFFSTREAM	SEVILLE	Wee-Ma-Tuk Hills	R	27	
32	WEE-MA-TUK-LAKE-SOUTH	TRIB PUT CREEK	SEVILLE	Wee-Ma-Tuk Hills	R	24	
33	NORRIS SLURRY POND DAM	OFFSTREAM BIG CREEK	NORRIS	Coal Inc.	O	50	
34	GRIEVES DAM	TRIB ILLINOIS RIVER	NONE	Lowell Grieves	R	28	
35	BUCKHEART MINE NO. 17		CANTON	FREEMAN UNITED	T	20	
36	BUCKHEART MINE NO. 17		CANTON	FREEMAN UNITED	S	10	
37	LAKE ROBERTS DAM	CEDAR CREEK	LONDON	BOY SCOUTS OF	O	30	

<b>ID</b>	<b>Name</b>	<b>River</b>	<b>City</b>	<b>Owner</b>	<b>Purpose</b>	<b>Height (ft)</b>	<b>ReplaCost</b>
38	CBS GUN CLUB LAKE DAM	TURKEY CREEK	BLYTON-	C. F. CUMMINGS	O	40	
39	SWEENEY'S POND DAM	TRIB-SHOAL CREEK	SEVILLE	D.K. SWEENEY	O	34	
40	DARST POND DAM	TRIB-SHAW CREEK-SPOON	MARIETTA-	CLYDE DARST	FO	33	
41	HELLER POND DAM	TRIB-OTTER CREEK	VERMONT	GEORGE HELLER	FO	21	
42	LAKE WILDWOOD HAVEN	SOUTH FORK SHAW CREEK	MARIETA	ALBERT HAVENS	RF	43	
43	MAAS DAM	TRIB LITTLE COAL CREEK	KELLISVILLE	Paul Maas	R	60	

## Electric Power Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Function</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	CENTRAL ILLINOIS	17751 NORTH CILCO ROAD	CANTON	EDFLT				122100

## EOC Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>YearBuilt</b>	<b>ShelterCap</b>	<b>Stories</b>	<b>ReplaCost</b>
1	Farmington ESDA	33 N East St	Farmington	EFEO				\$1,110
2	Cuba City ESDA	405 E Jefferson	Cuba	EFEO				\$1,110
3	Canton Emergency Svc	101 E. Spruce St.	Canton	EFEO	1981	N/A	1	\$1,110
4	Lewistown ESDA	119 S Adams St	Lewistown	EFEO				\$1,110

# FireStation Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	Fairview FPD	445 Church ST	Fairview	EFFS			\$500
2	London Mills Fire Protection	301 S Second ST	London Mills	EFFS			
4	Smithfield Fire Protection	116 N Main ST	Smithfield	EFFS			
5	Table Grove Fire Protection	601 S Broadway	Table Grove	EFFS			
6	Buckheart TWP Fire	500 N Grand AVE	Saint David	EFFS			
7	Lewistown Fire Protection	110 E Avenue B	Lewistown	EFFS			
8	Vermont Fire Protection	208 S Main ST	Vermont	EFFS			
9	Avon FPD	102 E Clinton ST	Avon	EFFS			
10	Cuba FPD	411 E Jefferson	Cuba	EFFS			
11	Canton Fire Department	101 E Spruce ST	Canton	EFFS	1	1979	
12	Astoria Fire Department	101 E State ST	Astoria	EFFS			
13	Farmington FPD	49 N Cove ST	Farmington	EFFS			
15	Ipava Fire Protection District	290 W Main	Ipava	EFFS			
17	Ellisville Fire Station	105 E Coal St	Ellisville	EFFS			
18	Marietta Fire Station	115 W Coal St	Marietta	EFFS			
19	Buckheart Fire Department	513 N Center St	Dunfermline	EFFS			
20	Buckheart Fire Department	180 W Vernon St	Liverpool	EFFS			
21	Cuba Fire Department		Fiatt	EFFS			
22	Copperas Creek Fire Dept	100 S Main St	Norris	EFFS			
23	Copperas Creek Fire Dept	251 S Mcarthur St	Banner	EFFS			

## Hazardous Materials

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>EPAID</b>	<b>ChemicalName</b>
1	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	BARIUM
2	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	CHROMIUM
3	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	MANGANESE
4	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	NICKEL
5	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	ZINC COMPOUNDS
6	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	"HYDROCHLORIC
7	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	HYDROGEN
8	AES DUCK CREEK	17751 N. CILCO RD.	CANTON	HDFLT	ILD984796300	"SULFURIC ACID

## Medical Care Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Function</b>	<b>Beds</b>	<b>Stories</b>	<b>ReplaCost</b>
1	Mark Baylor	171 E VERNON ST, 61531			Clinic			
2	Graham Medical Group	141 E VERNON ST, 61531	Canton		Clinic			
4	Methodist Clinic	2076 N MAIN ST, 61520			Clinic			
5	Methodist Clinic	158 E FULTON ST, 61531			Clinic			
6	Table Grove	130 N BROADWAY ST, 61482			Clinic			
7	Community Medical Clinic	135 W BROADWAY ST, 61501			Clinic			
8	Fulton County Health	700 E OAK ST, 61520			Clinic			
9	Graham Hospital	210 W WALNUT ST, 61520			Hospital			

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Function</b>	<b>Beds</b>	<b>Stories</b>	<b>ReplaCost</b>
10	Astoria Gardens	1008 E. Broadway	Astoria	EFHM	NursngHome	69		
11	Emerald Estates	1577 E. Myrtle St.	Canton	EFHS	NursngHome	16		
12	Heartland Healthcare	2081 N. Main St.	Canton	EFHM	NursngHome	98		
13	Renaissance Care Center	1675 E. Ash St.	Canton	EFHL	NursngHome	194		
14	Sunset Manor Nursing	129 South 1st Ave	Canton	EFHM	NursngHome	107		
15	The Clayberg	East Monroe St	Cuba	EFHS	NursngHome	49		
16	Farmington Country	701 S. Main St.	Farmington	EFHM	NursngHome	92		
17	Broadway Arms	1003 N. Broadway	Lewistown	EFHS	NursngHome	12		
18	Prairie View Care Center	175 E. Sycamore Drive	Lewistown	EFHM	NursngHome	99		
19	Health & Wellness Center	1037 S Fifth St	Canton		Clinic			

## Police Station Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Stories</b>	<b>ShelterCap</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	Police Dept	119 S Adams St	Lewistown	EFPS				1554
2	Canton Police Dept	2 N Main St	Canton	EFPS				1554
3	Fairview Police Dept	245 W Wilson St	Fairview	EFPS				1554
4	Fulton County Sheriff	268 W Washington Ave	Lewistown	EFPS				1554
5	Farmington Police Dept	33 N East St	Farmington	EFPS				1554
6	Cuba Police	403 E Jefferson St	Cuba	EFPS				1554

## Port Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Function</b>	<b>Berths</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	Jack Tanner Towing Co.,		Havana	PDFL			1997	

## Potable Water Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Function</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	AVON WTP	502 E. Wood	AVON					36963
2	BRYANT WTP	MAIN STREET	BRYANT					36963
3	CANTON WTP	25495 N Lakeshore Drive	CANTON					36963

## School Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Students</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	FARMINGTON CENTRAL JR	300 N LIGHTFOOT RD	FARMINGTON	EFS1	320			4719.1703
2	FARMINGTON CENTRAL	108 N LIGHTFOOT RD	FARMINGTON	EFS1	684			12880.3855
4	AVON MIDDLE SCHOOL	320 E WOODS	AVON	EFS1	58			855.3496
5	AVON SR HIGH SCHOOL	320 E WOODS ST	AVON	EFS1	83			1428.0406
6	AVON GRADE SCHOOL	320 E WOODS	AVON	EFS1	132			1622.2148
7	CANTON HIGH SCHOOL	1001 N MAIN ST	CANTON	EFS1	773			15638.3965
8	LINCOLN ELEMENTARY	20 LINCOLN RD	CANTON	EFS1	242			2994.2153
9	WESTVIEW ELEMENTARY	700 W OLD VINE ST	CANTON	EFS1	445			7534.6962
10	EASTVIEW ELEMENTARY	1490 E MYRTLE ST	CANTON	EFS1	434			7288.6603
11	INGERSOLL MIDDLE	1605 E ASH ST	CANTON	EFS1	791			16470.3961
12	ASTORIA HIGH SCHOOL	402 N JEFFERSON	ASTORIA	EFS1	104			1789.3521
13	CUBA MIDDLE SCHOOL	20325 N ILL HWY 97	CUBA	EFS1	83			1224.0348
14	CUBA SR HIGH SCHOOL	20325 N ILL HWY 97	CUBA	EFS1	159			2735.6441

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Class</b>	<b>Students</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
15	CUBA ELEM SCHOOL	PO BOX 80	CUBA	EFS1	297			4224.3948
16	SPOON RIVER ACADEMY	23235 N COUNTY 22	CANTON	EFS1	20			344.1062
17	FULTON REGIONAL SAFE	749 E LOCUST ST	CANTON	EFS1	17			292.4902
18	CENTRAL ELEM SCHOOL	15501 E AVE L	LEWISTOWN	EFS1	309			4556.9489
19	LEWISTOWN ELEMENTARY	15501 E AVE L	LEWISTOWN	EFS1	241			2971.8484
20	LEWISTOWN HIGH	15205 N STATE 100HWY	LEWISTOWN	EFS1	227			3905.605
21	NEW HORIZONS	315 S ILLINOIS	LEWISTOWN	EFS1	30			516.1593
22	ASTORIA ELEM SCHOOL	402 N JEFFERSON	ASTORIA	EFS1	151			1855.7154
23	ASTORIA JUNIOR HIGH	402 N JEFFERSON	ASTORIA	EFS1	89			1312.5193
24	SPOON RIVER VALLEY JR	35265 N IL 97	LONDON MILLS	EFS1	62			914.3393
25	SPOON RIVER VALLEY SR	35265 N IL 97	LONDON MILLS	EFS1	136			2339.922
26	SPOON RIVER VALLEY	35265 N IL 97	LONDON MILLS	EFS1	253			3240.2512
27	V I T SR HIGH SCHOOL	1500 US 136 E	TABLE GROVE	EFS1	137			2357.1273
28	V I T JR HIGH SCHOOL	1500 US 136 E	TABLE GROVE	EFS1	67			988.0763
29	V I T ELEMENTARY SCHOOL	1502 US 136 E	TABLE GROVE	EFS1	221			2715.9808
30	CALVARY BAPTIST	20 N AVENUE I	CANTON	EFS1	40			688.2123

## WasteWater Facilities Report

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Function</b>	<b>Class</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
1	ASTORIA STP	SOUTH CHESTNUT STREET	ASTORIA		WDF			73926
2	BANNER STP	RURAL ROUTE #3	CANTON		WDF			73926

<b>ID</b>	<b>Name</b>	<b>Address</b>	<b>City</b>	<b>Function</b>	<b>Class</b>	<b>Stories</b>	<b>YearBuilt</b>	<b>ReplaCost</b>
3	AVON STP	EAST WOODS STREET	AVON		WDF			73926
4	CANTON WEST	350 WEST HICKORY STREET	CANTON		WDF			73926
5	CUBA WWTP	20139 IL Hwy 97	CUBA		WDF			73926
6	DUNFERMLINE/ST.	5TH STREET	SAINT DAVID		WDF			73926
7	FAIRVIEW STP	VILLAGE HALL	FAIRVIEW		WDF			73926
8	FARMINGTON SD STP	FAIRVIEW ROAD	FARMINGTON		WDF			73926
9	IPAVAL STP	VILLAGE HALL	IPAVAL		WDF			73926
10	LEWISTOWN STP	WEST EUCLID	LEWISTOWN		WDF			73926
11	LONDON MILLS STP	ROUTE 116	LONDON MILLS		WDF			73926
12	MARIETTA STP	P.O. BOX 24	MARIETTA		WDF			73926
13	SMITHFIELD STP	P.O. BOX 25	SMITHFIELD		WDF			73926
14	TABLE GROVE STP	VILLAGE HALL	TABLE GROVE		WDF			73926
15	VERMONT SD STP	RURAL ROUTE	VERMONT		WDF			73926

## **Appendix F. Critical Facilities Map**

-See Attached Large-Format Map