Hazard Mitigation Plan

Perry County, Illinois

Adoption Date: -- _____ --

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Section 1 - Public Planning Process

1.1 Narrative Description

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 a requirement 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.

The Greater Egypt Regional Planning Commission was established in 1961 to "provide a plan for the general purpose of guiding and accomplishing a coordinated, adjusted, and harmonious development of the Franklin, Jackson, Perry, and Williamson County region, and of public improvement and utilities therein for the purpose of best promoting health, safety, morals, order, convenience, prosperity, efficiency and economy in the process of development and the general welfare of said region." In 1967, Jefferson County was added to the Greater Egypt Region. The Commission was re-established as Greater Egypt Regional Planning & Development Commission (GERPDC). The Commission, Perry County Emergency Management Agency, SIU-C Geology Department, The Polis Center of IUPUI, and Perry County have joined efforts to develop this mitigation plan realizing that the recognition of and the protection from hazards that impact the county and its residents contribute to future community and economic development.

In recognition of the importance of planning in mitigation activities, FEMA has created HAZUS-MH (**Haz**ards **US**A **M**ulti-**H**azard) a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict the 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. The Illinois Emergency Management Agency (IEMA) has determined that HAZUS-MH should play a critical role in the risk assessments in Illinois. Southern Illinois University at Carbondale (SIUC) and The Polis Center at Indiana University Purdue University Indianapolis (IUPUI) are assisting Perry County planning staff with performing the hazard risk assessment.

1.2 Planning Team Information

The Perry County Multi-Hazard Mitigation Planning Team is headed by Perry County Emergency Management Agency. William Place is the primary point of contact. Members of the planning team including county officials, individuals from local jurisdictions within the county, and private sector representatives. Table 1-1 below identifies the planning team individuals and the organizations they represent.

Table 1-1: Multi-Hazard Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Brent Kreid	Superintendent	Pinckneyville Community High School District #101	Pinckneyville
Dan Uhles	Village Trustee	Village of St. Johns	St. Johns
David Searby	Director	Du Quoin ESDA	Du Quoin
Doug Bishop	County Engineer	Perry County Hwy. Dept.	Perry County
Eric Pflanz	Citizen	City of Du Quoin	Du Quoin
Gary Kelly	Superintendent	Du Quoin CUSD #300	Du Quoin
James Gielow	Chief	Pinckneyville Fire Dept.	Pinckneyville
Jeff Ashauer	Executive Director	Perry County Office of Planning & Development	Perry County
Jim Epplin	County Board	Perry County	Perry County
Jodi Schoen	Administrator	Perry County Health Dept.	Perry County
Joe Riggio	Captain	Du Quoin Fire Dept.	Du Quoin
John Griffin	Chief	Pinckneyville City Police Dept.	Pinckneyville
Keith Kellerman	Sheriff	Perry County Sheriff's Office	Perry County
Melvin Carrother	Village Clerk	Village of Cutler	Cutler
Michael A Ward	Chief	Du Quoin Police	Du Quoin
Mike Millikin	Utility Superintendent	City of Pinckneyville	Pinckneyville
Randy DeMent	Director	Perry County 911	Perry County
Raymond Clark	EOC Officer	Du Quoin ESDA	Du Quoin
Robert L. Spencer	District Conservationist	USDA-NRCS	Federal/Pinckneyville
Robin L. Edwards	Former County Assessor	Perry County Assessor's Office	Perry County
Sherry Wertz	Assistant Chief Nursing Officer	Marshall Browning Hospital	Perry County
Stuart Swallers	Police Officer	Du Quoin Police Dept.	Du Quoin
Tim O'Leary	Superintendent	Pinckneyville School District #50	Pinckneyville
William Place	Director	Perry County EMA	Perry County

The Disaster Mitigation Act (DMA) planning regulations and guidance stress that planning team members must be active participants. The Perry County MHMP committee members were actively involved on the following components:

- Attending the MHMP meetings
- Providing available Geographic Information System (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

An MHMP introductory meeting was held at SIU-C on March 19, 2008. Representatives of Franklin, Jackson, Jefferson, Perry, and Williamson Counties attended the meeting. John Buechler, MHMP Project Manager from The Polis Center, and Nicholas Pinter, SIU-C Geology Department, explained the motive behind the MHMP program and answered questions from the participants. Nicholas Pinter, Andy Flor, and Harvey Henson from SIUC provided an introduction to hazards, and John Buechler and Dave Coats from The Polis Center provided an overview of HAZUS-MH. John Buechler described the timeline and the procedures to take place throughout the planning project. Shortly after the meeting, in response to many concerns of the security and limited use of the counties' GIS data, a Memorandum of Understanding (MOU) was created and signed by each county chairman.

The county board chairmen met with representatives from GERPDC, SIU-C, and The Polis Center on March 19, 2008, to discuss the planning process and prospective planning team members. The county Multi-Hazard Mitigation Planning Team met on August 19, 2008, October 10, 2008, December 16, 2008, January 22, 2009, and April 9, 2009. These meetings were held at the Du Quoin City Hall located in Du Quoin, Illinois. Each meeting was approximately two hours in length. The meeting agendas, minutes, and attendance sheets 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.

1.3 Public Involvement in Planning Process

The planning process commenced on January 29, 2008, when Southern Illinois University-Carbondale held a news conference to advise the general public that FEMA had approved funding of proposed planning activities for natural disaster preparedness. It was explained that the university would collaborate with members of The Polis Center as well as the five regional planning commissions. The news conference was attended by representatives of the local papers, radio, and television.

Perry County conducted presentations for the public to give an overview of the planning process, inform them of the benefits of completing the plan, and discussed natural hazards affecting Perry County. A public meeting was held on December 16, 2008 at the Du Quion City Hall. Appendix A contains the agenda and minutes from that public meeting. Appendix B contains articles published by the local newspaper throughout the public input process.

1.4 Neighboring Community Involvement

The Perry County planning team invited participation from various representatives of neighboring counties, local city, and town governments. The initial planning meeting at SIU-C on March 19, 2008 included representatives from the adjacent GERPDC counties of Franklin, Jackson, Jefferson, Perry, and Williamson. In the meeting, the county board chairmen and their EMA directors discussed creating county planning teams, scheduling meetings throughout the planning process, and ways to ensure public involvement in the plan. The county board chairmen also agreed to allow university research staff to have access to county GIS programs and data from the supervisor of the assessment.

Perry County is bounded by Franklin, Jackson, and Jefferson Counties. Jackson County, located to the south of Perry County, has working relationships and cooperation with Perry County through regional partnerships. The regional planning Commission staff provides monthly status of each county's mitigation planning program to its commission, which is comprised of county and municipal representatives. Details of how neighboring stakeholders were involved are summarized in Table 1-2.

Table 1-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Randall Crocker	Franklin	County	Briefed on the plan and provided comments
John Evans	Jackson	County	Briefed on the plan and provided comments
Derek Misener	Jackson	County EMA	Briefed on the plan and provided comments
Ted Buck	Jefferson	County	Briefed on the plan and provided comments
Dennis Litton	Jefferson	County EMA	Briefed on the plan and provided comments
Brent Gentry	Williamson	County	Briefed on the plan and provided comments
Alan Gower	Williamson	County EMA	Briefed on the plan and provided comments
Chris Pulley	Illinois	IEMA	Briefed on the plan and provided comments
Rick Shryock	Illinois	IEMA	Briefed on the plan and provided comments

1.5 Review of Technical and Fiscal Resources

The MHMP 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 1-3.

Table 1-3: Key Agency Resources Provided

Agency Name	Resources Provided
U.S. Census (American Fact Finder)	County Profile Information such as Population and Physical Characteristics
Department of Commerce and Economic Opportunity	Community Profiles
Illinois Department of Employment Security	Industrial Employment by Sector
National Climatic Data Center	Climate Data
USDA/US Forest Service	Physical Characteristics
Illinois Emergency Management Agency	2007 Illinois Natural Hazard Mitigation Plan
Greater Egypt Regional Planning & Development Commission	The Comprehensive Plan for the Greater Egypt Region; A Comprehensive Community Plan Pinckneyville, Illinois; The Comprehensive Plan for Du Quoin, Illinois; The Comprehensive Plan for St. Johns, Illinois; The Comprehensive Plan for Willisville, and Illinois County Estimates: Corn, Soybeans, and Wheat
Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps; Big Muddy River Basin Interim Water Quality Management Plan
United States Geological Survey	Physiographic/Hill Shade Map
Illinois State, Illinois Regional Archives Depository	County Profile
Illinois State Geological Survey	Coal Mining Maps; Karst Areas; Geologic Data; Soils and Liquefaction Maps; Digital copy of FRIM map
Center for Earthquake Research, University of Memphis	Earthquake Data
Perry County Assessor's Office	Parcel Data, and Assessed Values of Property
Perry County E911	GIS Data

1.6 Review of Existing Plans

Perry County and its associated local communities utilize a variety of planning documents to direct community development. These documents include land use plans, master plans, emergency response plans, municipal ordinances, and building codes. The MHMP planning process incorporated the existing natural hazard mitigation elements from these previous planning efforts. Table 1-4 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 1-4: Planning Documents Used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
State of Illinois Environmental Protection Agency	1973	Big Muddy River Basin Interim Water Quality Management Plan (Draft)	This study examines the Big Muddy River Basin. The analysis covers a description of the basin, demographics, economics, water supplies, water use, water quality, pollution sources, sewerage facilities, permits, surveillance, enforcement, operator certification, and environmental impact.	Jurisdiction Information and Topography
National Agricultural Statistics Service	2006 – 2007	Illinois County Estimates: Corn, Soybeans, and Wheat	This release contains official estimates of acreage, yield and production of corn, soybeans and wheat for counties in Illinois.	Land Use and Development Trends
Greater Egypt Regional Planning & Development Commission	1964	The Comprehensive Plan for the Greater Egypt Region	It offers guidelines for counties, cities and villages in their quest for improved social and economical opportunities for their citizens.	Topography and Land Use and Development Trends
Illinois Emergency Management Agency	2007	Illinois Natural Hazard Mitigation Plan	The Illinois Natural Hazard Mitigation Plan (INHMP) establishes a process for identifying and mitigating the effects of natural hazards in the State of Illinois as required under the Disaster Mitigation Act of 2000.	Topography
Greater Egypt Regional Planning & Development Commission	1967	A Comprehensive Community Plan Pinckneyville, Illinois	This study provides information on the population, economic base, land use and housing, public facilities, central business district and transportation and circulation aspects of the city.	Zoning Ordinance and Land Use Plan
Greater Egypt Regional Planning & Development Commission	1964	The Comprehensive Plan for Du Quoin, Illinois	This study provides information on the population, economic base, land use and housing, public facilities, central business district and transportation and circulation aspects of the city.	Zoning Ordinance and Land Use Plan
Greater Egypt Regional Planning & Development Commission	1964	The Comprehensive Plan for St. Johns, Illinois	This study provides information on the population, economic base, land use and housing, public facilities, central business district and transportation and circulation aspects of the city.	Zoning Ordinance and Land Use Plan

Author(s)	Year	Title	Description	Where Used
Greater Egypt Regional Planning & Development Commission	1966	The Comprehensive Plan for Willisville, and Illinois County	This study provides information on the population, economic base, land use and housing, public facilities, central business district and transportation and circulation aspects of the city.	Zoning Ordinance and Land Use Plan
Perry County Economic Development	2008	The Comprehensive Plan for the Year 2020 for Du Quoin	This study provides information on the population, economic base, and land use of the city.	Zoning Ordinance and Land Use Plan

Section 2 - Jurisdiction Participation Information

The jurisdictions included in this multi-jurisdictional plan are listed in Table 2-1.

Table 2-1: Jurisdictions Located in the Planning Area

Jurisdiction Name
Perry County
Village of Cutler
City of Du Quoin
City of Pinckneyville
Village of St. Johns
Village of Tamaroa
Village of Willisville

2.1 Adoption by local governing body

The draft plan was made available on April 9, 2009 to the planning team and other agencies such as county and municipal officials for review. Comments were then accepted. The Perry County Hazard Mitigation Planning team presented and recommended the plan to *<the officials responsible for adopting>*, who adopted the Perry County Hazard Mitigation Plan on *<date adopted>*. Resolution adoptions are included in Appendix C of this plan.

2.2 Jurisdiction Participation

It is required that each jurisdiction participate in the planning process. Table 2-2 lists each jurisdiction and how each participated in the construction of this plan.

Table 2-2: Jurisdiction Participation

Jurisdiction Name	Participating Member	Participation Description
Perry County	Jim Epplin, Perry County Board	Member, MHMP planning committee
Perry County/Tamaroa	William Place, Director of Perry County EMA	Member, MHMP planning committee
Perry County	Ted Harsha, Deputy of Perry County EMA	Briefed on the plan and provided comments
Perry County	Keith Kellerman, Perry County Sheriff's Dept.	Member, MHMP planning committee
Perry County	Robin L. Edwards, Former Supervisor of Assessments	Member, MHMP planning committee
Perry County	Randy DeMent, Perry County 911	Member, MHMP planning committee
Perry County	Jeff Ashauer, Executive Director of Perry County Office of Planning and Development	Member, MHMP planning committee
Perry County	Doug Bishop, Perry County Engineer	Member, MHMP planning committee
Perry County	Rich Dial, Manager - Ameren	Member, MHMP planning committee
Pinckneyville	John Griffin, Chief of Pinckneyville Police Dept.	Member, MHMP planning committee

Jurisdiction Name	Participating Member	Participation Description
Du Quoin	Gary Kelly, Superintendent of Du Quoin CUSD #300	Member, MHMP planning committee
Du Quoin	David Searby, Du Quoin ESDA	Member, MHMP planning committee
Du Quoin	Joe Riggio, Du Quoin Fire Dept.	Member, MHMP planning committee
St. Johns	Dan Uhles, Trustee of the Village of St. Johns	Member, MHMP planning committee
Cutler	Melvin Carrothers, Village Clerk of Cutler	Member, MHMP planning committee

At each planning meeting, Greater Egypt Regional Planning & Development Commission staff explained the importance of the multi-hazard mitigation plan for the county and emphasized the need for participation from all communities. Despite the best efforts of the Greater Egypt Regional Planning & Development Commission to solicit participation from all incorporated communities in Perry County, the village of Willisville did not participate in the formulation of the Perry County plan.

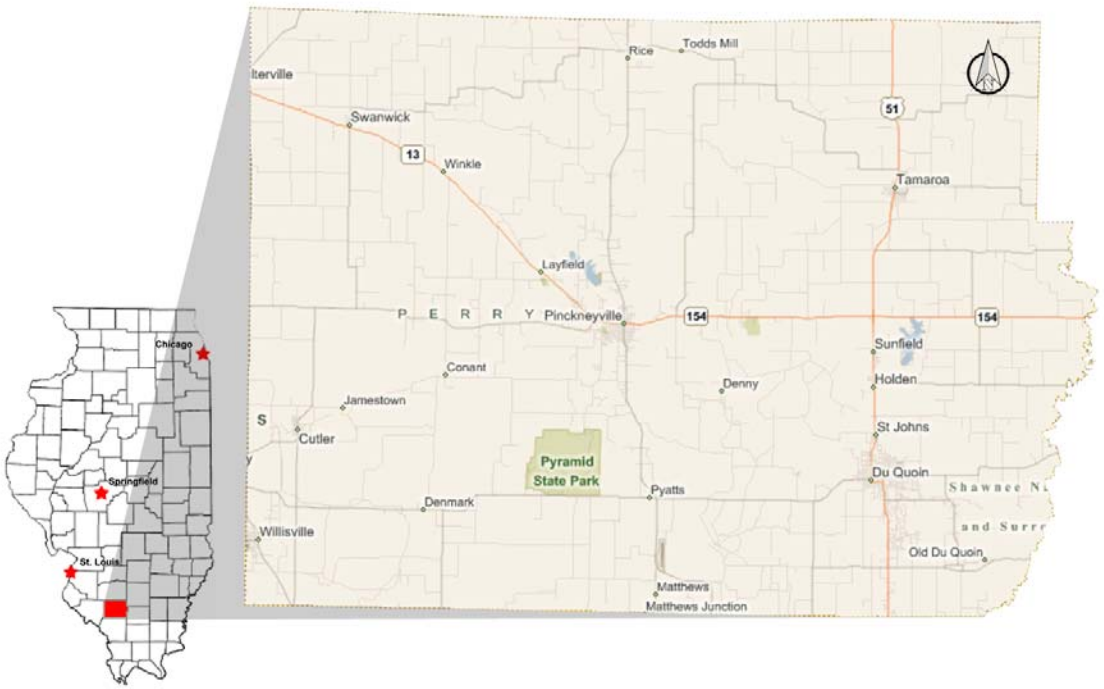
All members of the MHMP planning committee were actively involved in attending the MHMP meetings, providing available Geographic Information System (GIS) data and historical hazard information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and coordinating the county's formal adoption of the plan. Each meeting culminated with an open forum to invite questions and input from the team members. Appendix A provides further description of the meetings, including dates.

Section 3 - Jurisdiction Information

Perry County was organized and claimed its political boundaries from the division of Randolph and Jackson Counties in 1827. The county was named after Commodore Oliver Hazard Perry of the United States Navy, who won distinction as Commander of the fleet in the battle of Lake Erie. In 1828 the location of the county seat was established in Pinckneyville.

Perry County is located in southwest Illinois. It is bounded on the north by Washington County, on the south by Jackson County, on the west by Randolph County, and on the east by Jefferson and Franklin Counties. Its relation to major urban areas is as follows: 73 miles southeast of St. Louis, Missouri; 143 miles south of Springfield, Illinois; 316 miles south-southwest of Chicago, Illinois. Figure 3-1 shows the location of Perry County.

Figure 3-1: Map of Perry County



Perry County's population has remained relatively stable over the past three decades. The major sources of economic activity include manufacturing, coal mining, education, health, social services, public administration, retail trade, arts, entertainment, recreation, accommodation, and food services. A few of the top private employers in the county include Cooper B-Line, Contempri Industries Inc., and General Cable. New development in Perry County tends to focus on Du Quoin and Pinckneyville. A new route 127 bypass is in planning and development stages to relieve congestion around the county courthouse and increase traffic flow around Pinckneyville.

Perry County offers amenities such as recreation, shopping centers, education, restaurants, and entertainment. A Rend Lake Community College off-campus site is located in Pinckneyville. Pyramid State Park is the largest state park in Illinois located just south of Pinckneyville. The State Fair Grounds in Du Quoin hosts fairs, concerts, racing, and many other events. Other communities within the county offer similar amenities, such as restaurants, entertainment, and shopping on a rural scale.

Sources:

State of Illinois Environmental Protection Agency, Big Muddy River Basin Interim Water Quality Management Plan, 1973

Adams, James N. (compiler), Keller, William E., ed., Illinois Place Names, Springfield: Illinois State Historical Society, 1989, pp. 609,

State of Illinois, Origin and Evolution of Illinois Counties, 1982

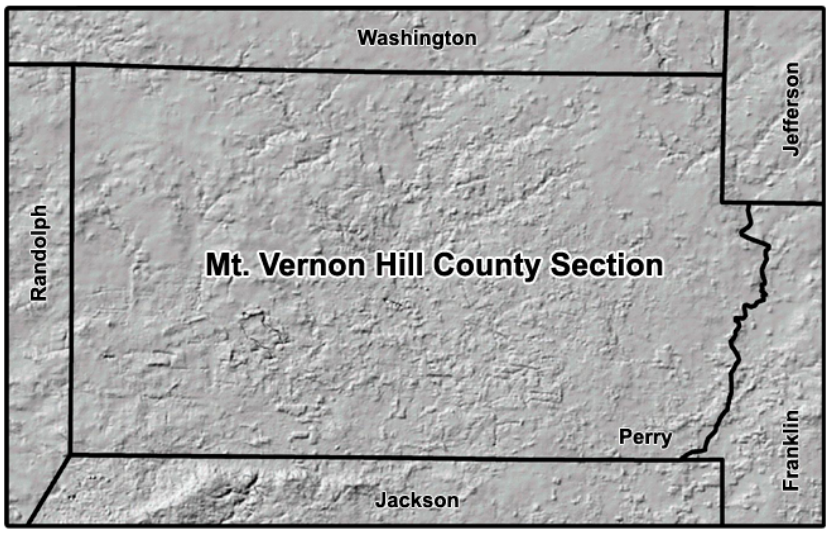
Union Atlas Co. Warner & Beers, Proprietors, Atlas of the State of Illinois, to which are added Various General Maps: History Statistics and Illustrations. 1876

3.1 Physical Setting (Topography)

Perry County is located in the Mount Vernon Hill Country physiographic sub-division of the Till Plains. The Mount Vernon Hill Country is characterized by low rolling hills and broad alluvial valleys along the major streams. The relief in this region is not pronounced. Upland prairies are flat to moderately hilly, and the valleys are shallow. The land surface is primarily controlled by bedrock, which has been only slightly modified by glacial drift deposits. While the southern boundary of the Mount Vernon Hill Country lies within a few miles of the limits of glaciations, moraine ridges are essentially absent in the area.

The highest elevation(s) (~576 feet above sea level) in Perry County are found in the northwest corner of the county near Swanwick. The lowest elevation(s) (~388 feet above sea level) are found in the central southern portion of the county near Pyatts. Figure 3-2 depicts the physiographic division within Perry County and it characteristics.

Figure 3-2: Physiographic Divisions of Perry County



Physiographic/Hill Shade Map
Source: USGS

Sources:

2007 Tiger Line Shape Files, US Census Geography Division, 2007, US Census Bureau, 28 May 2008, http://www.census.gov/geo/www/tiger/

State of Illinois Environmental Protection Agency, Big Muddy River Basin Interim Water Quality Management Plan, 1973

United States Department of the Interior Geological Survey, Topographic Maps, 1961-1996

Greater Egypt Regional Planning & Development Commission, The Comprehensive Plan for the Greater Egypt Region, 1964

USDA and US Forest Service, Description of "Ecological Subregions: Sections of the Conterminous United States, http://www.na.fs.fed.us/sustainability/ecomap/provinces/sec_223/s223.shtm, 7-8-08

3.2 Climate

Perry County climate is typical of Southern Illinois and is generally characterized by hot dry summers and cool wet winters. The variables of temperatures, precipitation, and snowfall can vary greatly from one year to the next. In summer, the average low is 64.8° F and average high is 87.8° F; however, daily maximum temperatures often exceed 103° F for the period of time (several weeks) between June and September.

During the fall and into the spring, freezing temperatures can occur any time between September and May. The average low and high temperatures in January are 15.3° F and 42.6° F, respectively. Average annual precipitation is 44.19 inches (NCDC data from 1971 to 2000). While the winters are generally cool, i.e. temperatures are above freezing most days. Extended

periods (days to a couple of weeks) of sub-freezing temperatures often occur and are sometimes accompanied by significant amounts of ice and snow.

3.3 Demographics

According the U.S. Census of 2007, Perry County has a population of 22,596. From 2000–2007, Perry County experienced a population decrease of -2.0%. The largest town in Perry County is Du Quoin with a population of approximately 6,346. The breakdown of population by incorporated areas is included in Table 3-1.

Table 3-1: Population by Community

Community	2007 Population	% of County
Village of Cutler	532	2.3%
City of Du Quoin	6,346	28.1%
City of Pinckneyville	5,407	24.0%
Village of St. Johns	214	0.9%
Village of Tamaroa	724	3.2%
Village of Willisville	691	3.1%
Rural Population	8,682	38.4%

Source: American Fact Finder, 2008 and Illinois MapStats, 2008

3.4 Economy

Illinois MapStats and Illinois Department of Employment Security reported for 2007 that 75% of the workforce in Perry County was employed in the private sector. The breakdown is included in Table 3-2. Public Administration represents the largest sector, employing approximately 24.7% of the workforce and generating approximately 29.6% of the earnings. The US Census 2007 annual per capita income (inflation adjusted) in Perry County is $17,759 compared to an Illinois average of $27,511.

Table 3-2: Industrial Employment by Sector

Industrial Sector	% of County Workforce (2007)
Agriculture, Forestry, Fishing, Hunting, and Mining	0.4%
Construction	4.1%
Manufacturing	18.2%
Wholesale Trade	1.4%
Retail Trade	12.0%
Transportation, Warehousing and Utilities	6.4%

Industrial Sector	% of County Workforce (2007)
Information	2.0%
Finance, Insurance, Real Estate, and Rental/Leasing	3.9%
Professional and Business Services	1.8%
Educational, Health, and Social Services	12.4%
Arts, Entertainment, Recreation, Accommodation and Food Services	10.5%
Other Services (except Public Administration)	2.4%
Public Administration	24.7%

Source: Illinois Department of Employment Security 2007 and Illinois MapStats, 2008

3.5 Industry

Perry County's major employers and number of employees are listed in Table 3-3. The largest employers are Pinckneyville Hospital and General Cable, which have 275 employees each. Cooper B-Line is the second largest, with 214 employees.

Table 3-3: Major Employers

Manufacturing				
Company Name	**Location**	**Established**	**Employees**	**Type of Business**
Cooper B-Line	Pinckneyville	1960	214	Metal Fabricating
Contempri Industries	Pinckneyville	2001	120	Prefabricated Houses
General Cable	Du Quoin	1963	275	Electric Cable
Educational, Health, and Social Services				
Pinckneyville Hospital	Pinckneyville	1951	275	Hospital
Marshall Browning Hospital	Du Quoin	1922	150	Hospital
Du Quoin Community Unity School District #300	Du Quoin	N/A	187	School District
Pinckneyville School District #50	Pinckneyville	N/A	162	School District

Public Administration				
Pinckneyville Correctional Center	Pinckneyville	1998	200	Correctional Facility
Perry County Government	Pinckneyville	1827	150	Government
State of Illinois Police	Du Quoin	N/A	152	Government

Source: Department of Commerce and Economic Opportunity, Community Profiles 2007 and Direct Contact

3.6 Land Uses and Development Trends

Pre-European settlement, Perry County was densely forested with few areas of prairie. Since settlement, agriculture, coal mining, and urbanization have dramatically altered the county's land cover. Today, agriculture is the predominant land cover in the county. This fact did not result because of great agricultural capabilities of the land as a major agricultural producer; neither did it occur because of maximum economic development potential resting in agricultural pursuits. Rather it is a result of the existence of large volumes of land which cannot rationally be occupied by major urban uses within the foreseeable future. As a result many agricultural uses have only limited agricultural potential. The western and northern portions of the county are the primary areas of agriculture use. Additional scattered areas are located within the urban core in segments which need not be utilized for urban expansion. These agricultural areas become the overflow areas of future growth. Corn is the primary crop, followed by soybeans, winter wheat, and hay.

In recent years, residential developments tend to focus in the Du Quoin and Pinckneyville areas. Residential land use has had few significant developments within the county. Du Quoin is experiencing a $7 million housing project on Madison Street. The largest communities within the county are the cities of Du Quoin (6,346) and Pinckneyville (5,407).

Commercial land use has historically been, and continues to be, concentrated within the business districts of the incorporated municipalities of the county. However, the most recent commercial growth has occurred in and around the city of Du Quoin and Pinckneyville. In Du Quoin, Wal-Mart has just remodeled its store.

Industrial land use has been strategically planned and concentrated within the Du Quoin Industrial Park and Pinckneyville Industrial Park. Pinckneyville is the predominant location for most of the industries in the county. The major industries in the county are Cooper B-Line, Contempri Industries Inc., and General Cable.

Coal mining was an important industry in Southern Illinois Region between the 1930s and 1980s. Although coal mining activities declined significantly between 1990 and 2002, a modest rejuvenation of the coal industry is occurring in Perry County. Strip mining has left an indelible mark on Perry County. In areas that were strip mined, particularly prior to Surface Mine Reclamation Action of 1977, the land has been left unsuitable for agriculture or significant commercial or residential development. These areas often contain large piles of mine spoil and deep pits filled with water that alter surface water drainage. In Perry County abandon strip mines are generally found in the southern portions of the county. Currently, 18-acres on East Cole Street near Du Quoin's Wastewater Treatment Plant are being reclaimed.

Public land use in Perry County includes schools, parks, playgrounds, public utilities, and transportation facilities. The major areas of public land use are located in the southern parts of the county, Pyramid State Park. Other major areas include the Pinckneyville-Du Quoin Airport, Pinckneyville Fairgrounds, and Du Quoin State Fairgrounds. Pinckneyville is anticipating a Route 127 bypass and community hospital to be constructed in the near future. Marshall Browning Hospital in Du Quoin recently opened an expansion in 2008.

Source: National Agricultural Statistics Service, Illinois County Estimates: Corn, Soybeans, and Wheat, 2006-2007

Greater Egypt Regional Planning & Development Commission, The Comprehensive Plan for the Greater Egypt Region, 1964

United States Department of the Interior Geological Survey, Topographic Maps, 1961-1996

3.7 Major Lakes, Rivers, and Watersheds

Perry County lies on the ridge of Mississippi River. The county crosses three eight-digit Hydrologic Unit Code (HUC) Watersheds: Big Muddy River Watershed, Lower Kaskaskia River Watershed, and Mississippi South River Watershed. There are seven significant lakes in Perry County: Pinckneyville Reservoir, Boulder North, Boulder South, Crystal, Big Beaver, Wesslyn Cut, Green River, and Du Quoin City Lake.

The Big Muddy River Watershed enters into the county from the north and covers the majority of the county. This watershed has a general slope toward the south and is drained by the Little Muddy River and Beaucoup Creek into the Big Muddy River, which flows into the Mississippi River.

The Lower Kaskaskia River Watershed covers a small portion of the northwest corner of the county and lies west of the Big Muddy River Watershed with a general slope to the northwest. It is drained by Mud Creek, which eventually flows to the Mississippi River.

The Mississippi South River Watershed covers a small portion of the southwest corner of the county and lies to the west of the Big Muddy River Watershed with a general slope toward the southwest. It is drained by Mississippi River.

Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard 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 sound risk assessment. 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 by a disaster, and the impact on community assets. A risk assessment consists of three components: hazard identification, vulnerability analysis, and risk analysis.

4.1 Hazard Identification/Profile

4.1.1 Existing Plans

The plans identified in Table 1-3 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, the flood analysis used the following plans: FIRM maps, U.S. Geological Survey digital elevation model, and the One-hundred and Five-hundred Year Flood zones for Unincorporated Areas in Illinois GIS data layer from the Illinois Geological Survey.

4.1.2 Planning Team

During Meeting #2, which occurred on October 15, 2008, the planning team developed and ranked a list of hazards that affect the county. The team reviewed historical hazards information and participated in a risk analysis using a projector and Excel spreadsheet; then discussed each hazard and developed a consensus of the risk for each.

The team identified tornadoes, earthquakes, and severe thunderstorms as the three most significant hazards affecting Perry County. The plan also identified Perry County's principal technological hazard as the transportation of hazardous materials.

4.1.3 National Hazard Records

In addition to these identified hazards, the MHMP planning committee reviewed the list of natural hazards prepared by FEMA. To assist the planning team, historical storm event data was compiled from the National Climatic Data Center (NCDC; http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll).

The NCDC data included 267 reported events in Perry County between December 2, 1950 and April 2, 2008. A summary table of events related to each hazard type is included in the hazard profile sections that follow. A list of the events, including additional sources that identify specific occurrences, are included as Appendix D. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC recorded latitude and longitude; the plotted events are included as Appendix E. The list of NCDC hazards is included in Table 4-1.

Table 4-1: Climatic Data Center Historical Hazards

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

4.1.4 Hazard Ranking Methodology

Based on planning team input, national datasets, and existing plans, Table 4-2 lists the hazards Perry County will address in this multi-hazard mitigation plan. In addition, these hazards ranked the highest based on the Risk Priority Index and discussed in section 4.1.5.

Table 4-2: Planning Team Hazard List

Hazard
Tornadoes
Earthquakes
Thunderstorms/ High Winds/ Hail/ Lightning
Flooding
Winter Storms
Transportation of Hazardous Materials
Ground Failure

4.1.5 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 befallen or could potentially befall 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 4-3 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 4-3: 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 4-4 gives four classifications of magnitude/severity.

Table 4-4: 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 member where then asked to rank the hazards. Table 4-5 identifies the RPI and ranking for each hazard facing Perry County.

Table 4-5: Perry County Hazards (RPI)

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Transportation of Hazardous Material Release	3 - Likely	8 - Catastrophic	24	1
Tornados	3 - Likely	8 - Catastrophic	24	2
Earthquakes	2 - Possible	8 - Catastrophic	16	3
Thunderstorms/ High Winds/Hail/ Lightning	4+ - Highly Likely	2 - Limited	8	4
Winter Storms	3 - Likely	2 - Limited	6	5
Flooding	3 - Likely	2 - Limited	6	6
Ground Failure	3 - Possible	2 - Limited	6	7

4.1.6 Jurisdictional Hazard Ranking

Because the jurisdictions in Perry County differ in their susceptibilities to certain hazards—for example, portions of Pinckneyville are located within the floodplain of Beaucoup Creek and is more likely to experience significant flooding than Tamaroa which is located a substantial distance away from any large stream or river which could potentially cause significant flooding—the hazards identified by the planning team were ranked by SIUC for each individual jurisdiction using the methodology outlined in Section 4.1.5. 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 4-6 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern).

Table 4-6: Hazard Rankings by Jurisdiction

Jurisdiction	Hazard						
	Tornado	HAZMAT	Earthquake	Thunder-storms	Flooding	Winter Storms	Ground Subsidence
Cutler	1	4	3	2	6	5	7
Du Quoin	1	2	3	4	6	5	7
Pinckneyville	1	5	3	4	2	6	7
St. Johns	1	2	3	4	6	5	7
Tamaroa	1	2	4	3	5	6	7
Willisville	1	4	3	2	6	5	7

Rankings: 1 being the highest concern to higher number which is a lesser concern.
NA = Not applicable

4.1.7 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 two approach to analyzing hazards as defined for HAZUS-MH. The approach includes substitution of selected default data with local data. Level two analysis significantly improves the accuracy of the model predictions.

HAZUS-MH generates a combination of site-specific and aggregated loss estimates depending upon the analysis options that are selected and upon the input that is provided by the user. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across census blocks/tracts. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks/tracts. 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. It is only intended to highlight the major steps that were followed during the project.

Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures takes into account the depth of water in relation to the structure. HAZUS-MH also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure falls into a structural class, and that structures in each class will respond in similar fashion to a specific depth of flooding. Site-specific analysis is also based upon a point location rather than a polygon; therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site-specific structures as well as for aggregate structural losses need to be viewed as

approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

The following events were analyzed. The parameters for these scenarios were created using GIS, HAZUS-MH, and historical information to predict which communities would be at risk.

Using HAZUS-MH

1. 100-year overbank flooding
2. Earthquake

Using GIS

1. Tornado
2. Hazardous Material Release

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 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 SIU-Polis, verified the datasets using local knowledge, and allowed SIU-Polis to use their local GIS data for additional verification. SIU-Polis 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 allow a level two analysis. This update process improved the accuracy of the model predictions.

The default HAZUS-MH data has been updated as follows:

- The HAZUS-MH defaults, critical facilities, and essential facilities have been updated based on most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts at each county.
- 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.
- Parcels with assessment improvements (buildings) values were used to estimate the number of buildings in the flood-prone areas.
- The analysis is restricted to the county boundaries. Events that occur near the county boundary do not contain damage assessments from the adjacent county.

4.2.1.2 Essential Facilities List

Table 4-7 identifies the essential facilities that were added or updated for the analysis. A complete list of the critical facilities is included as Appendix F. A map of all the critical facilities is included as Appendix G.

Table 4-7: Essential Facilities List

Facility	Number of Facilities
Care Facilities	2
Emergency Centers	2
Fire Stations	7
Police Stations	4
Schools	13

4.2.1.3 Facility Replacement Costs

Default HAZUS-MH building stock data were used for the HAZUS-MH analyses. Facility replacement costs and total building exposure are identified in Table 4-8. Table 4-8 also includes the estimated numbers of buildings within each occupancy class.

Table 4-8: Building Exposure (default HAZUS-MH) for Perry County

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Agricultural	122	$18,257
Commercial	429	$176,694
Education	19	$21,454
Government	23	$14,857
Industrial	122	$108,454
Religious/Non-Profit	67	$43,559
Residential	10,830	$1,047,513
Total	**11,612**	**$1,430,788**

Perry County provided parcel points without assessed values. The Assessors data did not contain building replacement cost information and other building characteristics, and thus could not be used for the census block aggregated HAZUS-MH analysis. The parcel data was used to estimate the actual number of buildings within the modeled hazard areas.

4.3 Future Development

Perry County is subject to a variety of natural disasters. County government, in partnership with State government, must make a commitment to prepare for those types of disasters. Likewise, the Perry County manufacturing base leaves the county vulnerable to major hazardous materials

events and other technological threats. However, as the county-elected and appointed officials become better informed on the subject of community hazards, they will be better able to set and direct policies that will enable emergency management and county response agencies to effectively plan, train, and exercise. The end result will be a stronger community and a better place in which to work, live, and grow.

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition for Tornado Hazard

Tornadoes pose a great risk to the State of Illinois and its citizens. Tornadoes historically have occurred during any month of the year. The unpredictability of tornadoes makes them one of Illinois' most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 mph, but higher and lower values can occur. A wind velocity of 200 mph will result in a wind 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 around debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. The tornado scale ranges from low intensity F0, with effective wind speeds of 40 to 70 mph, to F5 tornadoes with effective wind speeds of over 260 mph. The Fujita intensity scale is included in Table 4-9.

Table 4-9: Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
0 (Gale)	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.
1 (Moderate)	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.
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 for Tornado Hazard

There have been several occurrences of tornadoes within Perry County during recent decades. The NCDC database reported 13 tornadoes/funnel clouds in Perry County since 1950. These tornadoes are attributed with one death, 16 injuries and $2.75 million in property damage.

On March 11, 2006, a tornado entered Perry County, IL from Randolph County approximately 1.5 miles south of Highway 154. The Perry County segment of the tornado was rated at its maximum intensity and width shortly after crossing the county line. The tornado continued on a northeast movement, passing northwest of Pinckneyville, and weakened to F1 intensity. Near where it crossed Illinois Route 13, trees were uprooted, roofs were blown off, and power poles were snapped. Siding was blown off a house. Near the end of the tornado track, just northwest of Tamaroa, a metal building was destroyed. Debris from the building was blown approximately 400 yards. A nearby house lost all of its shingles. Along the 20-mile path through Perry County, dozens of barns and outbuildings were severely damaged or destroyed.

Perry County tornadoes recorded in the NCDC database are identified in Table 4-10. Additional details for NCDC events are included in Appendix D.

Table 4-10: Perry County Tornadoes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Perry	12/18/1957	Tornado	F3	0	1	250K	0
Perry	12/18/1957	Tornado	F5	1	6	250K	0
Perry	9/26/1959	Tornado	F1	0	0	3K	0
Perry	12/21/1967	Tornado	F3	0	0	250K	0
Perry	5/7/1973	Tornado	F2	0	0	0	0
Perry	6/17/1973	Tornado	F0	0	0	0	0
Perry	5/29/1982	Tornado	F3	0	0	250K	0
Perry	5/29/1982	Tornado	F3	0	7	250K	0
Old Duquoin	4/19/1996	Tornado	F1	0	0	50K	0
Swanwick	4/15/1998	Tornado	F0	0	0	0	0
Pinckneyville	5/31/2001	Tornado	F0	0	0	0	0
Pinckneyville	5/30/2004	Tornado	F1	0	0	250K	0
Cutler	3/11/2006	Tornado	F2	0	2	1.2M	0

Source: NCDC

* 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 same risk for occurrence of tornadoes. They can occur at any location within the county.

Hazard Extent for Tornado Hazard

The historical tornadoes listed previously generally move from west to east across the county—although many other tracks are possible—from more southerly to northerly. The extent of the hazard varies both in terms of the extent of the path and the wind speed.

Calculated Risk Priority Index for Tornado Hazard

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

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	8	=	24

Vulnerability Analysis for Tornado Hazard

Tornadoes can occur within any area of 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 Perry County are discussed in types and numbers in Table 4-8.

Critical Facilities

All critical facilities are vulnerable to tornadoes. A critical facility will encounter 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, debris (trees or limbs) causing damage, 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 4-7 lists the types and numbers of all of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure for the entire county is listed in Table 4-8. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, and loss of building function (e.g. a 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 equally vulnerable, it is important to emphasize that any number of these items could become damaged during a tornado. 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 fail or become impassable causing risk to traffic.

An example scenario is described as follows to illustrate the anticipated impacts of tornadoes in the county in terms of numbers and types of buildings and infrastructure.

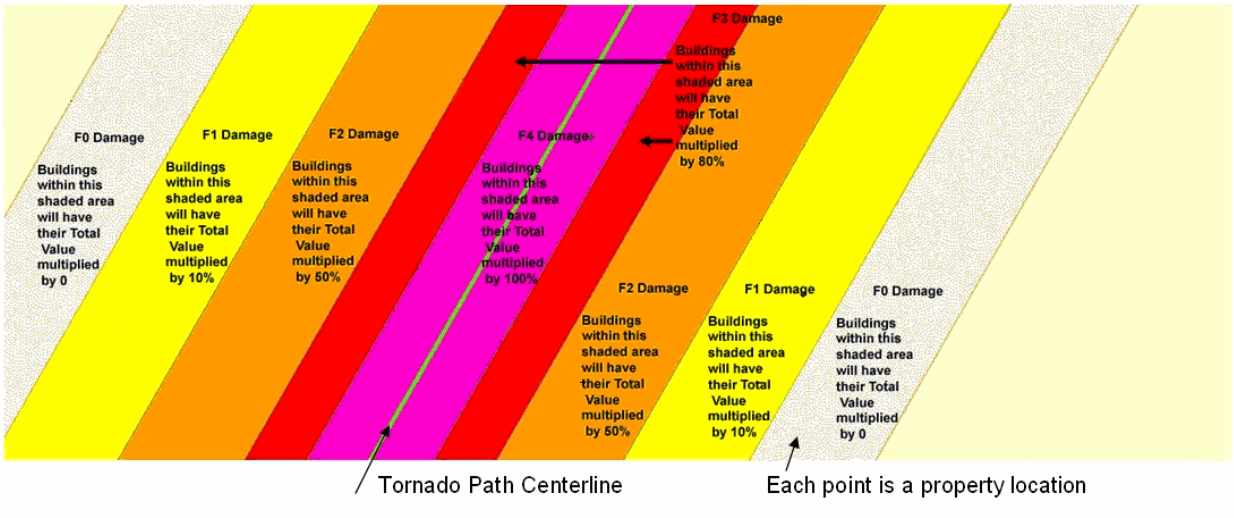
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based upon the F4 tornado event that would run for 27 miles through the town of Pinckneyville. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based 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 4-11 depicts tornado damage curves as well as path widths.

Table 4-11: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
F-5	3000	100%
F-4	2400	100%
F-3	1800	80%
F-2	1200	50%
F-1	600	10%
F-0	300	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with a decreasing amount of damage away from the center of the path. This natural process was modeled in GIS by adding damage zones around the tornado path. Figure 4-1 and Table 4-12 describe the zone analysis.

Figure 4-1: GIS Analysis Using Tornado Buffers



Once the hypothetical route is digitized on the map, several buffers are created to model the damage functions within each zone.

An F4 tornado has four damage zones. Total devastation is estimated within 150 feet of the tornado path (the darker-colored Zone 1). The outer buffer is 900 feet from the tornado path (the lightest-colored Zone 4), within which 10% of the buildings will be damaged.

Table 4-12: Tornado Zones and Damage Curves

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

The selected hypothetical tornado path is depicted in Figure 4-2, and the damage curve buffers are shown in Figure 4-3.

Figure 4-2: Hypothetical F4 Tornado Path in Perry County

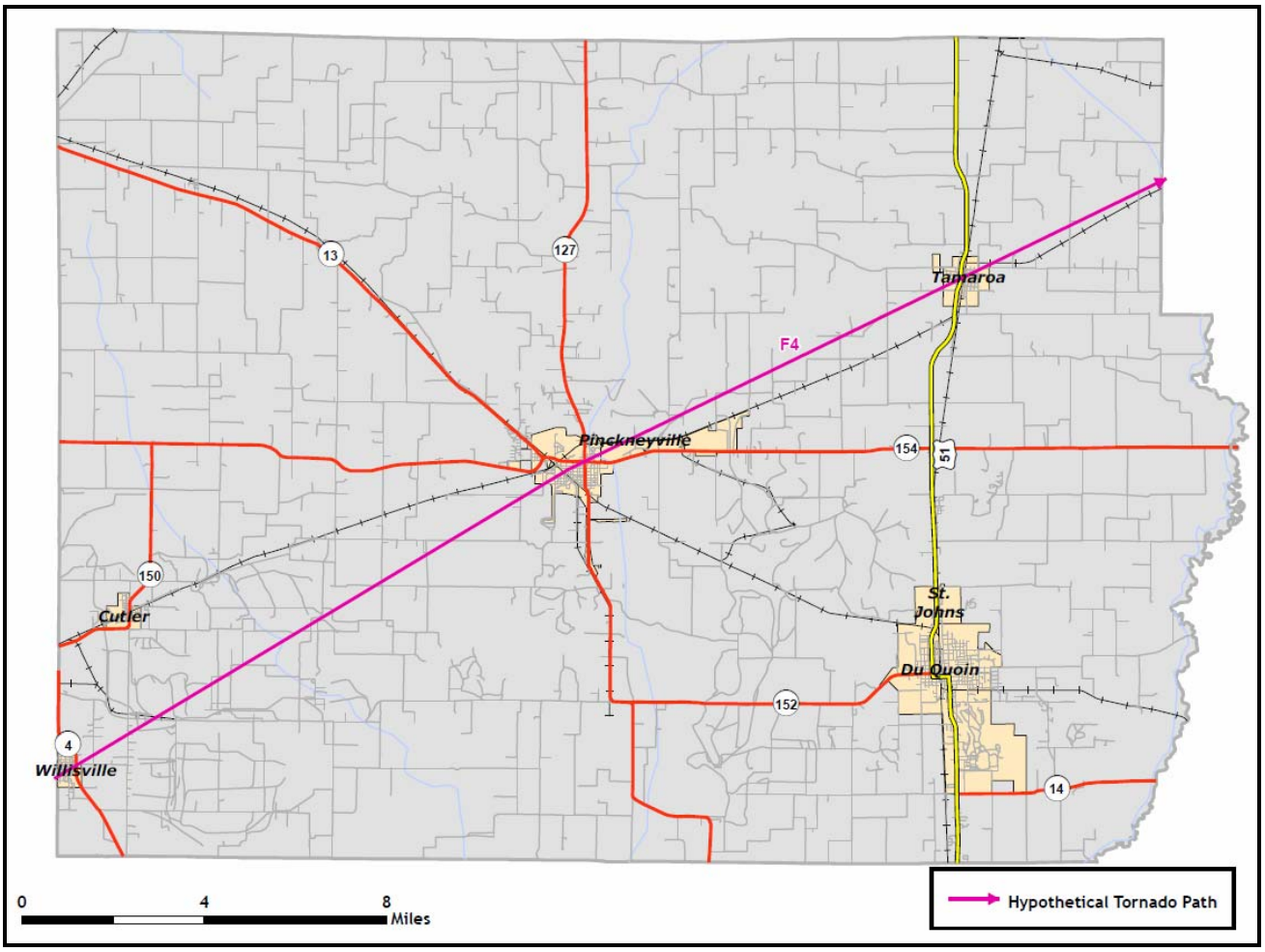
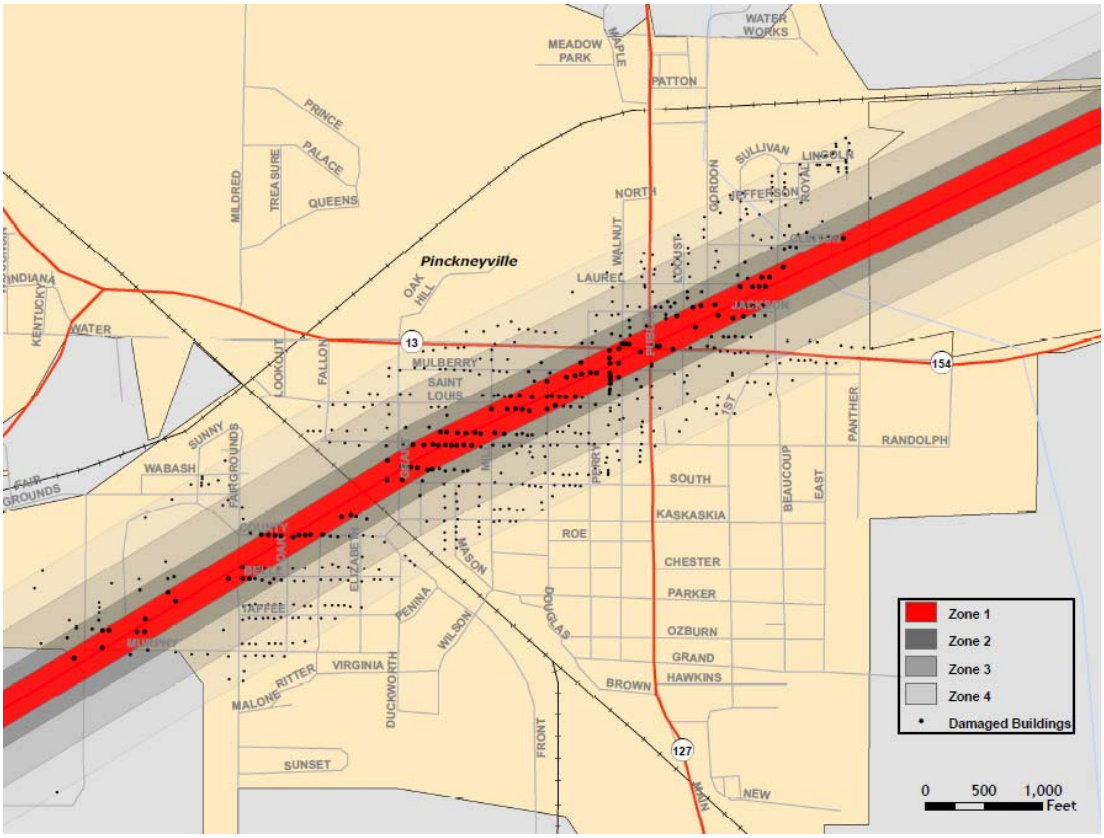


Figure 4-3: Modeled F4 Tornado Damage Buffers in Perry County



The results of the analysis are depicted in Tables 4-13 and 4-14. The GIS analysis estimates that 1,034 buildings will be damaged. The estimated building losses were $174 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Perry County that were joined with Assessor records showing property improvement.

The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable. For purposes of analysis, the total number of buildings and the building replacement costs for government, religious/non-profit, and education should be lumped together.

Table 4-13: Estimated Numbers of Buildings Damaged

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Total	178	186	311	360

Table 4-14: Estimated Building Losses by Occupancy Type (X 1000)

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$14,657	$14,971	$32,293	$3,5471
Commercial	$5,326	$3,382	$16,672	$8,618
Industrial	$4,850	$4,466	$6,786	$9,599
Agriculture	$53	$118	$374	$310
Religious	$2,445	$2,166	$3,327	$785
Government	$6,759	$624	$555	$94
Education	$1,142	$1,247	$1,836	$1,426
Total	**$35,231**	**$26,976**	**$61,838**	**$56,307**

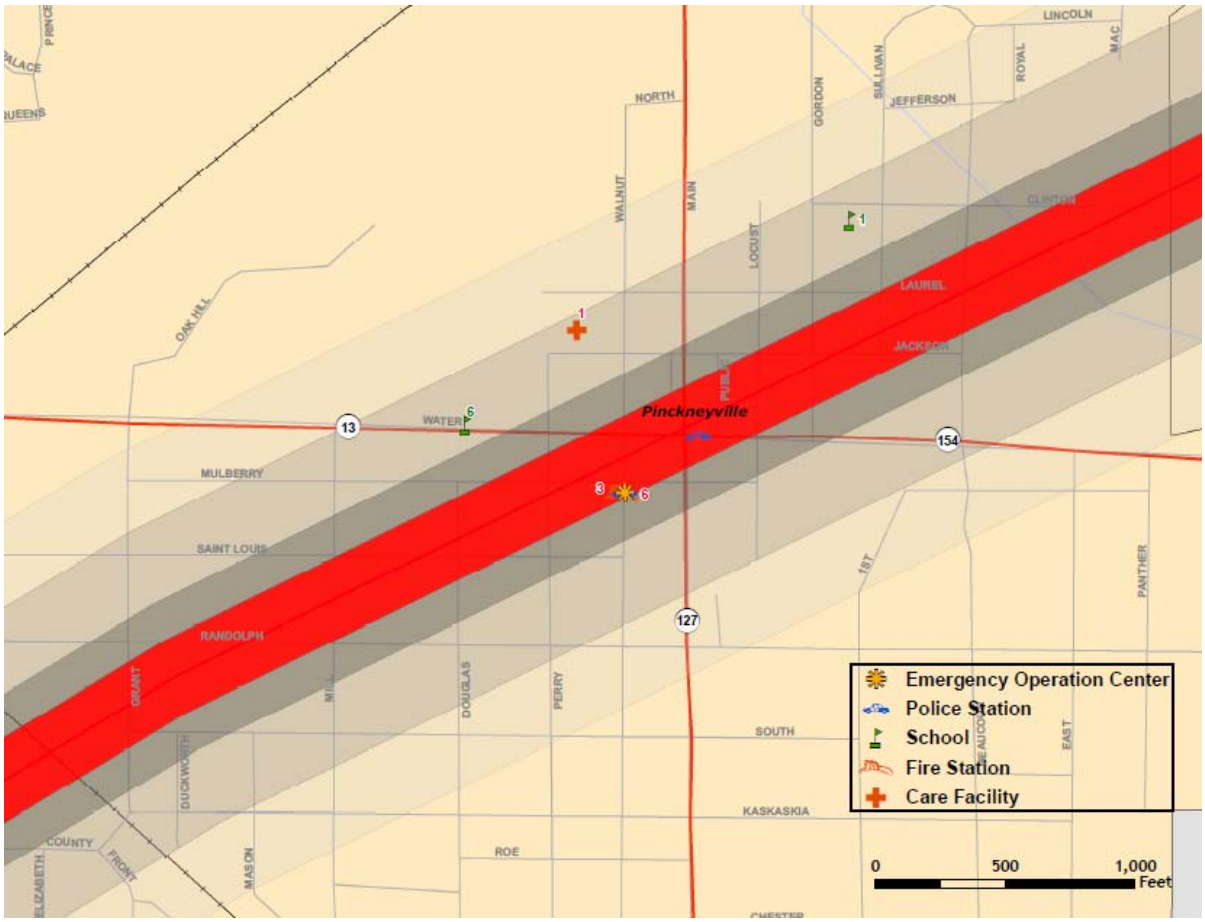
Essential Facilities Damage

There are 10 essential facilities located within 900 feet of the hypothetical tornado path. The model predicts that one medical care facility, two schools, one emergency operation center, two police stations, and four fire stations would experience damage. The affected facilities are identified in Table 4-15, and their geographic locations are shown in Figure 4-4.

Table 4-15: Estimated Essential Facilities Affected

Name
Pinckneyville Community Hospital
Pinckneyville Emergency Services
Pinckneyville Fire Department
Tamaroa Fire Protection District
Willisville Fire Department
Pinckneyville Rural Fire Protection District
Pinckneyville Police Department
Perry County Sheriff's Office
St. Bruno Catholic School
Pinckneyville Elementary School
Perry County Court House

Figure 4-4: Essential Facilities within Tornado Path



Vulnerability to Future Assets/Infrastructure for Tornado Hazard

The entire population and buildings have been identified as at risk because tornadoes can occur anywhere within the State of Illinois, 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 Perry County is included in Table 4-8.

All critical facilities in the county and its communities are at risk. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Analysis of 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 should be built with sturdier construction, and existing structures should be hardened to lessen the potential impacts of severe weather. Community sirens to warn of approaching storms are also vital to ensuring the safety of Perry 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 into 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 eighteen 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 where they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at anytime 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 large 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 land-ward 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 can not 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. When that maximum is exceeded by more than the design safety margin, then 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 frequency 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 19 flood events in Perry County since 1993. These flood events have been attributed with $293,000 in property damage. For example, on March 12, 2006, widespread flash flooding inundated thousands of acres, including an area west of Du Quoin along Route 152. All low-lying areas near creeks were under water.

At the Pinckneyville-Du Quoin Airport, floodwaters covered the runway and crept up to the hangar building. Two sections of U.S. Route 51 north of Tamaroa were closed due to high water. Secondary roads were closed due to flooding in the northwest quarter of the county. Flooding was reported on Highway 13 between Pinckneyville and Coulterville. The county emergency manager reported the countywide average rainfall at 10 inches.

Significant Perry County floods recorded by the NCDC are shown in Table 4-16. A list of flood events and additional sources that provide information about the significant flood events are included in Appendix D. Historical flood crests and discharges at hydrologic monitoring stations are summarized in Appendix H.

Table 4-16: Perry County Previous Occurrences of Flooding*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Swanwick	9/23/1993	Flash Flood	N/A	0	0	1K	0
Du Quoin	11/14/1993	Flash Flood	N/A	0	0	5K	0
Perry	5/18/1995	Flash Flood	N/A	0	0	0	0
Pinckneyville	4/28/1996	Flash Flood	N/A	0	0	220K	0
Du Quoin	6/29/1998	Flash Flood	N/A	0	0	50K	0
Perry	1/21/1999	Flash Flood	N/A	0	0	0	0
Du Quoin	4/3/1999	Urban/sml Stream Fld	N/A	0	0	0	0
Du Quoin	6/16/2000	Flash Flood	N/A	0	0	10K	0
Pinckneyville	7/12/2000	Urban/sml Stream Fld	N/A	0	0	0	0
Du Quoin	7/18/2001	Urban/sml Stream Fld	N/A	0	0	0	0
Perry	5/8/2002	Urban/sml Stream Fld	N/A	0	0	7K	0
Pinckneyville	6/27/2002	Flash Flood	N/A	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Pinckneyville	12/18/2002	Urban/sml Stream Fld	N/A	0	0	0	0
Tamaroa	5/6/2003	Flash Flood	N/A	0	0	0	0
Pinckneyville	3/28/2004	Flash Flood	N/A	0	0	0	0
Tamaroa	5/25/2004	Flash Flood	N/A	0	0	0	0
Cutler	6/18/2004	Flash Flood	N/A	0	0	0	0
Du Quoin	8/28/2004	Flash Flood	N/A	0	0	0	0
Perry	3/12/2006	Flash Flood	N/A	0	0	0	0

Source: NCDC

* 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 for Dam and Levee Dam Failure

According to the Perry County planning team, there are no records or local knowledge of any dam or certified levee failure in the county.

Repetitive Loss Properties

FEMA defines a repetitive loss structure as a structure covered by a contract of flood insurance issued under the National Flood Insurance Program (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 25% of the market value of the structure at the time of each flood loss.

Illinois Emergency Management was contacted to determine the location of repetitive loss structures. Perry County has one repetitive loss structure within the county. The total amount paid for building replacement and building contents for damages to these repetitive loss structures was $9,903.14. Table 4-17 describes the loss structures in terms of occupancy and jurisdiction.

Table 4-17: Perry County Repetitive Loss Structures

Jurisdiction	Occupancy Type	Number of Structures	Number of Losses	Total Paid
Perry County	Single-Family	1	2	$9,903.14
Totals		**1**	**2**	**$9,903.14**

Geographic Location for Flooding

Most riverine flood in Illinois occurs during either the spring or summer and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Flash flooding in Illinois can occur during anytime of the year, but tends to be less frequent and more localized between mid-summer and early winter.

The primary sources of river flooding in Perry County are the Beaucoup Creek and Little Muddy River. Beaucoup Creek flows through the central portion of Perry County and can potential inundate portions of Pinckneyville. Galum Creek, a major tributary to Beaucoup Creek, can potentially inundate a significant area between Union School Road and State Route 127 in the south central portion of the county. These areas are mostly agricultural. However, flooding along Beacoup Creek and its tributaries has closed important transportation routes such as State Routes 127, 152, and 154. The flooding along Little Muddy River generally inundates agricultural areas in the extreme eastern portion of the county. However, a major tributary to the Little Muddy River, Reese Creek, can impact a small area in northeast corner of Du Quoins. Flooding along the Little Muddy River and its tributaries has resulted in the closure of State Routes 14 and 154. The areas of riverine flooding are depicted on the map in Appendix E.

Flash flooding in Perry County typically occurs or is best documented in urban/developed areas. For example flash flooding has resulted in the closure of US 51 through Du Quoin and several side streets in the towns of Du Quoin and Pinckneyville.

A digital file of the FIRM maps was used to identify specific stream reaches for analysis. The areas of riverine flooding are depicted on the map in Appendix E.

In Meeting #4, held on January 22, 2009, the planning team members listed a voluntary buyout option as a mitigation strategy to alleviate damage to structures within the county's flood plain. They identified potential hazard areas in which this program may prove valuable. The results are listed in Table 4-18.

Table 4-18: Potential Voluntary Buyout Properties

Jurisdiction	Number of Structures	Road	Stream/River Floodplain
Perry County	2	White Walnut Road	Little Beaucoup Creek
Perry County	up to 5	North Mud Line	Tributary to Beaucoup Creek
Perry County	1	Matthews Road	Beaucoup Creek
Perry County	1	East Park Street	East Creek
Perry County	1	Wolf Road	Tributary to Beaucoup Creek
Perry County	2	Wolverine Road	Galum Creek
Perry County	1	Mustang Road	Galum Creek
Perry County	2	Titmouse Road	Little Muddy River
Perry County	3	Purple Martin Road	Swanwick Creek
Perry County	1	Deer Run Road	Swanwick Creek

Geographic Location for Dam and Levee Failure

The National Inventory of Dams identified nine dams in Perry County. The map in Appendix E illustrates the location of Perry County dams. Table 4-19 summarizes the National Inventory of Dams information.

Table 4-19: National Inventory of Dams

Name	River/Stream	Hazard	EAP
Pinckneyville Reservoir	Opossum Creek	S	Y
New Cherry Lake Dam	Reese Creek	L	N
Headquarters Lake Dam	Pipestone Creek	S	N
Foerich Pond Dam	Tributary to Little Muddy River	L	N
Lake Du Quoin Dam	Reese Creek	S	N
Elks Reservoir Dam	Panther Creek	L	N
Yearhing Lake Dam	Galum Creek	L	N
Kathleen Mine	Unknown	S	N
Fidelity Mine No. 11	Unknown	L	N

A review of the Illinois Department of Natural Resource's (IDNR) files identified no state or federal levees within Perry County.

Hazard Extent for Flooding

The HAZUS-MH flood model is designed to use a flood depth grid and flood boundary polygon from the FIRM data. HAZUS-MH was used to model the Base Flood Elevation (BFE). The BFE is defined as the area that has a 1% chance of flooding in any given year. Planning team input and a review of historical information provided additional information on specific flood events.

Hazard Extent for Dam and Levee Failure

Dams assigned the low (L) hazard potential classification are those where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property. Dams assigned the significant (S) hazard classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. 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 where failure or mis-operation has the highest risk to cause loss of human life and significant damage to buildings and infrastructure.

According to the IDNR and the National Inventory of Dams, there are no dams in Perry County classified as a high hazard dams. One dam, Pinckneyville Reservoir Dam, has an Emergency Action Plan (EAP). An EAP is not required by the State of Illinois but is recommended by 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 better 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 private individuals or organizations such as local levee districts—are responsible for ensuring that the levees they own

are maintained to their original design level and condition. In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove that the levee meets design, operation, and maintenance standards for protection against the 1% annual probability (100-year) flood.

Calculated Risk Priority Index for Flooding

Based on historical information and the HAZUS-MH flooding analysis results, the probability of flooding in Perry County is likely. According to the Risk Priority Index (RPI), flooding ranked as the number four hazard.

RPI = Probability x Magnitude/Severity.

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

Vulnerability Analysis for Flooding (HAZUS-MH Analysis Using 100-Year Flood Boundary and Default Building Inventory)

HAZUS-MH generated the flood depth grid for a 100-year return period and made calculations by clipping the USGS 30-m DEM to the flood boundary. Next, HAZUS-MH estimated the damages for Perry County by utilizing default aggregate building inventory census data.

Building Inventory

A table of the building replacement costs (types and numbers of buildings) for the facilities identified in the flood areas are listed in Table 4-20. These buildings can expect impacts similar to those discussed for the critical facilities. These include structural failure, extensive water damage to the facility, and loss of facility functionality (e.g. residential buildings may no longer be able to provide shelter to their inhabitants).

Table 4-20: Perry County HAZUS-MH Analysis Total Economic Loss (100-Year Flood)

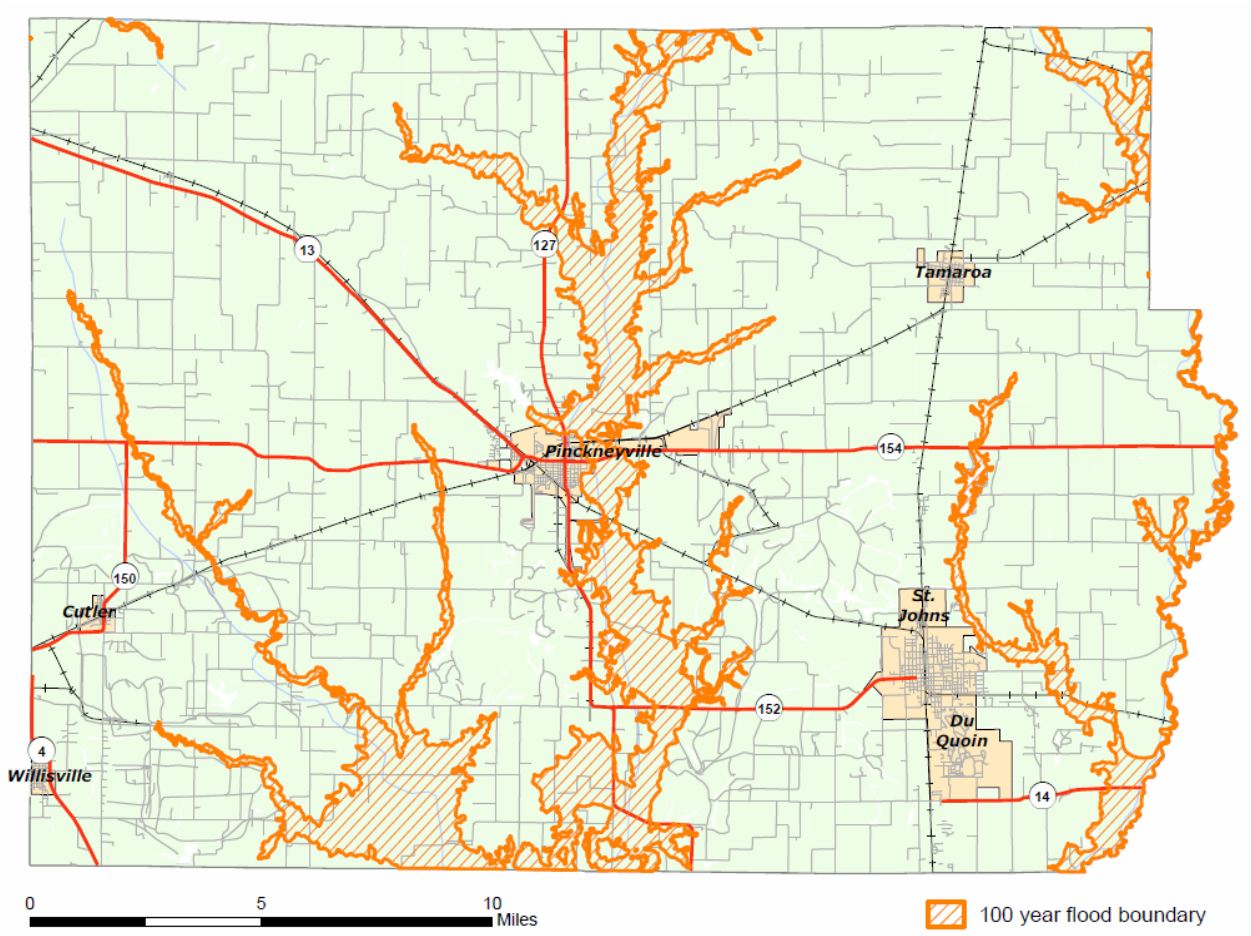
General Occupancy	Total Damaged Buildings	Building Loss (X 1000)	Total Economic Loss (X 1000)
Agricultural	0	$237	$934
Commercial	0	$351	$996
Education	0	$105	$0
Government	0	$1	$21
Industrial	3	$3,020	$13,876
Religious/Non-Profit	0	$38	$251
Residential	7	$5,029	$7,735
Total	**10**	**$8,781**	**$23,813**

The reported building counts should be interpreted as degrees of loss rather than exact numbers of buildings exposed to flooding. These numbers were derived from aggregate building

inventories, which were assumed to be dispersed evenly across census blocks. HAZUS-MH requires that a predetermined amount of square footage of a typical building sustains damage in order to produce a damaged building count. If only a minimal amount of building damage is predicted, it is possible to see no damaged building counts, even while seeing economic losses.

Figure 4-5 depicts the flood boundary from the HAZUS-MH analysis. HAZUS-MH estimates the 100-year flood would damage 10 buildings, totaling $8.7 million in building losses and $23.8 million in economic losses.

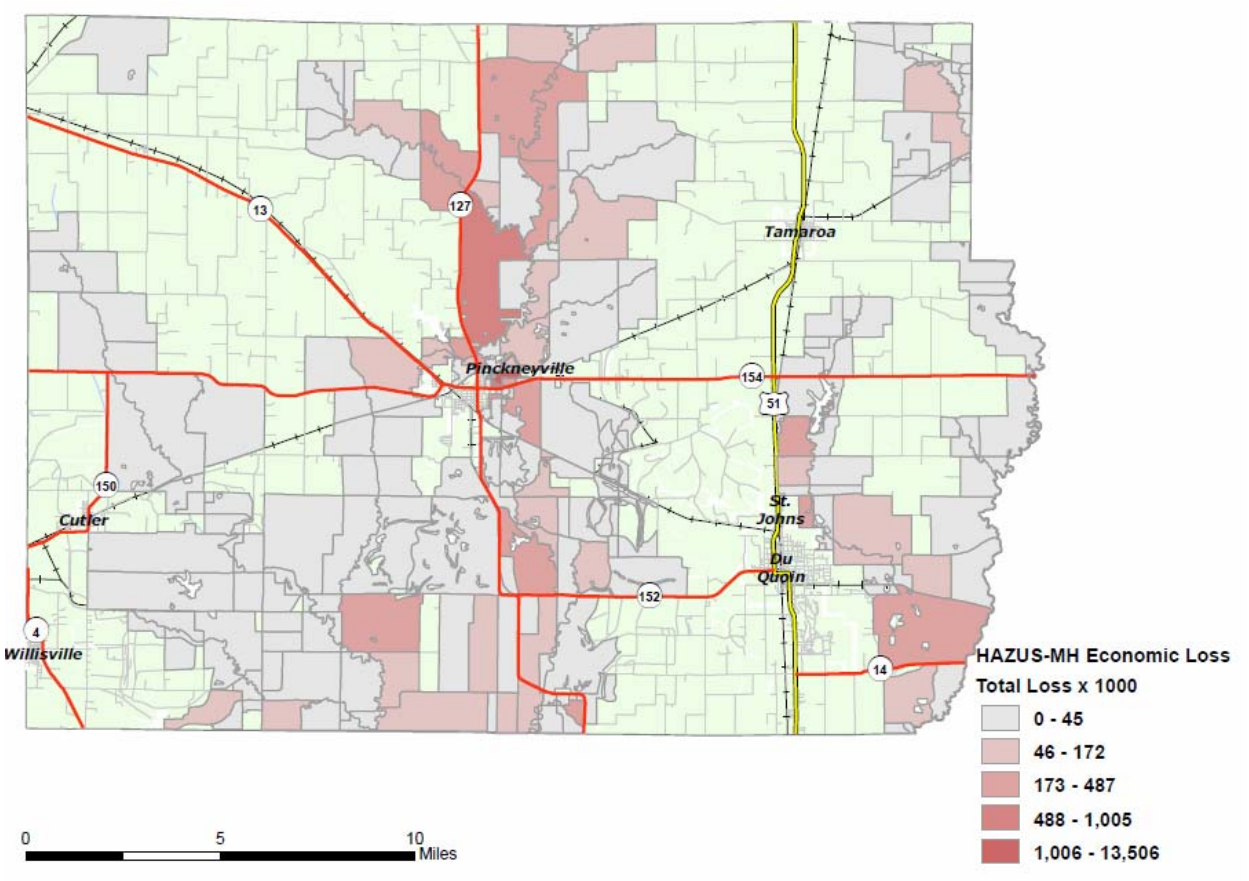
Figure 4-5: Perry County HAZUS-MH Analysis (100-Year Flood)



HAZUS-MH estimates two census blocks affected by the modeled flood event, with losses exceeding $1 million. The distribution of losses is shown in Figure 4-6.

HAZUS-MH aggregate loss analysis is evenly distributed across a census block. Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be overstated.

Figure 4-6: Perry County Total Economic Loss (100-Year Flood)



GIS Analysis Using 100-Year Flood Boundary and County Addresses

HAZUS-MH generated the flood depth grid for a 100-year return period and made calculations by clipping the USGS 30-m DEM to the flood boundary. Next, a GIS analysis of Perry County with site-specific structures data provided by the county was utilized.

The analysis estimates the 100-year flood would damage 50 buildings. Figure 4-7 depicts the Perry County structures (flood-prone buildings) that fall within the 100-year floodplain. Figure 4-8 highlights damaged buildings within the floodplain areas in Pinckneyville.

Figure 4-7: Perry County Buildings in Floodplain (100-Year Flood)

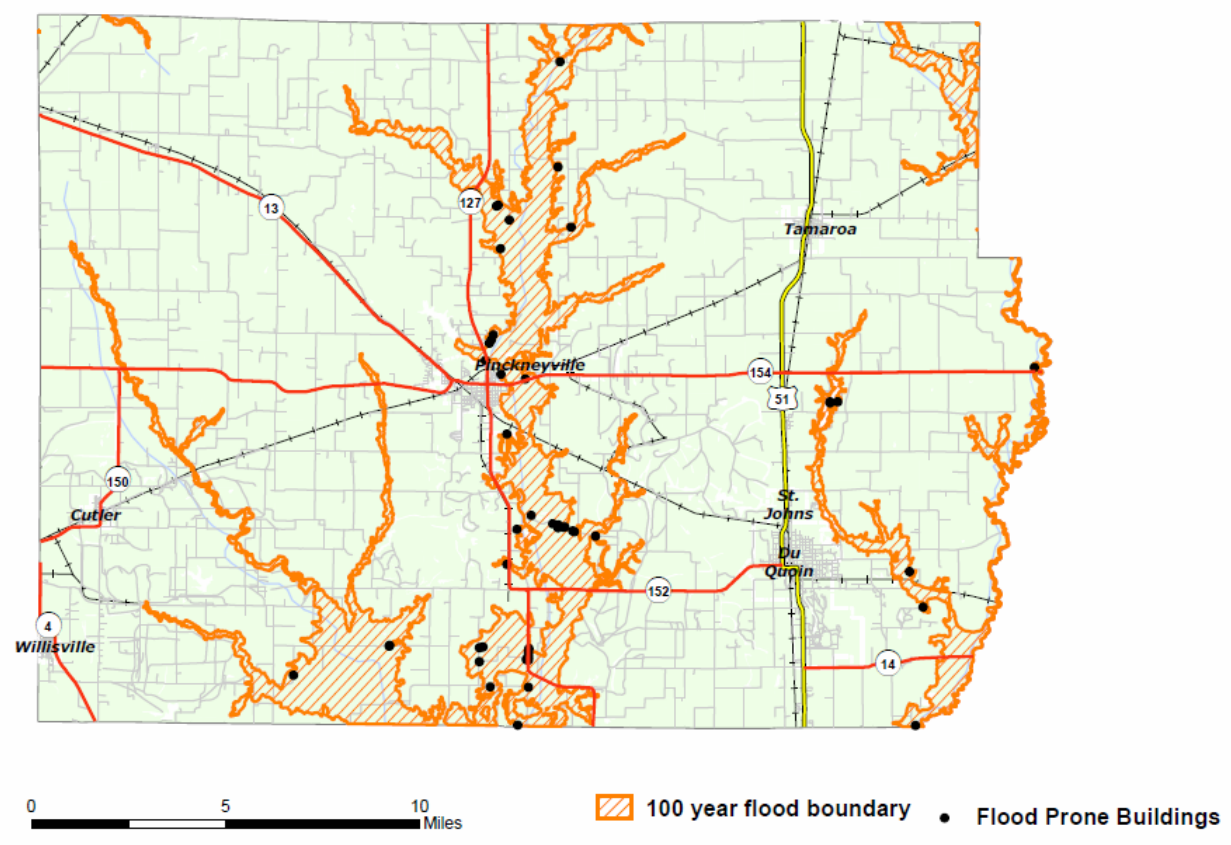
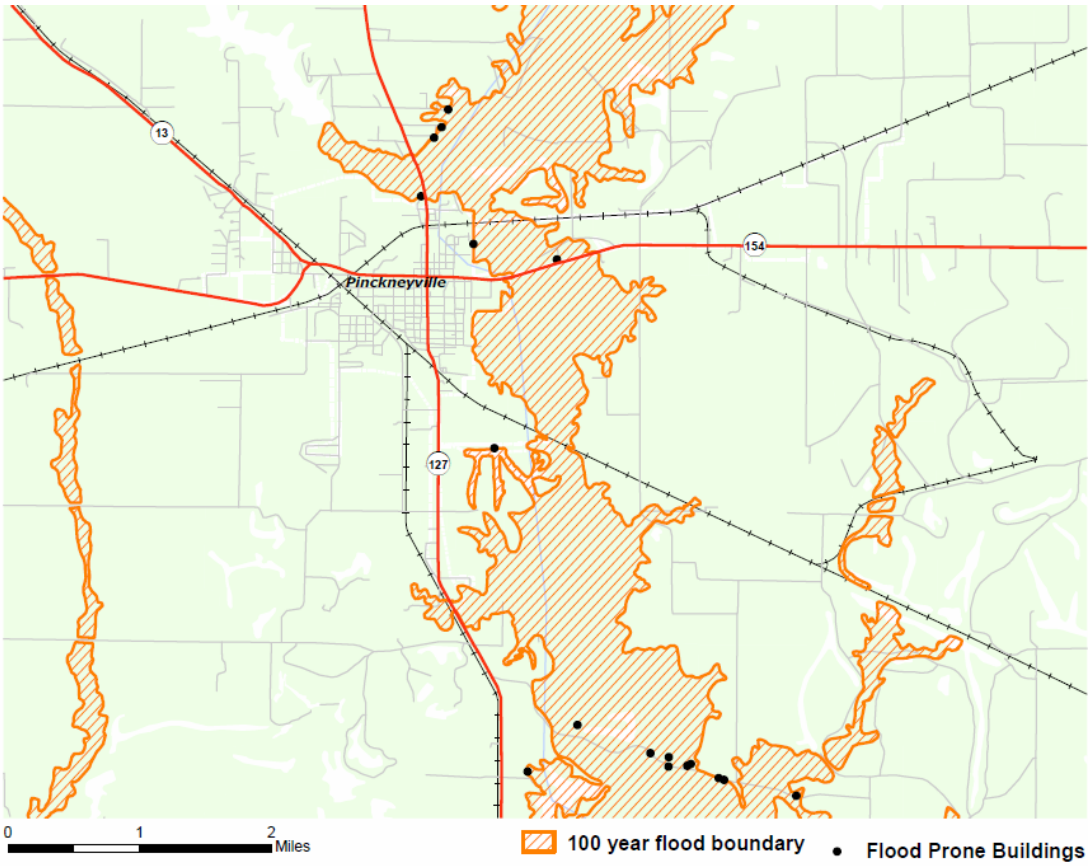


Figure 4-8: Perry County Urban Areas Pinckneyville Flood-Prone Areas (100-Year Flood)



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 fail or become impassable, causing a traffic risk.

Vulnerability Analysis for Flash Flooding

Flash flooding could affect any location within this jurisdiction; therefore, the entire county's population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Vulnerability Analysis for Dam and Levee Failure

An EAP is required to assess the effect of dam failure on these communities. 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 1% annual probability flood.

Vulnerability to Future Assets/Infrastructure for Flooding

Flash flooding may affect any low lying areas within the county; therefore many buildings and infrastructure are vulnerable to flash flooding. Currently, the Perry County Zoning Board of Appeals reviews new development for compliance with the local zoning ordinance. At this time no construction is planned within the area of the 100-year floodplain. Therefore, there is no new construction, which will be vulnerable to a 100-year flood.

Vulnerability to Future Assets/Infrastructure for Dam and Levee Failure

The Perry County Zoning Board of Appeals reviews new development for compliance with local zoning ordinances.

Analysis of Community Development Trends

Areas with recent development within the county may be more vulnerable to drainage issues. Storm drains and sewer systems are usually most susceptible, which can cause the 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. Controlling floodplain development is the key to reducing flood-related damages.

4.4.3 Earthquake Hazard

Hazard Definition for Earthquake Hazard

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, plate tectonics has shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. At their boundaries, the plates typically are locked together and unable to release the accumulating energy. When this energy grows strong enough, the plate boundary breaks free and causes the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area in the Midwest U.S. is the New Madrid Seismic Zone. Scientists have learned that the New Madrid fault system may not be the only fault system in the Central U.S. capable of producing damaging earthquakes. The Wabash Valley fault system in Illinois and Indiana manifests evidence of large earthquakes in its geologic history, and there may be other, as yet unidentified, faults that could produce strong earthquakes.

Ground shaking from strong earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated materials and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage. Magnitude measures the energy released at the source of the earthquake. Magnitude is determined from measurements on seismographs, and a single earthquake will have a single magnitude to quantify its strength. Earthquake intensity measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, human structures, and the natural environment, and a single earthquake will have a wide range of intensity values at different locations around the epicenter. Table 4-21 is a description of earthquake intensity using an abbreviated Modified Mercalli Intensity scale, and Table 4-22 lists earthquake magnitudes and their corresponding intensities.
(Source: *http://earthquake.usgs.gov/learning/topics/mag_vs_int.php*)

Table 4-21: Abbreviated Modified Mercalli Intensity Scale

Mercalli Intensity	Description
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 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.

Mercalli Intensity	Description
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.

Table 4-22: Earthquake Magnitude vs. Modified Mercalli Intensity Scale

Earthquake Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	I
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - IX
7.0 and higher	VIII or higher

Historical Earthquakes that have Affected Perry County

Numerous instrumentally measured earthquakes have occurred in Illinois. 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. Microseismic events are usually only detectable by seismographs and rarely felt by anyone. The most recent earthquake in Illinois—as of the date of this report—occurred on June 1, 2008 at 8:56:12 local time about 35 km (25 miles) southeast of Olney, IL and measured 1.6 in magnitude.

The consensus of opinion among seismologists working in the Midwest is that a magnitude 5.0 to 5.5 event could occur virtually anywhere at any time throughout the region. Earthquakes occur in Illinois all the time, although damaging quakes are very infrequent. Illinois earthquakes causing minor damage occur on average every 20 years, although the actual timing is extremely variable. Most recently, a magnitude 5.2 earthquake shook southeastern Illinois on April 18, 2008, causing minor damage in the Mt Carmel, IL area. Earthquakes resulting in more serious damage have occurred about every 70 to 90 years.

First on the list of historical earthquakes that have affected Illinois and first on the list on continuing earthquake threats at present and into the future is seismic activity on the New Madrid Seismic Zone of south-eastern Missouri. On December 16, 1811 and January 23 and February 7 of 1812, three earthquakes struck the central U.S. with magnitudes estimated to be 7.5-8.0. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment *(sand blows)* over an area of >10,500 km^2, and uplift of a 50 km by 23 km zone (the Lake County uplift). The shaking rang church bells in Boston, collapsed scaffolding on the

Capitol in Washington, D.C., and was felt over a total area of over 10 million km^2 (the largest felt area of any historical earthquake). Of all the historical earthquakes that have struck the U.S., an 1811-style event would do the most damage if it recurred today.

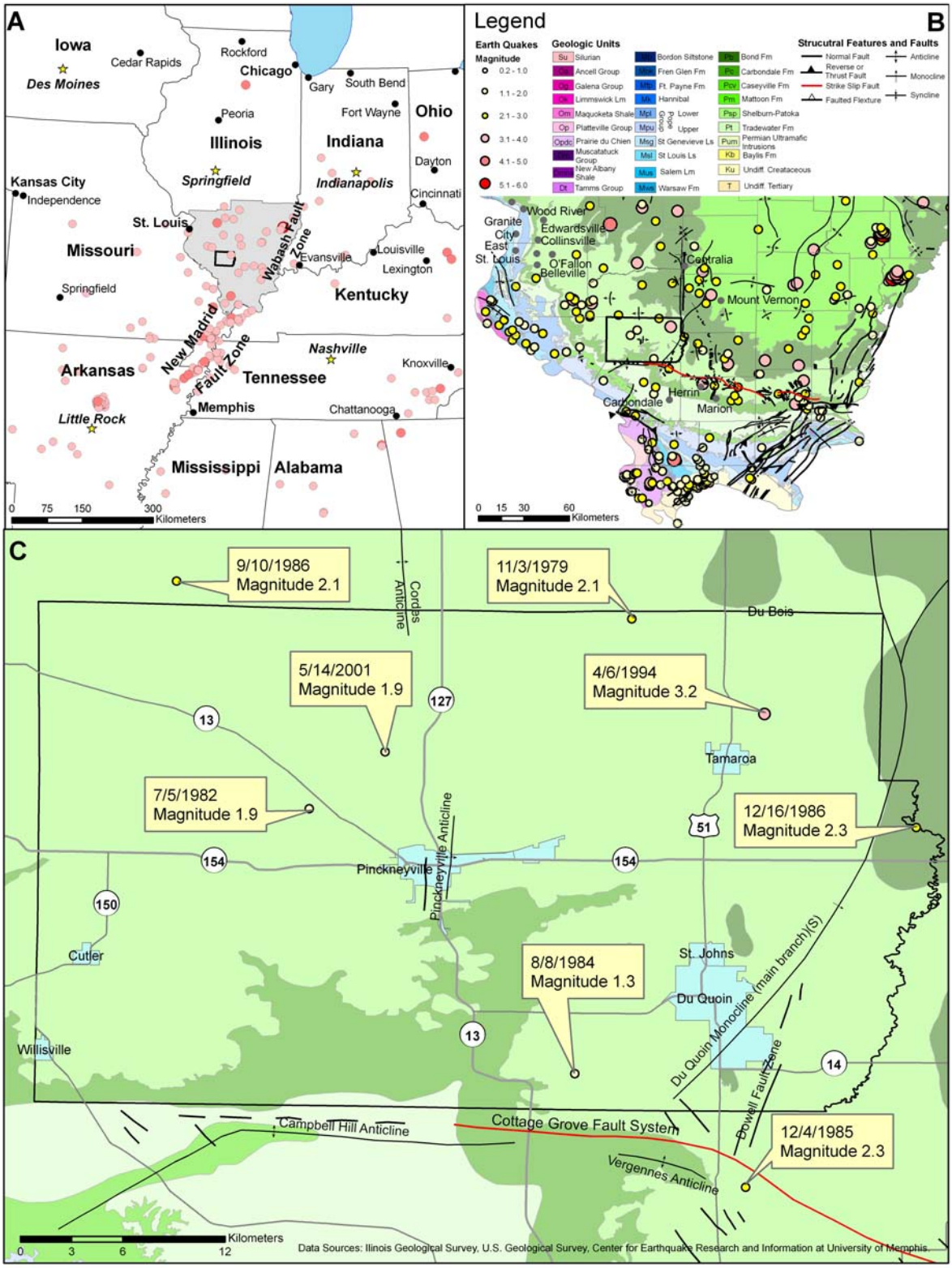
The New Madrid earthquakes are especially noteworthy because the seismic zone is in the center of the North American Plate. Such intraplate earthquakes are felt, and do damage, over much broader areas than comparable earthquakes at plate boundaries. The precise driving force responsible for activity on the New Madrid seismic zone is not known, but most scientists infer that it is compression transmitted across the North American Plate. That compression is focused on New Madrid because it is the site of a Paleozoic structure—the Reelfoot Rift—which is a zone of weakness in the crust.

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*.) Frequent large earthquakes on the New Madrid seismic zone are geologically puzzling because the region shows relatively little deformation. Three explanations have been proposed: 1) recent seismological and geodetic activity is still a short-term response to the 1811–12 earthquakes; 2) activity is irregular or cyclic; or 3) activity began only in the recent geologic past. There is some dispute over how often earthquakes like the 1811–12 sequence occur. Many researchers estimate a recurrence interval of between 550 and 1100 years; other researchers suggest that either the magnitude of the 1811–12 earthquakes have been over-stated, or else the actual frequency of these events is less. It is fair to say, however, that even if the 1811–12 shocks were just magnitude ~7 events, they nonetheless caused widespread damage and would do the same if another such earthquake or earthquake sequence were to strike today.

[Above: New Madrid earthquakes and seismic zone modified from N. Pinter, 1993, Exercises in Active Tectonic history adapted from *Earthquake Information Bulletin*, 4(3), May-June 1972. *http://earthquake.usgs.gov/regional/states/illinois/history.php*]

Figure 4-9 depicts the following: a) Location of notable earthquakes in the Illinois region with inset of Perry County; b) Generalized geologic bedrock map with earthquake epicenters, geologic structures, and inset of Perry County; c) Geologic and earthquake epicenter map of Perry County.

Figure 4-9 a, b, and c: Perry County Earthquakes



The earliest reported earthquake in Illinois was in **1795**. This event was felt at Kaskaskia, IL for a minute and a half and was also felt in Kentucky. At Kaskaskia, subterranean noises were heard. Due to the sparse frontier population, an accurate location is not possible, and the shock may have actually originated outside the state.

An intensity VI-VII earthquake occurred on **April 12, 1883**, awakening several people in Cairo, IL. One old frame house was significantly damaged, resulting in slight injury to the inhabitants. This is the only record of injury in the state due to earthquakes.

On **October 31, 1895** a large M6.8 occurred at Charleston, Missouri, just south of Cairo. Strong shaking caused eruptions of sand and water at many places along a line roughly 30 km (20 mi) long. Damage occurred in six states, but most severely at Charleston, with cracked walls, windows shattered, broken plaster, and chimneys fallen. Shaking was felt in 23 states from Washington, D.C. to Kansas and from southernmost Canada to New Orleans, LA.

A Missouri earthquake on **November 4, 1905**, cracked walls in Cairo. Aftershocks were felt over an area of 100,000 square miles in nine states. In Illinois, it cracked the wall of the new education building in Cairo and a wall at Carbondale, IL.

Among the largest earthquakes occurring in Illinois was the **May 26, 1909** shock, which knocked over many chimneys at Aurora. It was felt over 500,000 square miles and strongly felt in Iowa and Wisconsin. Buildings swayed in Chicago where there was fear that the walls would collapse. Just under two months later, a second Intensity VII earthquake occurred on **July 18, 1909**, damaged chimneys in Petersburg, IL, Hannibal, MO, and Davenport, IA. Over twenty windows were broken, bricks loosened and plaster cracked in the Petersburg area. This event was felt over 40,000 square miles.

On **November 7, 1958**, a shock along the Indiana border resulted in damage at Bartelso, Dale and Maunie, IL. Plaster cracked and fell, and a basement wall and floor were cracked.

On **August 14, 1965**, a sharp but local shock occurred at Tamms, IL, a town of about 600 people. The magnitude 5 quake damaged chimneys, cracked walls, knocked groceries from the shelves, and muddied the water supply. Thunderous earth noises were heard. This earthquake was only felt within a 10 mile radius of Tamms, in communities such as Elco, Unity, Olive Branch, and Olmstead, IL. Six aftershocks were felt.

An earthquake of Intensity VII occurred on **November 9, 1968**. This magnitude 5.3 shock was felt over an area of 580,000 square miles in 23 states. There were reports of people in tall buildings in Ontario and Boston feeling the shock. Damage consisted of bricks being knocked from chimneys, broken windows, toppled television antennae, and cracked plaster. There were scattered reports of cracked foundations, fallen parapets, and overturned tombstones. Chimney damage was limited to buildings 30 to 50 years old. Many people were frightened. Church bells rang at Broughton and several other towns. Loud rumbling earthquake noise was reported in many communities.

Dozens of other shocks originating in Missouri, Arkansas, Kansas, Nebraska, Tennessee, Indiana, Ohio, Michigan, Kentucky, and Canada have been felt in Illinois without causing damage. There have been three earthquakes slightly greater than magnitude 5.0 and Intensity level VII which occurred in 1968, 1987 and 2008 and that were widely felt throughout southern Illinois and the midcontinent.

Above text adapted from *http://earthquake.usgs.gov/regional/states/illinois/history.php* and from *Seismicity of the United States, 1568-1989 (Revised), C.W. Stover and J.L. Coffman, U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington: 1993.*

Geographic Location for Earthquake Hazard

Perry County occupies a region susceptible to earthquakes. Regionally, the two most significant zones of seismic activity are the New Madrid Seismic Zone and the Wabash Valley Fault System.

Hazard Extent for Earthquake Hazard

The extent of the earthquake is countywide.

Calculated Risk Priority Index for Earthquake Hazard

Based on historical information as well as current USGS and SIU research and studies, future earthquakes in Perry County are likely. According to the RPI, earthquake is ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	8	=	16

Vulnerability Analysis for Earthquake Hazard

This hazard could impact the entire jurisdiction equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake and can expect the same impacts within the affected area. 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. damaged police station will no longer be able to serve the community). A complete list of all of the critical facilities, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 shows building exposure for the entire county. The buildings within the county can all expect the same impacts, similar 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 residence to seek shelter).

Infrastructure

During an earthquake, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since a full inventory of 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 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 fail or become impassable causing risk to traffic. Typical scenarios are described to gauge the anticipated impacts of earthquakes in the county in terms of number and types of buildings and infrastructure.

The SIU-Polis team reviewed existing geological information and recommendations for earthquake scenarios. Three earthquake scenarios—two based on USGS modeled scenarios and one based on deterministic scenarios were developed to provide a reasonable basis for earthquake planning in Perry County. The two USGS analyses were a M7.7 event on the New Madrid fault zone and M7.1 earthquake on the Wabash Valley Seismic Zone. Shake maps provided by FEMA were used in HAZUS-MH to estimate losses for Perry County based on these events. The final scenario was a Moment Magnitude of 5.5 with the epicenter located in Perry County. Note that a deterministic scenario, in this context, refers to hazard or risk models based on specific scenarios without explicit consideration of the probability of their occurrences. This scenario was selected based upon a rupture on the Cottage Grove Fault System, a local fault that presents a realistic earthquake scenario for planning purposes.

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

FEMA provided a liquefaction map for Illinois. Low-lying areas in floodplains with a water table within five feet of the surface are particularly susceptible to liquefaction. These areas contain Class F soil types. For this analysis, a depth to water table of five meters was used.

An earthquake depth of 10.0 kilometers was selected based on input from Geophysicist Harvey Henson (SIU). HAZUS-MH also requires the user to define an attenuation function unless ground motion maps are supplied. Because Perry County has experienced smaller earthquakes, the decision was made to use the Toro et al. (1997) attenuation function.

The building losses are subdivided 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

Earthquake Analysis

Results for 7.7 Magnitude Earthquake New Madrid Scenario

The results of the 7.7 New Madrid earthquake are depicted in Table 4-23, Table 4-24, and Figure 4-10. HAZUS estimates that approximately 711 buildings will be at least moderately damaged. This is more than 8% of the total number of buildings in the region. It is estimated that 189 buildings will be damaged beyond repair.

The total building-related losses totaled $64.89 million; 7% 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 comprised more than 67% of the total loss.

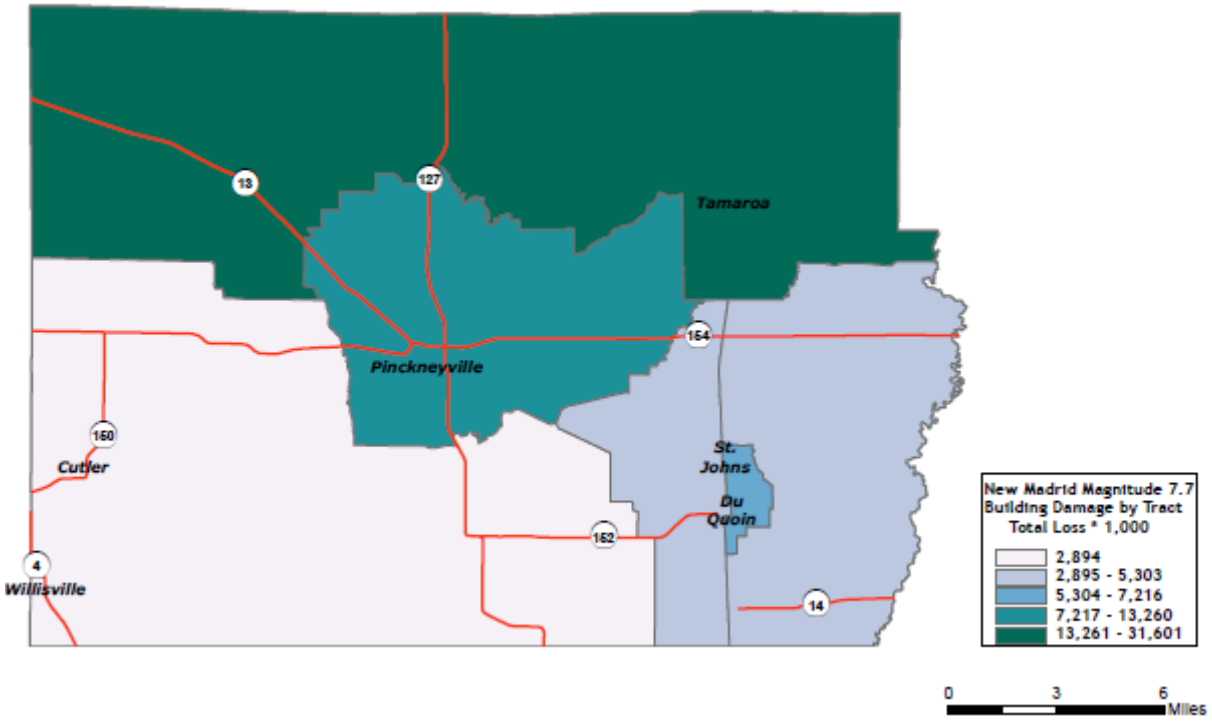
Table 4-23: New Madrid Scenario-Damages Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	6	0.08	3	0.17	1	0.26	0	0.52	0	0.21
Commercial	60	0.90	26	1.64	10	2.07	1	4.07	1	0.56
Education	4	0.07	2	0.11	1	0.13	0	0.16	0	0.07
Government	10	0.15	4	0.24	1	0.26	0	0.31	0	0.07
Industrial	27	0.40	12	0.79	7	1.35	1	2.91	0	0.21
Other Residential	747	11.18	528	33.83	299	59.47	8	41.05	45	23.67
Religion	13	0.19	4	0.28	2	0.34	0	0.59	0	0.07
Single Family	5,819	87.03	983	62.95	182	36.12	9	50.40	143	75.14
Total	**6,685**		**1,561**		**503**		**18**		**190**	

Table 4-24: New Madrid Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.05	1.23	0.11	0.13	1.52
	Capital-Related	0.00	0.02	0.88	0.08	0.04	1.02
	Rental	0.89	0.30	0.56	0.05	0.05	1.85
	Relocation	0.10	0.02	0.04	0.00	0.01	0.17
	Subtotal	**0.99**	**0.39**	**2.70**	**0.24**	**0.23**	**4.56**
Capital Stock Losses							
	Structural	5.24	1.17	1.12	0.51	0.84	8.88
	Non_Structural	21.06	4.99	4.42	2.37	2.17	35.02
	Content	7.94	1.57	2.98	1.79	1.58	15.87
	Inventory	0.00	0.00	0.09	0.38	0.09	0.55
	Subtotal	**34.24**	**7.74**	**8.62**	**5.05**	**4.69**	**60.33**
	Total	**35.23**	**8.13**	**11.32**	**5.29**	**4.92**	**64.89**

Figure 4-10: New Madrid Scenario-Building Economic Losses in Thousands of Dollars



New Madrid Scenario—Essential Facility Losses

Before the earthquake, the region had 380 care beds available for use. On the day of the earthquake, the model estimates that only 19 care beds (5%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 56% of the beds will be back in service. By day 30, 78% will be operational.

Results for 7.1 Magnitude Earthquake Wabash Valley Scenario

The results of the 7.1 Wabash Valley earthquake are depicted in Table 4-25, Table 4-26, and Figure 4-11. HAZUS estimates that approximately 178 buildings will be at least moderately damaged. This is more than 2% of the total number of buildings in the region. It is estimated that 172 buildings will be damaged beyond repair.

The total building related losses totaled $34.15 million; 4% 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 77% of the total loss.

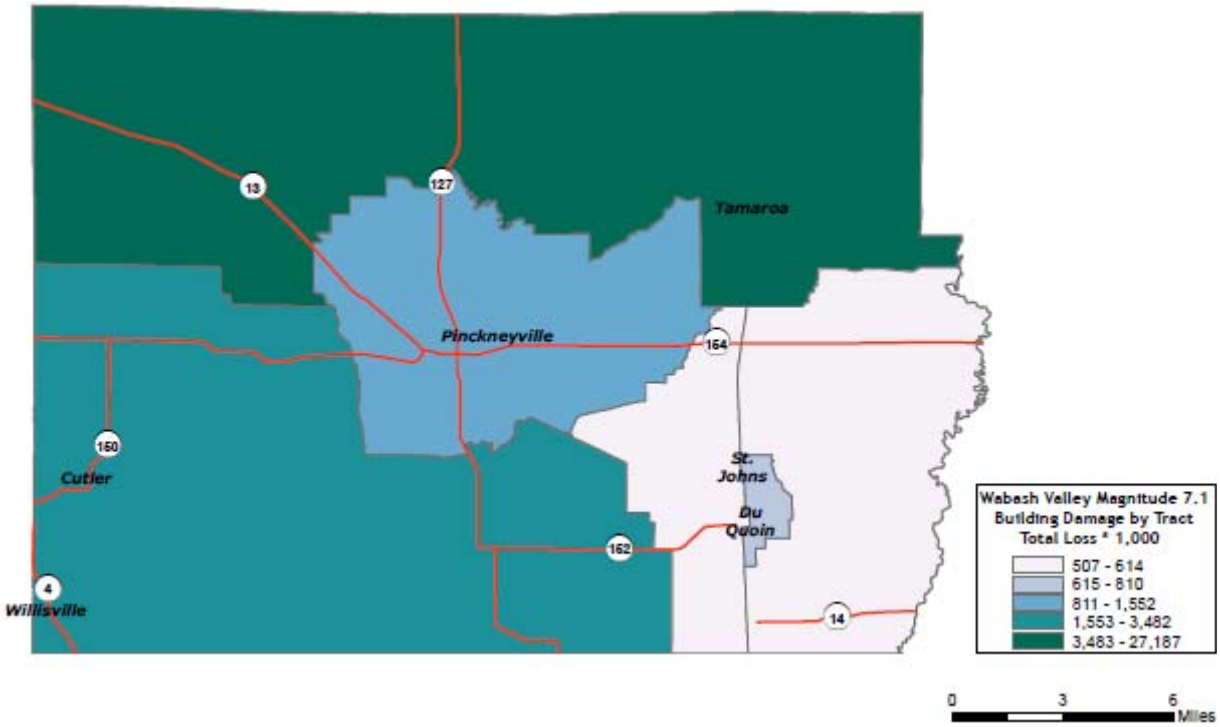
Table 4-25: Wabash Valley Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	10	0.11	0	0.13	0	0.17	0	0.21	0	0.21
Commercial	96	1.10	1	1.14	0	1.35	0	0.56	1	0.56
Education	7	0.08	0	0.12	0	0.14	0	0.07	0	0.07
Government	15	0.17	0	0.20	0	0.24	0	0.07	0	0.07
Industrial	46	0.53	0	0.41	0	0.54	0	0.21	0	0.21
Other Residential	1,545	17.76	39	49.01	2	45.81	0	23.69	41	23.69
Religion	19	0.21	0	0.28	0	0.34	0	0.07	0	0.07
Single Family	6,964	80.04	39	48.72	3	51.41	0	75.12	130	75.12
Total	**8,701**		**79**		**5**		**0**		**173**	

Table 4-26: Wabash Valley Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.03	0.23	0.01	0.02	0.28
	Capital-Related	0.00	0.01	0.17	0.00	0.02	0.21
	Rental	0.63	0.11	0.14	0.00	0.01	0.90
	Relocation	0.07	0.01	0.01	0.00	0.00	0.09
	Subtotal	**0.71**	**0.17**	**0.54**	**0.01**	**0.05**	**1.48**
Capital Stock Loses							
	Structural	3.72	0.46	0.42	0.03	0.38	5.01
	Non_Structural	13.99	2.22	1.88	0.69	1.10	19.87
	Content	4.44	0.68	1.14	0.48	0.82	7.56
	Inventory	0.00	0.00	0.05	0.11	0.07	0.23
	Subtotal	**22.15**	**3.35**	**3.49**	**1.31**	**2.37**	**32.67**
	Total	**22.85**	**3.52**	**4.04**	**1.32**	**2.42**	**34.15**

Figure 4-11: Wabash Valley Scenario-Building Economic Losses in Thousands of Dollars



Wabash Valley Scenario—Essential Facility Losses

Before the earthquake, the region had 380 care beds available for use. On the day of the earthquake, the model estimates that only 178 care beds (47%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 91% of the beds will be back in service. By day 30, 94% will be operational.

Results for 5.5 Magnitude Earthquake in Perry County

The results of the initial analysis, the 5.5 magnitude earthquake with an epicenter in the southeast portion of DuQuoin in Perry County, are depicted in Tables 4-27 and 4-28 and Figure 4-12. HAZUS estimates that approximately 744 buildings will be at least moderately damaged. This is more than 8% of the total number of buildings in the region. It is estimated that 27 buildings will be damaged beyond repair.

The total building related losses totaled $51.59 million; 11% 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 comprised more than 56% of the total loss.

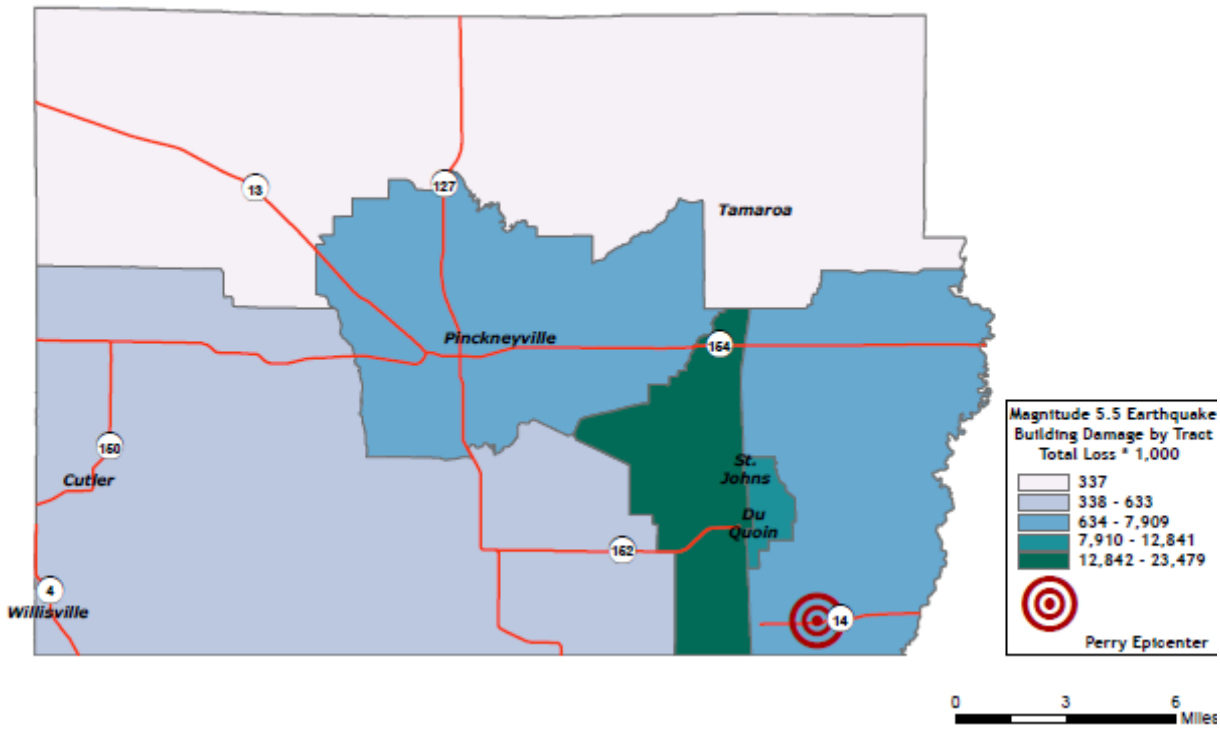
Table 4-27: Perry County 5.5M Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8	0.11	1	0.09	1	0.12	0	0.17	0	0.16
Commercial	67	0.92	15	1.47	12	2.01	4	2.99	1	3.53
Education	5	0.07	1	0.08	1	0.11	0	0.15	0	0.21
Government	12	0.16	2	0.17	1	0.21	0	0.25	0	0.34
Industrial	37	0.51	5	0.53	4	0.64	1	0.74	0	0.49
Other Residential	1,136	15.75	238	23.76	200	34.84	47	33.10	6	21.22
Religion	14	0.19	3	0.25	2	0.33	1	0.50	0	0.66
Single Family	5,934	82.28	737	73.64	355	61.74	88	62.10	21	73.37
Total	**7,212**		**1,001**		**575**		**142**		**28**	

Table 4-28: Perry County 5.5M Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	1.81	0.07	0.19	2.10
	Capital-Related	0.00	0.01	1.32	0.05	0.04	1.43
	Rental	0.59	0.56	0.72	0.03	0.07	1.98
	Relocation	0.07	0.02	0.05	0.00	0.02	0.17
	Subtotal	**0.65**	**0.62**	**3.91**	**0.15**	**0.34**	**5.66**
Capital Stock Losses							
	Structural	2.91	1.05	1.35	0.35	0.72	6.38
	Non_Structural	12.00	5.17	4.82	1.98	2.18	26.14
	Content	5.14	1.51	3.33	1.59	1.40	12.97
	Inventory	0.00	0.00	0.08	0.34	0.02	0.44
	Subtotal	**20.05**	**7.72**	**9.58**	**4.25**	**4.32**	**45.92**
	Total	**20.71**	**8.34**	**13.48**	**4.41**	**4.65**	**51.59**

Figure 4-12: Perry County 5.5M Scenario-Building Economic Losses in Thousands of Dollars



Perry County 5.5M Scenario—Essential Facility Losses

Before the earthquake, the region had 380 care beds available for use. On the day of the earthquake, the model estimates that only 36 care beds (10%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 74% of the beds will be back in service. By day 30, 93% will be operational

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

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

Analysis of Community Development Trends

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

4.4.4 Thunderstorm Hazard

Hazard Definition for Thunderstorm Hazard

Severe thunderstorms are defined as thunderstorms with one or more of the following characteristics: strong winds, large damaging hail, and frequent lightning. Severe thunderstorms most frequently occur in Illinois in the spring and summer months and in the late afternoon or evening, 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 of 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 mph

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 a broader distribution. Hailstones range from pea-sized to baseball-sized, but 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 37 hailstorms in Perry County since 1955. These hailstorms have been attributed with $41,000 in property damage. Hailstorms occur nearly every year in the late spring and early summer months. The most recent significant occurrence was in April 2007 when 1.7- inch hail fell in the region.

Perry County hailstorms are listed in Table 4-29; additional details for NCDC events are included in Appendix D.

Table 4-29: Perry County Hailstorms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Perry	9/24/1961	Hail	0.75 in.	0	0	0	0
Perry	4/19/1964	Hail	1.75 in.	0	0	0	0
Perry	4/7/1986	Hail	0.75 in.	0	0	0	0
Perry	5/8/1988	Hail	0.75 in.	0	0	0	0
Du Quoin	5/18/1995	Hail	1.50 in.	0	0	0	0
Pinckneyville	6/7/1995	Hail	0.75 in.	0	0	0	0
Cutler	4/19/1996	Hail	0.75 in.	0	0	0	0
Pinckneyville	5/2/1996	Hail	1.00 in.	0	0	0	0
Tamaroa	8/15/1996	Hail	0.75 in.	0	0	0	0
Pinckneyville	3/28/1997	Hail	1.75 in.	0	0	10K	0
Du Quoin	3/28/1997	Hail	0.75 in.	0	0	0	0
Cutler	4/13/1998	Hail	0.75 in.	0	0	0	0
Swanwick	4/15/1998	Hail	1.75 in.	0	0	0	0
Willisville	6/12/1998	Hail	0.75 in.	0	0	0	0
Central Portion	4/21/2002	Hail	1.75 in.	0	0	25K	0
Du Quoin	4/24/2002	Hail	0.75 in.	0	0	0	0
Tamaroa	5/9/2003	Hail	1.00 in.	0	0	0	0
Pinckneyville	5/26/2004	Hail	1.00 in.	0	0	0	0
Willisville	5/26/2004	Hail	0.88 in.	0	0	0	0
Du Quoin	4/12/2005	Hail	0.75 in.	0	0	0	0
Cutler	4/22/2005	Hail	0.88 in.	0	0	0	0
Tamaroa	4/22/2005	Hail	0.88 in.	0	0	0	0
Tamaroa	2/16/2006	Hail	1.25 in.	0	0	0	0
Pinckneyville	3/11/2006	Hail	1.00 in.	0	0	0	0
Pinckneyville	3/11/2006	Hail	0.75 in.	0	0	0	0
Du Quoin	4/2/2006	Hail	0.88 in.	0	0	0	0
Pinckneyville	4/7/2006	Hail	1.75 in.	0	0	0	0
Du Quoin	4/7/2006	Hail	1.00 in.	0	0	0	0
Du Quoin	4/7/2006	Hail	1.00 in.	0	0	0	0
Cutler	4/7/2006	Hail	1.00 in.	0	0	0	0
Pinckneyville	4/30/2006	Hail	1.50 in.	0	0	0	0
Du Quoin	5/3/2006	Hail	1.00 in.	0	0	0	0
Cutler	5/24/2006	Hail	1.00 in.	0	0	0	0
Pinckneyville	5/24/2006	Hail	0.88 in.	0	0	0	0
Du Quoin	4/3/2007	Hail	1.75 in.	0	0	0	0
Pinckneyville	4/3/2007	Hail	1.00 in.	0	0	6K	0
Du Quoin	1/29/2008	Hail	0.88 in.	0	0	0	0

Source: NCDC

* 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 two occurrences of significant lightning strikes in Perry County since 1950. On February 27, 1999, lightning struck a house, setting it ablaze. The house and its contents were a total loss.

Perry County lightning strikes are listed in Table 4-30; additional details for NCDC events are included in Appendix D. Lightning occurs in Perry County every year. The following list only represents events that were recorded by the NCDC.

Table 4-30: Perry County Lightning Strikes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Pinckneyville	7/19/1996	Lightning	N/A	0	0	50K	0
Du Quoin	2/27/1999	Lightning	N/A	0	0	50K	0

Source: NCDC

* 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 identified 88 wind storms reported since 1955. These severe storms have been attributed with one injury and more than $0.5 million in property damage in Perry and adjacent counties. As shown in Table 4-31, wind storms have historically occurred year-round with the greatest frequency and damage in April through August.

Table 4-31: Perry County Wind Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Perry	4/23/1955	Tstorm Winds	0 kts.	0	0	0	0
Perry	5/10/1962	Tstorm Winds	0 kts.	0	0	0	0
Perry	8/17/1968	Tstorm Winds	0 kts.	0	0	0	0
Perry	8/29/1973	Tstorm Winds	0 kts.	0	0	0	0
Perry	3/29/1974	Tstorm Winds	0 kts.	0	0	0	0
Perry	3/29/1974	Tstorm Winds	0 kts.	0	0	0	0
Perry	6/9/1974	Tstorm Winds	0 kts.	0	0	0	0
Perry	4/18/1975	Tstorm Winds	0 kts.	0	0	0	0
Perry	3/28/1977	Tstorm Winds	0 kts.	0	0	0	0
Perry	8/1/1980	Tstorm Winds	0 kts.	0	0	0	0
Perry	8/2/1980	Tstorm Winds	0 kts.	0	0	0	0
Perry	4/4/1981	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/20/1981	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/20/1981	Tstorm Winds	52 kts.	0	0	0	0
Perry	4/2/1982	Tstorm Winds	0 kts.	0	0	0	0
Perry	5/29/1982	Tstorm Winds	0 kts.	0	0	0	0
Perry	5/31/1982	Tstorm Winds	0 kts.	0	0	0	0
Perry	3/15/1984	Tstorm Winds	0 kts.	0	0	0	0
Perry	3/15/1984	Tstorm Winds	0 kts.	0	0	0	0
Perry	4/29/1984	Tstorm Winds	0 kts.	0	0	0	0
Perry	6/26/1984	Tstorm Winds	52 kts.	0	0	0	0
Perry	7/26/1984	Tstorm Winds	52 kts.	0	0	0	0
Perry	7/9/1986	Tstorm Winds	70 kts.	0	0	0	0
Perry	6/8/1988	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/5/1990	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/2/1991	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/5/1991	Tstorm Winds	0 kts.	0	0	0	0
Perry	11/29/1991	Tstorm Winds	0 kts.	0	0	0	0
Perry	11/29/1991	Tstorm Winds	0 kts.	0	0	0	0
Perry	6/23/1992	Tstorm Winds	0 kts.	0	0	0	0
Perry	6/23/1992	Tstorm Winds	0 kts.	0	0	0	0
Perry	7/14/1992	Tstorm Winds	0 kts.	0	0	0	0
Perry	9/9/1992	Tstorm Winds	0 kts.	0	0	0	0
Tamaroa	4/15/1994	Tstorm Winds	N/A	0	0	50K	0
Du Quoin	5/18/1995	Tstorm Winds	N/A	0	0	1K	0
Perry	11/11/1995	High Winds	0 kts.	0	0	0	0
Pinckneyville	7/19/1996	Tstorm Winds	0 kts.	0	0	10K	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Pinckneyville	9/6/1996	Tstorm Winds	0 kts.	0	0	15K	0
Perry	10/22/1996	High Wind	0 kts.	0	0	28K	0
Cutler	12/23/1996	Tstorm Winds	50 kts.	0	0	2K	0
Perry	4/30/1997	High Wind	52 kts.	0	0	20K	0
Du Quoin	5/21/1998	Tstorm Winds	50 kts.	0	0	0	0
Perry	11/10/1998	High Wind	50 kts.	0	0	20K	0
Perry	2/7/1999	Strong Winds	N/A	0	0	23K	0
Conant	2/27/1999	Tstorm Winds	0 kts.	0	0	40K	0
Tamaroa	6/4/1999	Tstorm Winds	50 kts.	0	0	5K	0
Tamaroa	4/16/2000	Tstorm Winds	0 kts.	0	0	1K	0
Perry	4/20/2000	Wind	N/A	0	0	0	0
Rice	8/17/2000	Tstorm Winds	0 kts.	0	0	15K	0
Willisville	6/5/2001	Tstorm Winds	52 kts.	0	0	0	0
Perry	7/18/2001	Tstorm Winds	50 kts.	0	0	10K	0
Du Quoin	8/18/2001	Tstorm Winds	50 kts.	0	0	10K	0
Pinckneyville	8/25/2001	Tstorm Winds	50 kts.	0	0	0	0
Willisville	10/24/2001	Tstorm Winds	50 kts.	0	0	0	0
Perry	3/9/2002	Wind	N/A	0	0	3K	0
Tamaroa	4/27/2002	Tstorm Winds	50 kts.	0	0	3K	0
Du Quoin	5/12/2002	Tstorm Winds	52 kts.	0	0	5K	0
Pinckneyville	6/10/2003	Tstorm Winds	60 kts.	0	1	0	0
Tamaroa	6/11/2003	Tstorm Winds	50 kts.	0	0	0	0
Pinckneyville	9/26/2003	Heavy Rain	N/A	0	0	0	0
Tamaroa	5/25/2004	Tstorm Winds	50 kts.	0	0	3K	0
Pinckneyville	5/27/2004	Tstorm Winds	52 kts.	0	0	4K	0
Perry	5/30/2004	Tstorm Winds	50 kts.	0	0	0	0
Pinckneyville	6/18/2004	Tstorm Winds	52 kts.	0	0	4K	0
Du Quoin	7/5/2004	Tstorm Winds	50 kts.	0	0	30K	0
Du Quoin	8/28/2004	Tstorm Winds	50 kts.	0	0	0	0
Pinckneyville	10/26/2004	Heavy Rain	N/A	0	0	0	0
Du Quoin	11/1/2004	Heavy Rain	N/A	0	0	0	0
Pinckneyville	1/5/2005	Heavy Rain	N/A	0	0	0	0
Du Quoin	5/19/2005	Heavy Rain	N/A	0	0	0	0
Pinckneyville	6/8/2005	Tstorm Winds	50 kts.	0	0	2K	0
Perry	1/8/2006	Strong Wind	N/A	0	0	19K	0
Perry	1/19/2006	Strong Wind	N/A	0	0	19K	0
Perry	2/16/2006	Strong Wind	N/A	0	0	14K	0
Pinckneyville	2/16/2006	Tstorm Winds	50 kts.	0	0	0	0
Du Quoin	4/2/2006	Tstorm Winds	56 kts.	0	0	50K	0
Du Quoin	4/30/2006	Tstorm Winds	50 kts.	0	0	4K	0
Du Quoin	5/2/2006	Heavy Rain	N/A	0	0	0	0
Perry	6/1/2006	Heavy Rain	N/A	0	0	0	0
Pinckneyville	6/17/2006	Tstorm Winds	56 kts.	0	0	75K	0
Du Quoin	7/21/2006	Tstorm Winds	50 kts.	0	0	7K	0
Du Quoin	3/22/2007	Heavy Rain	N/A	0	0	0	0
Pinckneyville	4/3/2007	Heavy Rain	N/A	0	0	0	0
Du Quoin	5/10/2007	Heavy Rain	N/A	0	0	0	0
Sunfield	10/18/2007	Tstorm Wind	N/A	0	0	4K	0
Du Quoin	1/29/2008	Tstorm Wind	N/A	0	0	20K	0
Du Quoin	2/5/2008	Tstorm Wind	N/A	0	0	2K	0
Clinch	2/5/2008	Tstorm Wind	N/A	0	0	10K	0

Source: NCDC

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

Geographic Location for 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 listed previously varies in terms of the extent of the storm, the wind speed, and the size of hailstones. Thunderstorms can occur at any location within the county.

Calculated Risk Priority Index for Thunderstorm Hazard

Based on historical information, the probability of future high wind damage 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 three hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	2	=	8

Vulnerability Analysis for Thunderstorm Hazard

Severe thunderstorms are an evenly distributed threat across the entire jurisdiction; therefore, the entire county's population and all buildings are susceptible to severe thunderstorms and can expect the same impacts. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Perry County are discussed in types and numbers in Table 4-8.

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, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-7 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-8. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, 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 residence 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 equally vulnerable, it is important to emphasize that any number of these items could become damaged during a severe thunderstorm. 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 fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

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

Analysis of 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 preventing the loss of property and ensuring the safety of Perry County residents.

4.4.5 Winter Storm Hazard

Hazard Definition for Winter Storm Hazard

Severe winter weather consists of various forms of precipitation and strong weather conditions. This may include one or more of the following conditions: 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, and death.

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 frozen raindrops that bounce when they hit the ground or other objects. 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.

The most damaging winter storms in southern Illinois have been ice storms. Ice storms occur when moisture-laden gulf air converges with the northern jet stream causing strong winds and heavy precipitation. This precipitation takes the form of freezing rain coating power and communication lines and trees with heavy ice. The winds will then cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication. In the past few decades, including the winter of 2007–08, numerous ice storm events have occurred in southern Illinois.

Snow Storms

Significant snow storms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. A blizzard is categorized as a snow storm with winds of 35 miles per hour or greater and/or visibility of less than ¼ mile for three or more hours. Blizzards are the most dramatic and perilous of all winter storm events. Most snow within a blizzard is in the form of fine, powdery particles, which are wind-blown in such great quantities that visibility is reduced to only a few feet. Blizzards have the potential to result in property damage.

Illinois has repeatedly been struck by blizzards, although they are less common in the southern part of the state. Blizzard conditions can cause power outages, loss of communication, and make transportation impossible. The blowing of snow can reduce visibility to less than ¼ mile, resulting in disorientation that can make even travel by foot dangerous.

Severe Cold

Severe cold is characterized by the ambient air temperature that may drop to 0°F or below. These extreme temperatures can increase the likelihood of frostbite and hyperthermia. 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), which can lower the time it takes for frostbite and hypothermia to affect a person's body.

Previous Occurrences for Winter Storm Hazard

The NCDC database identified 69 winter storm and extreme cold events for Perry County since 1994. Winter Storms in Perry and adjacent Counties have been attributed with 3 deaths, 4 injuries, and $1.75 million in property damage. On February 21, 2008, low pressure organized over Louisiana, spreading precipitation northeast along a warm front that extended into the Ohio Valley. Arctic high pressure over the Great Lakes region produced a cold northeast wind flow in the low levels. This low-level cold air was responsible for sleet and freezing rain.

Although this was the second ice storm in only ten days, ice accumulations were less serious than the crippling ice storm on February 11. One-quarter to one-half inch of ice accumulated south and east of Marion. From the Marion/Carbondale area north and west, up to 2.5 inches of sleet fell. Freezing rain coated surfaces with less than a quarter inch of ice. Many schools and businesses were closed for this second round of ice.

The NCDC winter storms for Perry County are listed in Table 4-32. Additional details for NCDC events are included in Appendix D.

Table 4-32: Winter Storm Events*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Southern Illinois	3/8/1994	Heavy Snow	N/A	0	0	500K	0
Perry	12/8/1995	Snow	N/A	0	0	0	0
Perry	12/9/1995	Cold Wave	N/A	0	0	0	0
Perry	1/2/1996	Winter Storm	N/A	0	0	0	0
Perry	1/6/1996	Winter Storm	N/A	0	0	0	0
Perry	2/2/1996	Extreme Cold	N/A	0	0	0	0
Perry	12/16/1996	Winter Storm	N/A	0	0	0	0
Perry	1/8/1997	Winter Storm	N/A	0	0	0	0
Perry	1/10/1997	Extreme Windchill	N/A	1	0	0	0
Perry	1/15/1997	Ice Storm	N/A	0	0	0	0
Perry	4/10/1997	Heavy Snow	N/A	0	0	0	0
Perry	4/18/1997	Frost	N/A	0	0	0	0
Perry	12/8/1997	Snow	N/A	0	0	0	0
Perry	12/30/1997	Snow	N/A	0	0	0	0
Perry	1/17/1998	Freezing Drizzle	N/A	0	0	0	0
Perry	1/22/1998	Snow	N/A	0	0	0	0
Perry	12/21/1998	Freezing Rain	N/A	0	0	0	0
Perry	1/1/1999	Ice Storm	N/A	0	0	150K	0
Perry	3/14/1999	Heavy Snow	N/A	0	0	0	0
Perry	1/22/2000	Snow	N/A	0	0	0	0
Perry	3/11/2000	Heavy Snow	N/A	0	0	0	0
Perry	4/9/2000	Frost	N/A	0	0	0	0
Perry	10/9/2000	Frost	N/A	0	0	0	0
Perry	12/12/2000	Extreme Cold	N/A	0	0	0	0
Perry	12/13/2000	Winter Storm	N/A	0	0	0	0
Perry	12/15/2000	Freezing Rain	N/A	0	0	0	0
Perry	1/1/2001	Extreme Cold	N/A	0	0	0	0
Perry	1/26/2001	Freezing Rain	N/A	0	0	0	0
Perry	4/18/2001	Frost	N/A	0	0	0	0
Perry	2/25/2002	Snow	N/A	0	0	0	0
Pinckneyville	4/21/2002	Funnel Cloud	N/A	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Perry	12/4/2002	Winter Storm	N/A	0	0	0	0
Perry	12/23/2002	Winter Storm	N/A	0	0	0	0
Perry	1/22/2003	Winter Weather/mix	N/A	0	0	0	0
Perry	1/23/2003	Extreme Cold/wind Chill	N/A	0	0	0	0
Perry	2/16/2003	Winter Storm	N/A	0	0	0	0
Perry	2/23/2003	Heavy Snow	N/A	0	0	0	0
Perry	10/3/2003	Frost/freeze	N/A	0	0	0	0
Perry	1/25/2004	Ice Storm	N/A	0	0	0	0
Perry	1/27/2004	Winter Weather/mix	N/A	0	0	0	0
Perry	1/29/2004	Winter Weather/mix	N/A	0	0	0	0
Perry	2/5/2004	Heavy Snow	N/A	0	0	0	0
Perry	12/22/2004	Winter Storm	N/A	1	1	100K	0
Perry	12/23/2004	Extreme Cold/wind Chill	N/A	1	0	0	0
Perry	2/23/2005	Winter Weather/mix	N/A	0	0	0	0
Perry	5/4/2005	Frost/freeze	N/A	0	0	0	0
Perry	10/28/2005	Frost/freeze	N/A	0	0	0	0
Perry	12/8/2005	Winter Weather/mix	N/A	0	0	0	0
Perry	2/8/2006	Winter Weather/mix	N/A	0	0	0	0
Perry	2/18/2006	Winter Weather/mix	N/A	0	0	0	0
Perry	10/13/2006	Frost/freeze	N/A	0	0	0	0
Perry	1/20/2007	Winter Weather	N/A	0	0	0	0
Perry	2/1/2007	Winter Weather	N/A	0	0	0	0
Perry	2/13/2007	Winter Weather	N/A	0	0	0	0
Perry	2/17/2007	Winter Weather	N/A	0	0	0	0
Perry	4/5/2007	Frost/freeze	N/A	0	0	0	0
Perry	4/6/2007	Frost/freeze	N/A	0	0	0	0
Perry	4/7/2007	Frost/freeze	N/A	0	0	0	0
Perry	4/8/2007	Frost/freeze	N/A	0	0	0	3.0M
Perry	4/9/2007	Frost/freeze	N/A	0	0	0	0
Perry	10/29/2007	Frost/freeze	N/A	0	0	0	0
Perry	11/7/2007	Frost/freeze	N/A	0	0	0	0
Perry	12/15/2007	Winter Weather	N/A	0	0	0	0
Perry	12/15/2007	Winter Weather	N/A	0	0	0	0
Perry	1/31/2008	Winter Storm	N/A	0	0	0	0
Perry	2/1/2008	Winter Storm	N/A	0	1	0	0
Perry	2/1/2008	Winter Weather	N/A	0	2	0	0
Perry	2/11/2008	Winter Storm	N/A	0	0	1.0M	0
Perry	2/21/2008	Winter Storm	N/A	0	0	0	0

Source: NCDC

* 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 Winter Storm Hazard

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

Hazard Extent for Winter Storm Hazard

The extent of the historical winter storms listed previously varies in terms of storm extent, temperature, and ice or snowfall. Severe winter storms affect the entire jurisdiction equally.

Calculated Risk Priority Index for Winter Storm Hazard

Based on historical information, the probability of future winter storms is likely. Winter storms of varying magnitudes are expected to happen. According to the RPI, winter storms ranked as the number six highest hazard.

RPI = Probability x Magnitude/Severity.

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

Vulnerability Analysis for Winter Storm Hazard

Winter storm impacts are evenly distributed across the jurisdiction; therefore the entire county is vulnerable to winter storms and can expect the same impacts within the affected area. The building exposure for Perry County, as determined from the building inventory, is included in Table 4-8.

Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as any other buildings within the jurisdiction. These impacts include loss of gas or electricity from broken or damaged utility lines, roads and railways damaged or impassable, broken water pipes, and roof collapse from heavy snow. Table 4-7 lists the types and numbers of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 lists the building exposure in terms of types and numbers of buildings for the entire county. The impacts to the building stock within the county are similar to the damages expected to the critical facilities, including loss of gas of electricity from broken or damaged utility lines, roads and railways damaged or impassable, 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 equally vulnerable, it is important to emphasize that any number of these items could become damaged during 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.

Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

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

Analysis of Community Development Trends

Because the winter storm events are regional in nature, future development will be impacted across the county.

4.4.6 Hazardous Materials Storage and Transport Hazard

Hazard Definition for Hazardous Materials Storage and Transport Hazard

Explosions result from the ignition of volatile materials such as petroleum products, natural gas and other flammable gases, hazardous materials/chemicals and dust, and explosive devices. 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 for Hazardous Materials Storage and Transport Hazard

Perry County has not experienced a significant or large-scale hazardous material incident at a fixed site or transportation route that has resulted in multiple deaths or serious injuries. However, On February 9, 2003, a Canadian National Railway/Illinois Central Railroad Company (CNIC) northbound train derailed in Tamaroa. Several of the derailed cars contained vinyl chloride, hydrochloric acid, methanol, or formaldehyde. Damage to some of the cars allowed chemicals to be released into the surrounding environment. Some of the cars also caught fire. In response, residents within a three-mile radius of the derailment were evacuated.

Geographic Location for Hazardous Materials Storage and Transport Hazard

The hazardous material hazards are countywide and are primarily associated with the transport of materials via highway or rail.

Hazard Extent for Hazardous Materials Storage and Transport 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.

Calculated Risk Priority Index for Hazardous Materials Storage and Transport Hazard

The possibility of a hazardous materials accident is likely, based on input from the planning team. According to the RPI, Hazardous Materials Storage and Transport ranked as the number seven greatest hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	8	=	24

Vulnerability Analysis for Hazardous Materials Storage and Transport Hazard

Hazardous material impacts are evenly distributed across the jurisdiction; therefore the entire county is vulnerable to a release associated with hazardous materials storage or transport and can expect the same impacts within the affected area. The building exposure for Perry County, as determined from building inventory, is included in Table 4-8. 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, if vulnerable, will encounter many of the same impacts as other buildings 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 4-7 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 lists the building exposure in terms of type and number of buildings for the entire county. The buildings within the county can all expect the same 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).

Infrastructure

During a hazardous materials release, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since a full inventory of 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 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 fail or become impassable causing risk to traffic.

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. The ALOHA model was utilized to assess the area of impact for a vinyl chloride release at the rail track intersection in Du Quoin. Rail and truck tankers commonly haul vinyl chloride to and from facilities.

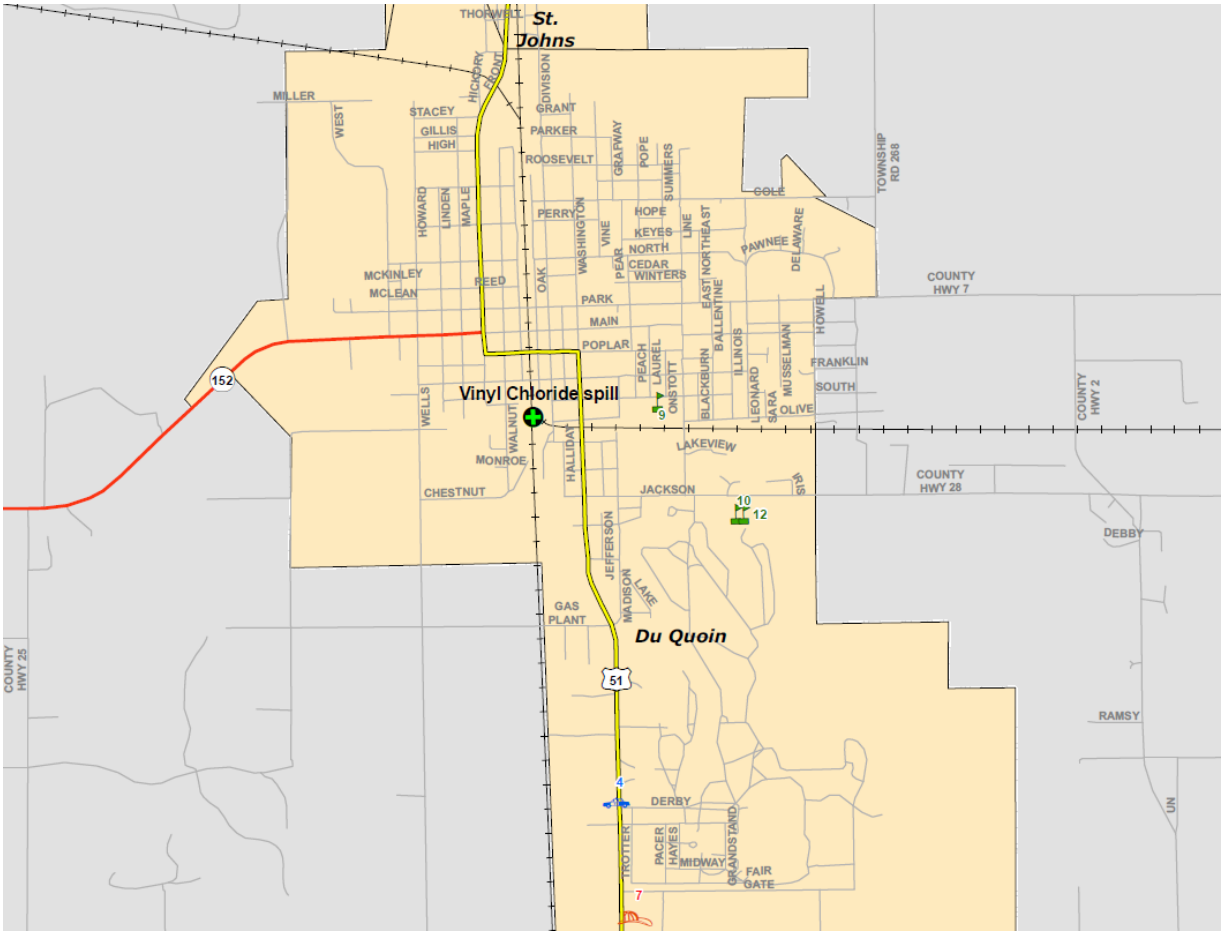
Vinyl chloride is a colorless gas with a sweet odor used to make plastics, adhesives, and other chemicals. Because it is easily ignited, it is shipped as a liquefied gas under its own vapor pressure. Leaks may be liquid or vapor—vapor is heavier than liquid: skin contact with the unconfined liquid may cause frostbite by evaporative cooling, and the displacement of air may

cause asphyxiation. Under prolonged exposure to fire or intense heat, the containers may rupture violently and rocket. Vinyl chloride is a suspected carcinogen. (NOAA Reactivity 2007)

Source: http://cameochemicals.noaa.gov/chemical/1692

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the north-northwest were assumed. The target area was chosen due to its proximity to U.S. Route 51, which sees significant traffic, and the City of Du Quion—Perry County's most populated city. The geographic area covered in this analysis is depicted in Figure 4-13.

Figure 4-13: Location of Chemical Release



Analysis

The ALOHA atmospheric modeling parameters, depicted in Figure 4-14, were based upon a north-northwesterly wind speed of five miles per hour The temperature was 68°F with 75% humidity and partly cloudy skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 12 feet and the length set to 40 feet with 33,500 gallons of vinyl chloride. At the time

of its release, it was estimated that the tank was 99% full. The vinyl chloride in this tank is in its liquid state.

This release was based on a leak from a 2.5 inch-diameter hole, at the bottom of the tank.

Figure 4-14: ALOHA Plume Modeling Parameters

```
SITE DATA:
  Location: DUQUOIN, ILLINOIS
  Building Air Exchanges Per Hour: 0.29 (sheltered single storied)
  Time: November 14, 2008  0949 hours CST (user specified)

CHEMICAL DATA:
  Chemical Name: VINYL CHLORIDE          Molecular Weight: 62.50 g/mol
  TEEL-1: 50 ppm     TEEL-2: 5000 ppm    TEEL-3: 20000 ppm
  LEL: 36000 ppm     UEL: 330000 ppm
  Ambient Boiling Point: 6.0° 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 meters
  Ground Roughness: open country         Cloud Cover: 5 tenths
  Air Temperature: 68° F                 Stability Class: C
  No Inversion Height                    Relative Humidity: 75%

SOURCE STRENGTH:
  Leak from hole in horizontal cylindrical tank
  Flammable chemical escaping from tank (not burning)
  Tank Diameter: 12 feet                 Tank Length: 40 feet
  Tank Volume: 33,841 gallons
  Tank contains liquid                   Internal Temperature: 68° F
  Chemical Mass in Tank: 127 tons        Tank is 99% full
  Circular Opening Diameter: 2.5 inches
  Opening is 12 inches from tank bottom
  Release Duration: 54 minutes
  Max Average Sustained Release Rate: 5,570 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 252,306 pounds
  Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).
```

TEELs (Temporary Emergency Exposure Limits) are derived using existing LOCs (Levels of Concerns) and by manipulating current data. This process is less intensive than the AEGL or ERPG process, and TEELs have been defined for more than 3,000 chemicals.

TEELs are used to help protect the public when AEGLs or ERPGs are not available and there has been a chemical release that is short-term in duration.

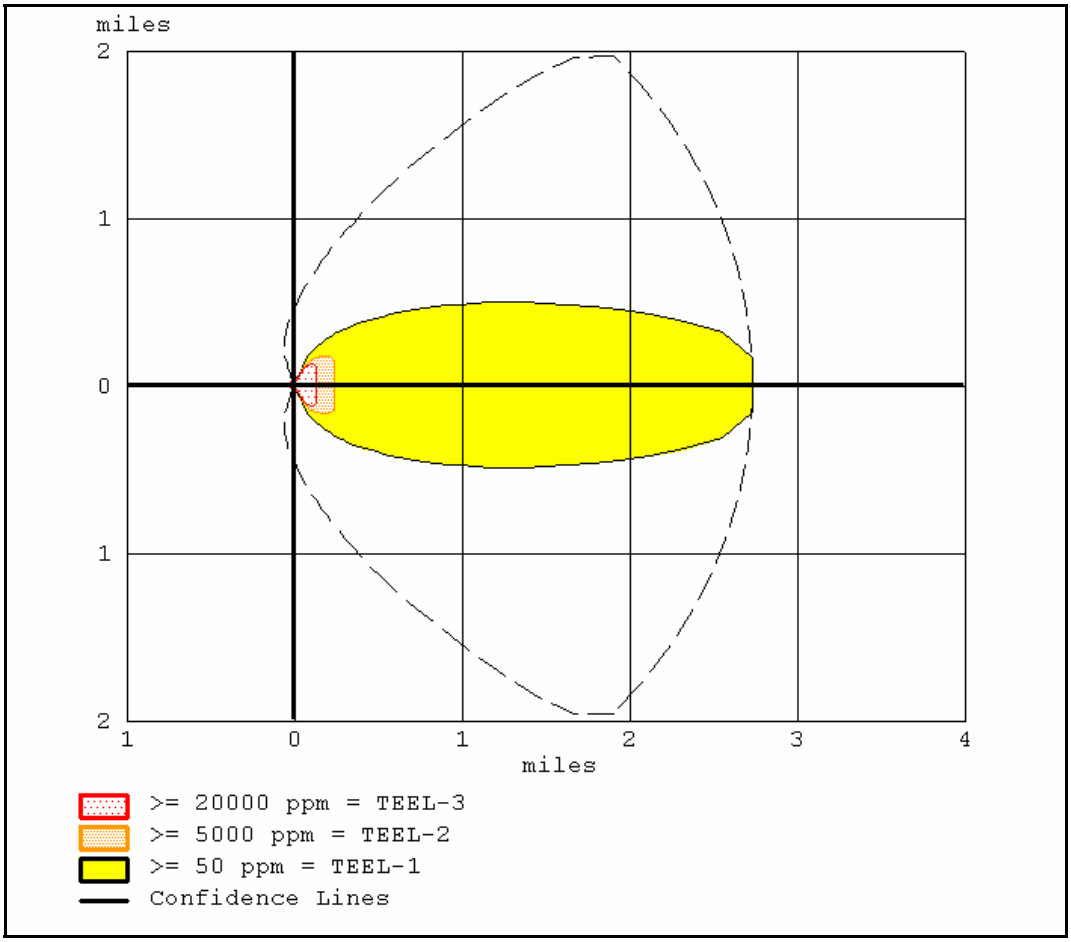
TEELs estimate how the majority of people (except for sensitive individuals) would react to a release of this nature; TEELs could then be used to identify areas where a release of the toxic gas concentration would qualify as hazardous. For example, in areas with concentrations above the TEEL-1, most people would detect the chemical and may experience temporary, mild effects. On the other hand, in areas with concentrations above the TEEL-2, most people would experience significant, though not life-threatening, health effects.

TEELs are derived by the U.S. Department of Energy Subcommittee on Consequence Assessment and Protective Actions (SCAPA) according to a specific, standard methodology. The TEEL methodology determines the TEELs by using available levels of concern and manipulating current data using a peer-reviewed, approved procedure.

TEELs can be derived relatively quickly for almost any chemical, and as a result, are available for thousands of chemicals. TEELs can provide a useful reference when no other public exposure guidelines are available.

According to the ALOHA parameters, approximately 2,000 gallons of material would be released per minute. The image in Figure 4-15 depicts the plume footprint generated by ALOHA.

Figure 4-15: Plume Footprint Generated by ALOHA

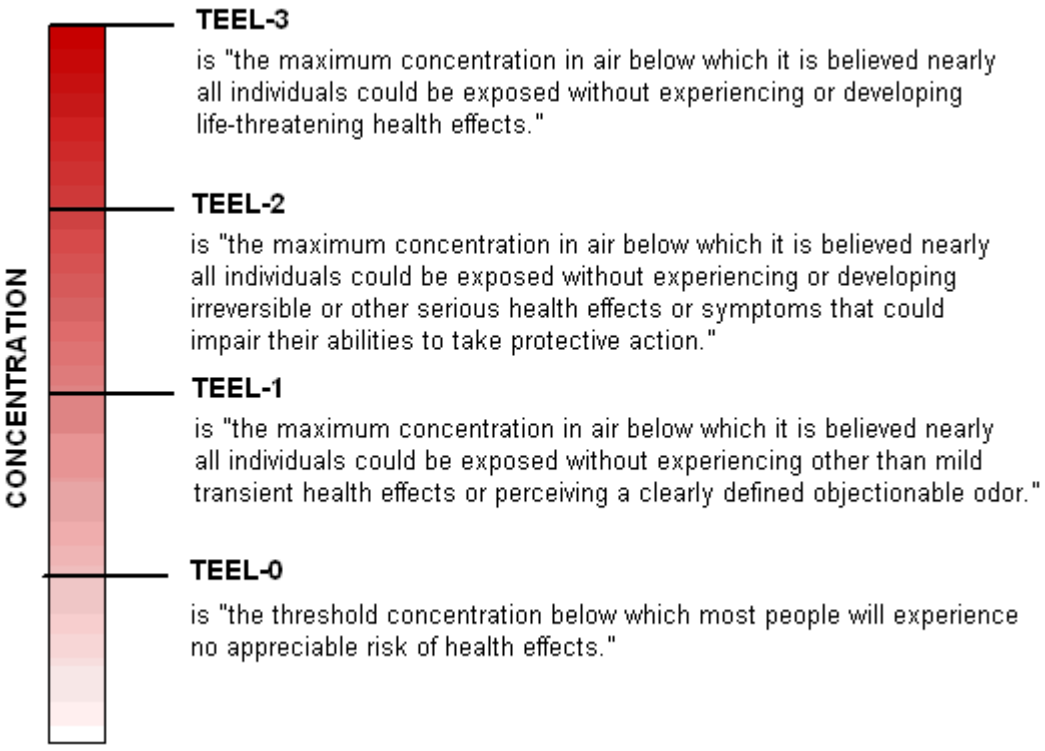


As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). For the purpose of clarification, this report will designate each level of concentration as a specific zone. The zones are as follows:

- **Zone 1** (TEEL-3): The red buffer (>=20,000 ppm) extends no more than 0.2 miles from the point of release after one hour.
- **Zone 2** (TEEL-2): The orange buffer (>=5000 ppm) extends no more than 0.5 miles from the point of release after one hour.
- **Zone 3** (TEEL-1): The yellow buffer (>=50 ppm) extends more than 3 miles from the point of release after one hour.
- **Zone 4** (Confidence Lines): The dashed lines depict the level of confidence in which the exposure zones will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

TEELs estimate the concentrations at which most people will begin to experience health effects if they are exposed to a toxic chemical for a given duration. (Sensitive members of the public, such as old, sick, or very young people, are not covered by these guidelines; they may experience adverse effects at concentrations below the TEEL values.) TEELs are used in similar situations as the 60-minute AEGLs and ERPGs. Each TEEL includes four tiers, defined in Figure 4-16.

Figure 4-16: TEEL Concentration Tiers



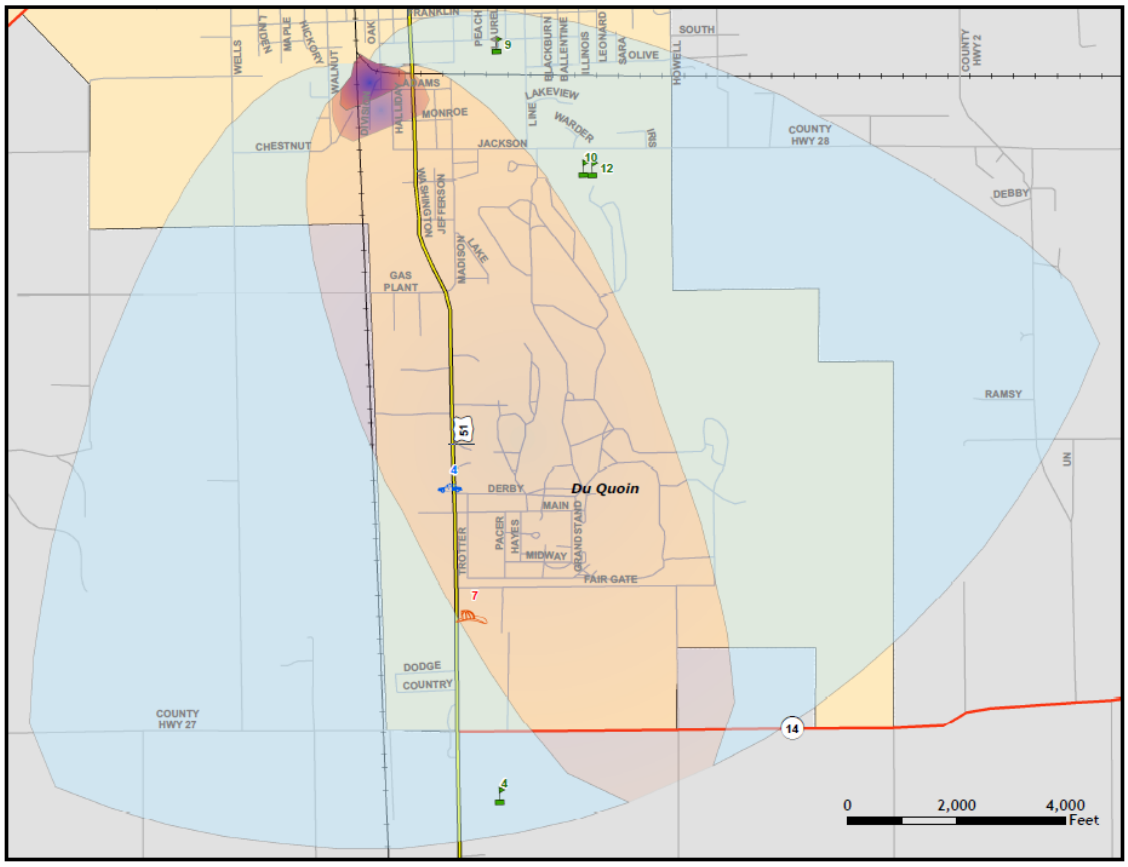
TEEL-0 tier is essentially a no-effects threshold. It is often ignored for emergency response and planning purposes. ALOHA treats TEELs as a three-tiered guideline (TEEL-1, TEEL-2, and

TEEL-3), which can be compared in a general way to the AEGL and ERPG tiers. ALOHA does not include TEEL-0 values.

Source:
http://response.restoration.noaa.gov/topic_subtopic_entry.php?RECORD_KEY%28entry_subtopic_topic%29=entry_id,subtopic_id,topic_id&entry_id(entry_subtopic_topic)=664&subtopic_id(entry_subtopic_topic)=24&topic_id(entry_subtopic_topic)=1

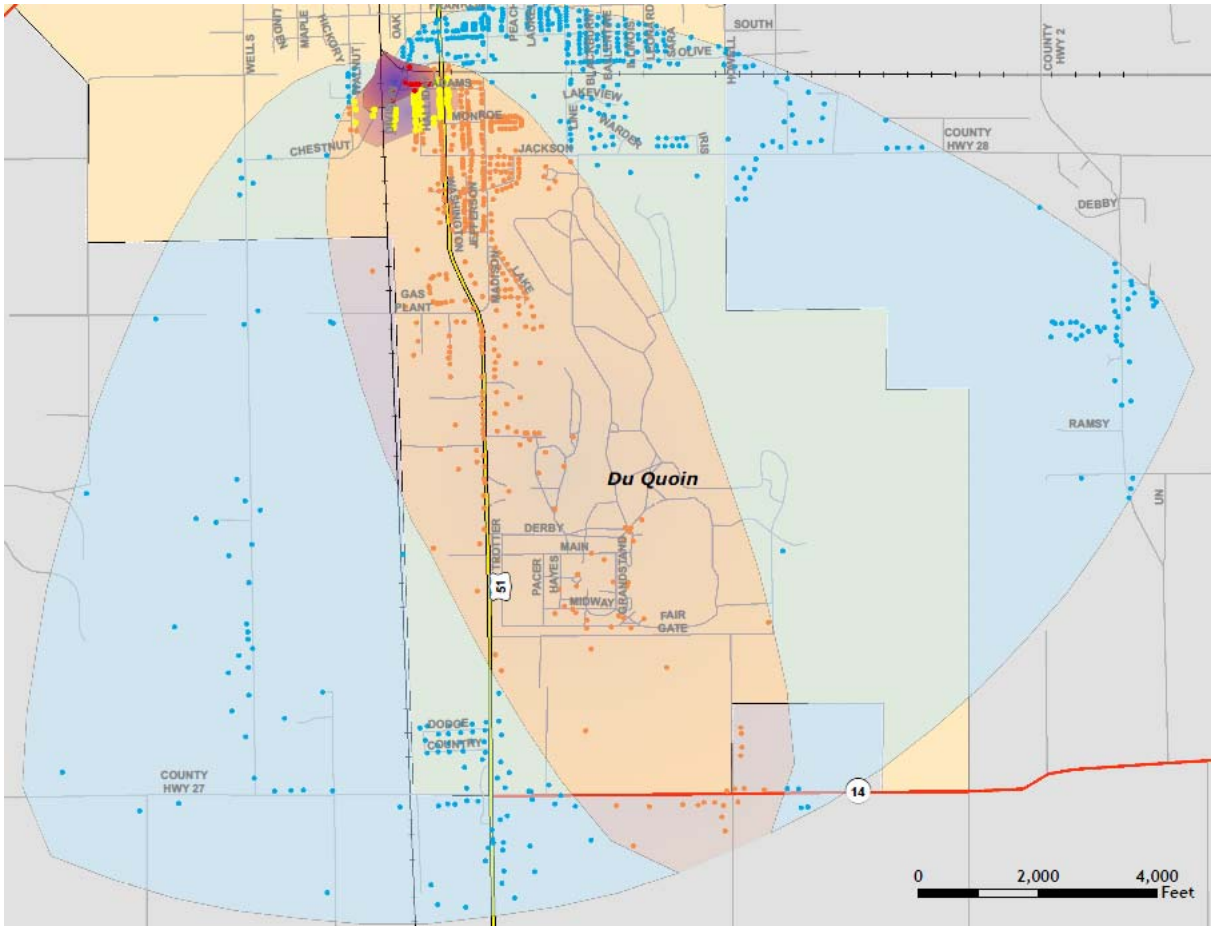
The image in Figure 4-17 depicts the plume footprint generated by ALOHA.

Figure 4-17: ALOHA Plume Footprint Overlaid in ArcGIS



The Perry County structure layer was added to ArcMap and overlaid with the plume footprint. The structure layer was then intersected with each of the four footprint areas to classify each point based upon the plume footprint in which it is located. Figure 4-18 depicts the Perry County structures after the intersect process.

Figure 4-18: Perry County Building Inventory Classified By Plume Footprint



Results

By summing the building inventory within all TEELs zones (Zone 1: 20,000 ppm, Zone 2: 5,000 ppm, Zone 3: 50 ppm, and Zone 4: 95% confidence lines), the GIS overlay analysis predicts that as many as 987 buildings could be exposed at a replacement cost of 18,8632 If this event were to occur, approximately 2,468 people would be affected.

Building Inventory Damage

The results of the analysis against known structure locations are depicted in Table 4-33. Table 4-34 includes the results of the analysis against the default HAZUS-MH General Building Stock.

Table 4-33: Number of Buildings Exposed

	Zone 1	Zone 2	Zone 3	Zone 4
Total	449	57	13	468

Table 4-34: Estimated Building Exposure Occupancy Type (X 1000)

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$ 44,549	$ 3,446	$ 1,511	$ 61,793
Commercial	$ 18,388	$ 1,087	$ 788	$ 12,907
Industrial	$ 13,271	$ 43	$ 81	$ 16,208
Agriculture	$ 156	$ 0	$ 0	$ 446
Religious	$ 1,391	$ 330	$ 0	$ 3,215
Government	$ 467	$ 0	$ 0	$ 1,865
Education	$ 234	$ 0	$ 0	$ 6,454
Total	**$ 78,455**	**$ 4,907**	**$ 2,381**	**$ 102,889**

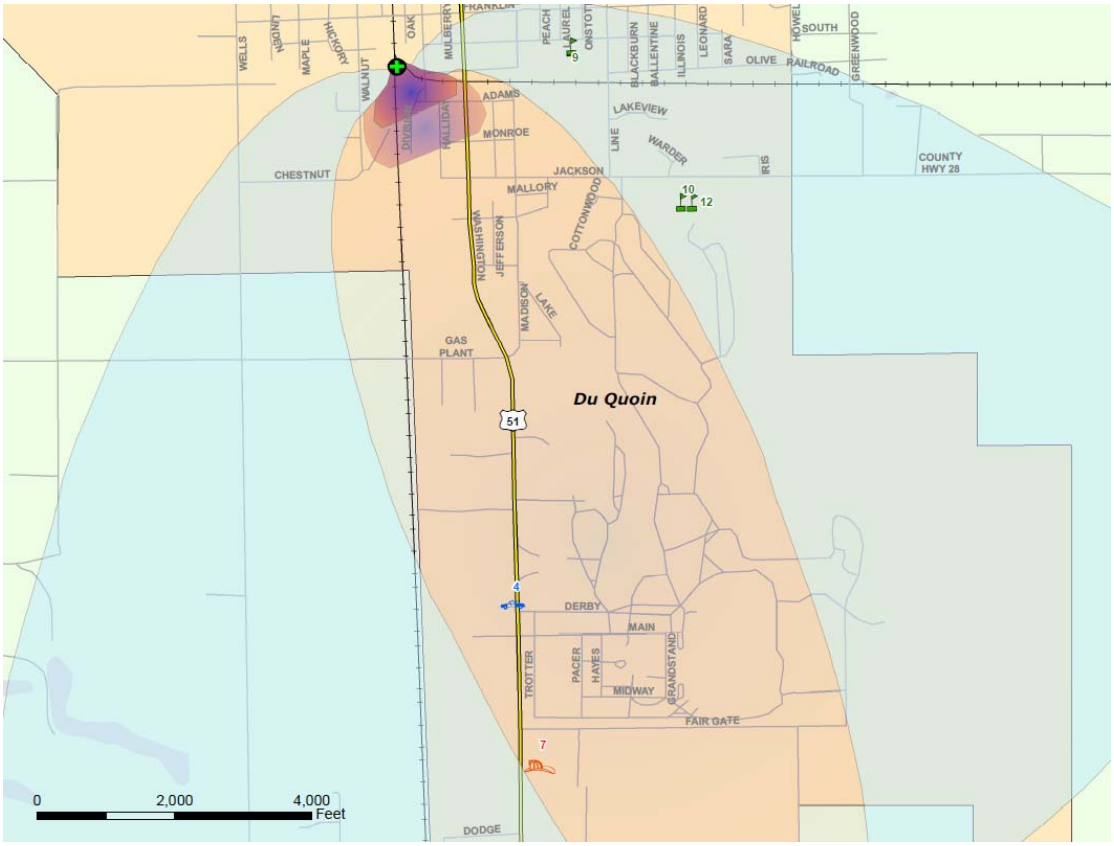
Essential Facilities Damage

There are six essential facilities within the limits of the chemical spill plume. The affected facilities are identified in Table 4-35. Their geographic locations are depicted in Figure 4-19.

Table 4-35: Essential Facilities within Plume Footprint

Name
District 13 Headquarters - State Police
Du Quoin Fire Department Station 2
Christian Fellowship School
Du Quoin High School
Du Quoin Middle School
Du Quoin Elementary School

Figure 4-19: Essential Facilities within Plume Footprint



Vulnerability to Future Assets/Infrastructure for Hazardous Materials Storage and Transport Hazard

Much new development in Perry County is in close proximity to transportation corridors, such as along U.S. Route 51. These areas are particularly vulnerable to chemical releases because of transportation of hazardous materials.

Analysis of Community Development Trends

Because of the concentration of new development in proximity to the transportation network, future development is likely to be vulnerable. The major transportation routes and the industries located in Perry County pose a threat of dangerous chemicals and hazardous materials release.

4.4.7 Ground Failure Hazard

Subsidence

Subsidence, sinking of the land surface, in Illinois is usually associated with either underground mining or collapse of soil into crevice in underling soluble bedrock. Areas at risk for subsidence can be determined from detailed mapping of geologic conditions or detailed mine maps. Data sources were compiled from the Illinois Geologic Survey and Illinois Department of Natural Resources to assess the risk of subsidence in Perry County. This section provides an overview of the subsidence hazards in Illinois in general and a discussion of the potential subsidence risk for Perry County.

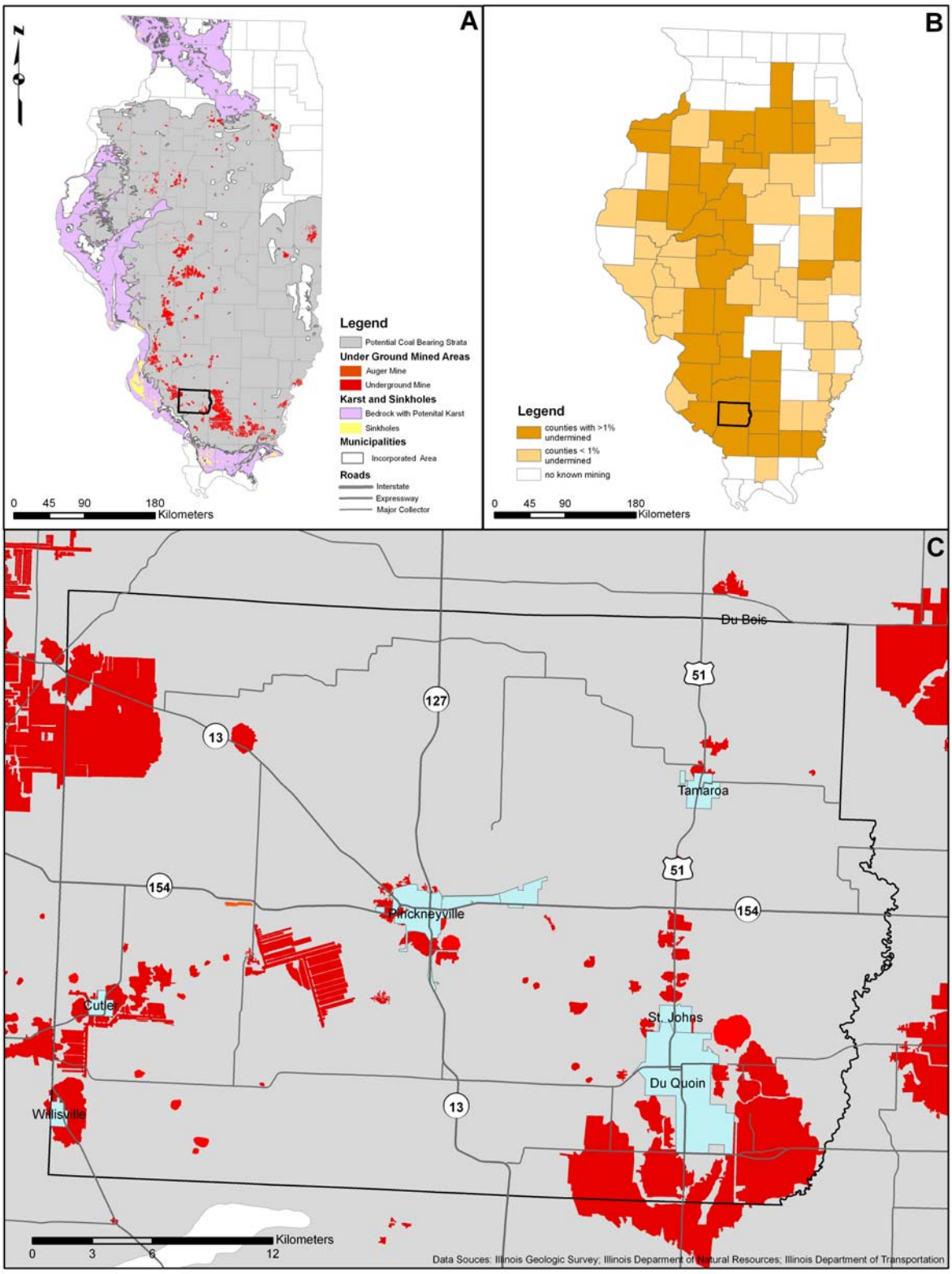
Underground Mining and Subsidence

Underground mines have been used extensively in Illinois to extract coal, lead, zinc, fluorites, shale, clay stones, limestone, and dolomite. When mining first began in Illinois, land over mined areas was sparsely populated. If the ground subsided, homes or other structures were seldom damaged. As towns and cities expanded over mined-out areas, subsidence damage to structures became increasingly more common. The most common underground mines in Illinois are coal mines. A recent study in Illinois has found that about 333,100 housing units were located over or adjacent to 839,000 acres mined for coal (Bauer, 2008).

Illinois has abundant coal resources. All or parts of 86 of 102 counties in the state have coal-bearing strata. As of 2007, about 1,050,400 acres (2.8% of the state) have been mined. Of that total, 836,655 acres are underground mines (Bauer, 2008). Illinois ranks first among all U.S. states for reserves of bituminous coal (Illinois Coal Association, 1992).

Figure 4-20a shows the statewide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines. Figure 4-20b shows the counties which are 0, < 1%, and >1% undermined; Fig 4-20c shows the countywide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines.

Figures 4-20a, 4-20b, and 4-20c: Maps of Statewide and Countywide Areas with Subsidence Hazard Potential



Mining Methods

There are two fundamental underground mining methods used in Illinois: high-extraction methods such as long-wall and low-extraction room-and pillar mining. High-extraction methods remove almost all of the coal in localized areas. For modern mining practices, subsidence associated with high-extraction methods in planned and regulated by state and federal authorities. The subsurface subsides above the mine within several days or weeks after the coal has been removed. Subsidence of the over-burden above the mined-out area can continue up to seven years after subsurface removal, depending on the local geologic conditions (Bauer, 2008). The initial ground movements associated with this mining, which tend to be the largest, diminish rapidly after a few months. After subsidence has decreased to a level that no longer causes damage to structures, the land may be suitable for development. The maximum amount of subsidence is proportional to the amount of material extract and the depth between the mining and the surface. In general, over the centerline of the mine panel, subsidence can be 60 to 70% of the extract material (e.g., 10 ft of material extracted would cause a maximum subsidence of six to seven feet; Bauer, 2006).

For low-extraction techniques such a room-and-pillar mining, miners create openings (rooms) as they work. Enough of the coal layer is left behind in the pillars to support the ground surface. In Illinois this system of mining extracts 40% to 55% of the coal resources in modern mines and up to 75% is some older mines. Based on current state regulations, room-and-pillar mines in operation after 1983 that do not include planned subsidence must show that they have a stable design. Although these permitting requirements have improved overall mine stability, there are no guarantees that subsidence will not occur above a room-and-pillar mine in the future. In general, if coal or other mined resources has been removed from an area, subsidence of the overlying material is always a possibility (Bauer, 2006).

Types of Mine Subsidence

In Illinois, subsidence of the land surface related to underground mining undertakes two forms: pit subsidence or trough (sag) subsidence. Pit subsidence structures are generally six to eight feet deep and range from two to 40 feet in diameter. Pit subsidence mostly occurs over shallow mines that are <100 feet deep and where the overlying bedrock is <50 feet thick and composed of weak rock materials such as shale. The pit is produced when the mine roof collapses and the roof fall void works its way to the surface. These structures form rapidly. If the bedrock is only a few feet thick and the surface material are unconsolidated (loose), these material may fall into adjacent mine voids, producing a surface hole deeper than the height of the collapse mine void. Pit subsidence can cause damage to a structure if it develops under the corner a building or support post of a foundation or other critical location. Subsidence pits should be filled to ensure that people or animals don't fall into these structures (Bauer, 2006).

Trough (or "sag") subsidence forms a gentle depression over a broad area. Some trough subsidence may be as large as a whole mine panel (i.e. several hundred feet long and a few hundred feet wide). Several acres of land may be affected by a single trough event or feature. As discussed above, the maximum vertical settlement is 60% to 70% of the height of material removed (e.g., two to six feet). Significant troughs may develop suddenly (in a few hours or

days) or gradually over a period of years. Troughs originate over places in mines where pillar have collapsed, producing downward movement at the ground surface. These failures can develop over mines of any depth. Trough subsidence produce an orderly pattern of tensile features (tension cracks) surrounding a central area of possible compression features. The type and extent of damage to surface structures relate to their orientation and position within a trough. In the tension zone, the downward-bending movements that develop in the ground may damage buildings, roads, sewer and water pipes, and other utilities. The downward bending of the ground surface causes the soil to crack, forming the tension cracks that pull structures apart. In the relatively smaller compression zone, roads my buckle and foundation walls may be pushed inward. Buildings damaged by compressional forces typically need their foundations rebuilt. They may also need to be leveled due to differential settling (Bauer, 2006).

Mine Subsidence Insurance

The Mine Subsidence Insurance at of 1979 created subsidence insurance as part of an Illinois homeowner's policy. Homeowners in any of the Illinois counties undermined by approximately 1% or more automatically have mine subsidence insurance as a part of their policy, unless coverage is waived in writing. Mine subsidence insurance is especially important for homes located near or over mines that operated before the 1977 Surface Mine Control and Reclamation Act. The companies that operated these mines may no longer be in business (Bauer, 2006).

Mine Subsidence in Perry County

Nearly all of Perry County is underlain by rock units which contain coal. Analysis of the GIS data layer of active and abandoned coal mines in Illinois obtained from the Illinois Department of Natural Resources (ILDNR) revealed that 119 km^2 out of Perry County's total 1158 km^2 (10%) have been undermined. The undermined areas general are in the area of Du Quoin, Pinckneyville, Cutler, Willisville, and along IL Route 13 in the northwest corner of the County. Comparison of the GIS layer of structures within the County attained from Perry County E-911 Office with ILDNR GIS layer of active and abandoned underground-coal mines was performed. This analysis revealed that 2,701 out of the 10,520 or 26% of the buildings in the county were above undermined areas.

Mine subsidence impacting the residents of southern Illinois, and specifically Perry County, have been documented in the local and regional press for several decades. For example in adjacent Jackson County, a sudden mine subsidence caused a portion of U.S. Route 51 to sink up eight feet, causing an injury accident on December 24, 2001. An Illinois Department of Transportation field maintenance technician reported that similar collapses have occurred along other state roads throughout the region (Homan, 2001).

Subsidence Related to Karst Features

Subsidence can also occur on land located over soluble bedrock. The land over such bedrock often has topography characteristic of past subsidence events. This topography is termed “karst.” Karst terrain has unique landforms and hydrology found only in these areas. Bedrock in a karst areas are typically limestone, dolomite, or gypsum. In Illinois, limestone and dolomite (carbonate rocks) are the principle karst rock types. 9% of Illinois has carbonate rock types close enough to the ground surface to have a well developed karst terrain. The area in Illinois in which the karst terrain is most developed is the southern and southwestern part of the state (Panno, et al., 1997). The karst feature most associated with subsidence is the sinkhole.

Sinkhole Formation

A sinkhole is an area of ground that has no natural external surface drainage—when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres and from less than one to more than 100 feet deep. Typically, sinkholes form slowly, so that little change is seen during a lifetime, but they also can form suddenly when a collapse occurs. Such a collapse can have a dramatic effect if it occurs in a populated setting.

Sinkholes form where rainwater moves through the soil and encounters soluble bedrock. The bedrock begins to dissolve along horizontal and vertical cracks and joints in the rock. Eventually, these cracks become large enough to start transporting small soil particles. As these small particles of soil are carried off, the surface of the soil above the conduit slump down gradually, and a small depression forms on the ground surface. This depression acts like a funnel and gathers more water, which makes the conduit still larger and washes more soil into the conduit.

Sinkhole Collapse

Sudden collapse of a sinkhole occurs where the soil close to the ground surface does not initially slump down, but instead forms a bridge. Beneath that surface cover, a void forms where the soil keeps washing into the conduit. These voids are essentially shallow caves. Over time, the void enlarges enough that the weight of the overlying bridge can no longer be supported. The surface layer then suddenly collapses into the void, forming a sinkhole.

The process of forming a conduit and a soil bridge usually takes years to decades to form. However this natural process can be aggravated and expedited by human activates. Since the process of forming a sinkhole depends on water to carry soil particle down into the karst bedrock, anything that increases the amount of water flowing into the subsurface can accelerate sinkhole formation process. Parking lots, streets, altered drainage from construction, and roof drainage are a few of the things that can increase runoff.

Collapses are more frequent after intense rainstorms. However, drought and altering of the water table can also contribute to sinkhole collapse. Areas where the water table fluctuates or has suddenly been lowered are more susceptible to sinkhole collapse.

It is also possible for construction activity to induce the collapse of near-surface voids or caves. In areas of karst bedrock, it is imperative that a proper geotechnical assessment be completed prior to construction of any significant structures. Solutions to foundation problems in karst terrain generally are expensive (White, 1988).

Sinkhole Subsidence or Collapse Potential for Perry County

Nearly all of Perry County is underlain by insoluble bedrock, and therefore subsidence from this mechanism should not be a concern.

Hazard Extent for Subsidence

The extent of subsidence hazard in Perry County is a function of where current development is located relative to (1) areas of past and present underground mining, and (2) areas of soluble bedrock.

Calculated Risk Priority Index for Ground Failure

Based on historical information, future ground failure in the affected regions of Perry County is possible. According to the RPI, ground failure ranked as the number seven hazard in the county.

RPI = Probability x Magnitude/Severity.

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

Vulnerability Analysis for Ground Failure

The existing buildings and infrastructure of Perry County are discussed in types and numbers below. In addition, a discussion of the potential impacts for buildings and infrastructure as a result of ground failure is also included.

Critical Facilities

Any critical facility built above highly soluble bedrock could be vulnerable to land subsidence. A critical facility will encounter the same impacts as any other building within the affected area. These impacts include damages ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations can cause cracking of critical structural elements. Table 4-8 lists the types and numbers of all of the critical facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

General Building Stock

Table 4-9 lists the building exposure in terms of types and numbers of buildings for the entire county. The buildings within this area can anticipate impacts similar to those discussed above for critical facilities, ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations causes cracking of critical structural elements.

Infrastructure

In the area of Perry County affected by ground subsidence the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with land collapsing directly beneath them in a way that undermines their structural integrity. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (i.e. loss of power or gas to community); and railway failure from broken or impassable railways. In addition bridges could fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Ground Failure

New buildings and infrastructure placed on undermined land or on highly soluble bedrock will be vulnerable to ground failure.

Analysis of Community Development Trends

Abandoned underground mine subsidence may affect several locations within the county; therefore buildings and infrastructure are vulnerable to subsidence. Continued development will occur in many of these areas. Currently, Perry County reviews new development for compliance with the local zoning ordinance. Newly planned construction should be reviewed with the historical mining maps to minimize potential subsidence structural damage.

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Section 5 - Mitigation Strategy

The goal of mitigation is to reduce a hazard's future impacts including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. The goal of mitigation is to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment; Perry County's is provided in Section 4 of this plan. Mitigation should be an ongoing process that adapts over time to accommodate the 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)

The county and all of its communities are members of the NFIP. HAZUS-MH estimates that approximately seven households were located in the Perry County Special Flood Hazard Area; as of June 18, 2007, the Federal Emergency Management Agency NFIP Insurance Report for Illinois stated that 23 households paid flood insurance, insuring $1,002,500 in property value. The total premiums collected amounted to $6,376, which on average was $277 annually. From 1978 to 2007, 5 claims were filed totaling $10,762. The average claim was $2,152.

The county and incorporated areas do not participate in the National Flood Insurance Program's (NFIP) 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 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	Flood Plain Zoning Ordinance Adopted Last
Perry County	9/13/1996	8/1/1980	N/A	N/A	8/13/1996
City of Du Quoin	7/2/1987	7/2/1987	N/A	N/A	10/23/2006
City of Pinckneyville	9/16/1982	9/16/1982	N/A	N/A	11/20/2006

In Perry County only two out of the six incorporated communities participate in the NFIP. These four incorporated communities (Villages of Cutler, St. Johns, Tamaroa, and Willsville) have no identified flood hazard boundaries; therefore, the communities do not participate in the NFIP.

5.1.2 Stormwater Management Stream Maintenance Ordinance

The City of Pinckneyville has a stormwater management element of the Subdivision Ordinance, Chapter 151. A subdivider is required to provide for standards of design and standards governing the following: streets, alleys, public ways, ways for public service facilities, street lights, public grounds, size and lots to be used for residential purposes, storm and flood water run-off channels and basins, water supply and distribution, and sanitary sewers, sewage collection, and treatment in conformity with the applicable requirements of the ordinances, including the official map.

The Village of Willisville has a stormwater management plan as an element of the Subdivision Ordinance, Article VI, Division I. This Code applies to all development within the limits of the village. Residential developments having a total area of less than five acres, and commercial or industrial developments having a total area of less than two acres, may be given a waiver by the Village Board in accordance with section 34-4-4 of this Code, subject to specific conditions described in section 34-6-4. The storage capacity and discharge rate is based upon the calculated volume and peak flow of the storm water runoff, respectively. The calculations for sites having an area of 100 acres or less are made using either the Illinois Manual for Soil Erosion and Sedimentation Control Method or the Rational Method. If the site is larger than 100 acres, than the Engineer uses the Illinois Manual for Soil Erosion and Sedimentation Control Method or another method can be use by the Engineer subject to review and approval. All new developments provide a stormwater system that ensures that the rate of flow does not exceed the rate of flow of stormwater run-off before development in a 25-year storm, unless given a waiver by the Board.

5.1.3 Zoning Management Ordinance

Table 5-2 identifies the dates that each city and village adopted land use planning and zoning ordinances within the county. Perry County and the villages of Willisville and Tamaroa each have zoning administrators.

Table 5-2: Description of Zoning Plans/Ordinances

Community	Comp Plan	Zoning Ord	Subd Control Ord	Erosion Control	Storm Water Mgmt	Burning Ord.	Seismic Ord.	Bldg. Stndrds.
Perry County	5/14/1965	12/18/2007	4/26/1999	N/A	N/A	9/2008	N/A	12/18/2007
Village of Cutler	N/A	N/A	N/A	N/A	N/A	11/7/2002	N/A	N/A
City of Du Quoin	4/14/2008	6/27/1995	N/A	N/A	N/A	N/A	N/A	2/3/1967
City of Pinckneyville	1965	N/A	7/14/1964	N/A	7/14/1964	N/A	12/23/1996	N/A
Village of St. Johns	7/1/1964	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Tamaroa	N/A	6/11/2008	N/A	N/A	N/A	5/12/2004	N/A	N/A
Village of Willisville	6/4/2008	6/4/2008	6/5/2000	6/5/2000	6/5/2000	N/A	N/A	2006

5.1.4 Erosion Management Program/ Policy

Perry County utilizes the Illinois Administrative Code Title 35 and the Illinois Environmental Protection Act, administered by the Illinois Environmental Protection Agency. This requires the submission of a Stormwater Pollution Prevention Plan (SWPPP) for projects involving more than one acre of land disturbance.

The Village of Willisville has an erosion control management policy as an element of the Subdivision Ordinance, Article VI, Section 34-6-15. Principal spillways and outlet works must be designed to prevent erosion, and if necessary, must be equipped with energy dissipating devices to slow the water to normal velocity as called out in the IPSUSESC Manual. Special measures are taken by the developers to keep sediment from filling the proposed detention basin during all construction of the proposed development.

5.1.5 Fire Insurance Rating Programs/ Policy

Table 5-3 lists the fire departments in Perry County, as well as the ISO rating and the number of members in each department.

Table 5-3: Listing of Fire Departments, Ratings, and Number of Firefighters

Fire Department	Fire Insurance Rating	Number of Firefighters
Cutler Fire Protection District	ISO 7/8	12
Du Quoin Fire Dept. – Station 1	ISO 4	21
Du Quoin Fire Dept. – Station 2	ISO 4	0
Pinckneyville Fire Dept.	ISO 5	25
Pinckneyville Fire Protection District	ISO 8	0
Tamaroa Fire Protection District	ISO 5/6	24
Willisville Fire Department	ISO 6	13

5.1.6 Land Use Plan

Table 5-2 identifies the area Comprehensive Plans within Perry County.

5.1.7 Building Codes

The Perry County Zoning Ordinance states that all residential structures, except mobile homes, must adhere to the International Residential Code. This ordinance is exempt in communities that have a zoning ordinance, which includes Du Quoin, Tamaroa, and Willisville. Table 5-2 identifies the building standards adopted within the county. Willisville adopted a Property Maintenance Code and Du Quoin adopted the Uniform Building Code. Many of the building codes for manufactured homes require tie-downs to minimize wind effects. There are no building codes specific to seismic control.

5.2 Mitigation goals

The Perry County Emergency Management Agency, Southern Illinois University-Carbondale Geology Department, The Polis Center of IUPUI, and the Greater Egypt Regional Planning &

Development Commission assisted the Perry County Multi-Hazard Mitigation Planning Team in the formulation of mitigation strategies and projects for Perry County. The goals and objectives set forth were derived through participation and discussion of the views and concerns of the Perry County Multi-Hazard Mitigation Team members and related public input. The MHMP will focus on these goals, with a great deal of public input, to ensure that the priorities of the communities are represented.

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 which will assist the communities to attain the listed goals. Table 5-5 lists mitigation actions, which are defined projects that will help to complete the defined goals and objectives.

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

(a) Objective: Retrofit critical facilities 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 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 Perry County.

Goal 2: Create new or revise existing plans/maps related to hazards affecting Perry County

(a) Objective: Support compliance with the NFIP for each jurisdiction in Perry County.

(b) Objective: Review and update existing 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 the public on the hazards affecting Perry County

(a) Objective: Raise public awareness on hazard mitigation.

(b) Objective: Improve education of emergency personnel and public officials.

5.3 Mitigation Actions/Projects

Upon completion of the risk assessment and development of the goals and objectives, the Planning Committee was provided with 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 impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held December 16, 2008, MHMP members were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The MHMP members brought their mitigation ideas to Meeting #4, which was held January 22, 2009. The evaluation criteria (STAPLE+E) involved the following categories and questions.

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?

The development of the MHMP is the first step in a multi-step process to implement projects and policies to mitigate hazards in the county and its communities.

5.3.1 Completed or Current Mitigation Actions/Projects

Since this is the first mitigation plan developed for Perry County, there are no deleted or deferred mitigation items. The following tables will refer to completed, ongoing, or future mitigation actions. Table 5-4 presents the completed and ongoing mitigation actions and projects in the county.

Table 5-4: Completed/Ongoing Mitigation Actions

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Hard wire a warning system to schools	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	Tornado, Thunderstorms	Du Quoin, Pinckneyville, Tamaroa, School Districts	Perry County Emergency Management Agency oversaw this project. It was completed as of February 2009.
Install fire sirens	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	Tornado, Thunderstorms	Pinckneyville	The City of Pinckneyville oversaw this project. It was completed as of February, 2009.
Conduct severe weather spotting training within the county	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Improve education of emergency personnel and public officials	Tornado, Thunderstorm	Perry County	Perry County EMA, NOAA, and IEMA oversaw this project It was completed as of February, 2009.
Establish public outreach programs to educate the public about potential hazards; e.g. create public service announcements	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Raise public awareness on hazard mitigation	Tornado	Perry County	Perry County EMA, IEMA, FEMA oversaw this project. It was ongoing as of February, 2009.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Purchase back-up generators for critical buildings	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Equip public facilities and communities to guard against damage caused by hazards	Tornado, Thunderstorm, Flood, Earthquake, Winter Storm	Perry County	Perry County oversaw this project. A back-up generator was purchased for the County Sheriff's Office.
Conduct a study for stormwater runoff	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Flood	Tamaroa	The Village of Tamaroa oversaw this project. It was completed as of February, 2009.
Update the zoning ordinance to reflect issues relating to the 100-year flood	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Support compliance with the NFIP	Flood	Perry County	Perry County Floodplain Manger oversaw this project. It was completed in August, 1996.
Conduct a flood study	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Flood	Du Quoin	The City of Du Quoin oversaw this project. It was completed as of February, 2009.
Produce new DFIRM for the county	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Support compliance with the NFIP for each jurisdiction in Perry County	Flood	Perry County	Perry County is overseeing this project. It is ongoing and expected to be complete in 2010.
Create an underground mining map	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Earthquake, Ground Failure	Perry County	Illinois Department Natural Resource oversaw this project. It was completed as of February, 2009.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Follow the current state regulations regarding mine subsidence (1% Insurance Coverage)	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Improve education of emergency personnel and public officials	Ground Failure	Perry County	Illinois Department Natural Resource oversaw this project. It was ongoing as of February, 2009.
Establish internet-based ICE callouts for hospitals	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	HAZMAT	Du Quoin	Perry County Health Department oversaw this project It was completed as of February, 2009.
Purchase HAM radios for public facilities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	HAZMAT/ Tornado/ Thunderstorm/ Winter Storm	Du Quoin	Perry County EMA oversaw this project. It was completed as of February, 2009.
Create a list of resources for facilities and equipment	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	Winter Storm	Perry County	Perry County EMA and Sheriffs Office oversaw this project. It was completed as of February, 2009.
Trim trees where necessary within the county	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards	Winter Storm	Perry County	AMREN and Local Electric Cooperatives oversaw this project. The utility working with the communities have a tree trimming program.
The Zoning Ordinance to requires tie-downs for mobile homes	**Goal:** Lessen the impact of hazards on loss of life and property **Objective:** Minimize the amount of residential life and property exposed to hazards	Tornado, Thunderstorm	Perry County, Cutler, Pinckneyville, St. Johns,	The Perry County Zoning Ordinance requires mobile home tie-downs

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Clean drainage ditches and provide stream maintenance, i.e. clear debris from the stream bed	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards	Flood	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	The USDA-NRCS and County Highway Dept. oversees the implementation of this project. It continues to be ongoing.
The Zoning Ordinances protects the county against mine operations	**Goal:** To protect agriculture and residential land use from mining operations **Objective:** Require permits from IDNR and Perry County. Require performance bonds. For mining projects	Ground Failure	Perry County, Cutler, Pinckneyville, St. Johns	The Perry County Zoning Ordinances protects residents from mining operation by requiring minimal setback from existing residents and residential districts.

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 initially. 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, permission, and/or 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. A rating of High, Medium, or Low was assessed for each mitigation item and is listed next to each item in Table 5-6. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 5-5.

Table 5-5: STAPLE+E planning factors

S – Social	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.
T – Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	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.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	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.
E – Environmental	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 implementation of any mitigation actions. Table 5-6 presents mitigation projects developed by the planning committee.

Table 5-6: Mitigation Strategies

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Establish a community-wide shelter area and various other shelters	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Improve emergency sheltering in Perry County	All	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	High	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the cost benefit of heating and cooling centers and define specific locations. Funding has not been secured as of 2009. Implementation is forecasted to be initiated within approximately one year.
Develop public outreach program to instruct public on what to do during potential hazards	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Raise public awareness on hazard mitigation	All	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	High	The County EMA, schools, Red Cross, and other organizations have implemented various forms of this strategy. Local resources have been used to target and inform the resident population. Additional funding will be sought from the Pre-Disaster Mitigation program.
Purchase back-up generators for critical facilities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Equip public facilities and communities to guard against damage caused by hazards	Tornado, Thunderstorm, Flood, Earthquake, Winter Storm, Ground Failure	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	High	The County EMA will oversee the implementation of this project. Local resources and additional grants will be used to procure the systems. If funding is available, is forecasted to be complete within approximately one year.
Conduct new training programs for EMA	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Improve education of emergency personnel and public officials	HAZMAT, Earthquake	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Medium	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the capabilities of the Hazmat Response Team. Funding has not been secured as of 2009. Implementation, if funding is available, is forecasted to be complete within approximately three years.
Purchase personal protective equipment for Du Quoin Fire Department	**Goal:** Develop long-term strategies to educate the public on the hazards affecting Perry County **Objective:** Improve education of emergency personnel and public officials	HAZMAT	Du Quoin	Medium	The City of Du Quoin and County EMA will oversee the implementation of this project. Funding has not been secured, but additional funding will be sought from Department of Homeland Security and local resources. Implementation is forecasted to be complete within approximately three years.
Designate approved HAZMAT transportation routes	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	HAZMAT	Perry County	Medium	The County EMA will oversee the implementation of this project. Funding has not been secured, but additional funding will be sought from local resources. Implementation is forecasted to be complete within approximately three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Harden fire stations	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objection:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing	Tornado, Thunderstorm Earthquake	Cutler	Medium	The Village of Cutler and Perry County EMA will oversee the implementation of this project. Funding has not been secured as of 2009, but the pre-disaster mitigation program and community development grants are a possible funding source. Implementation, if funding is available, is forecasted to be initiated within approximately three years.
Establish Reverse 911	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	All	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Medium	The County EMA will oversee the implementation of this project. Funding has not been secured, but additional funding will be sought from the Homeland Security program funds. Implementation is forecasted to be complete within approximately three years.
Purchase weather radios for nursing homes and childcare facilities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	All	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Medium	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the cost benefits of the system. Funding has not been secured as of 2009. If funding is available, is forecasted to be complete within approximately three years.
Harden Du Quoin High School	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objection:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing	Tornado, Thunderstorm Earthquake	Du Quoin	Medium	The City of Du Quoin and Perry County EMA will oversee the implementation of this project. Funding has not been secured as of 2009, but the pre-disaster mitigation program and community development grants are a possible funding source. Implementation, if funding is available, is forecasted to be initiated within approximately three years.
Install warning sirens in residential unincorporated communities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	Tornado, Thunderstorm	Pinckneyville	Medium	The City of Pinckneyville and the County EMA will oversee the implementation of this project. Local resources and additional grants will be used to procure the systems. If funding is available, is forecasted to be complete within approximately three years.
Implement a plan for voluntary buyouts for structures on White, Walnut Road, Mud Line, Matthews Church Road, East Park Street	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Support compliance with the NFIP	Flood	Perry County, Pinckneyville	Medium	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Table 4-19 presents potential buyout properties. Funding has not been secured, but additional funding will be sought from the Pre-Disaster Mitigation program. Implementation is forecasted to be initiated within approximately three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct an engineering study for Du Quoin State Fair Ground's grandstand to make improvements which would result in a community safe room	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Tornado, Thunderstorm, Earthquake	Du Quoin	Low	The State will oversee the implementation of this project. State resources will be used to evaluate the severity of the study. Funding has not been secured. Implementation is forecasted to be complete within approximately five years.
Conduct stormwater management studies and projects	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Flood	Du Quoin, Cutler	Low	The City of Du Quoin, Village of Cutler, and County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Funding has not been secured, but additional funding will be sought from community development grants. Implementation is forecasted to be initiated within approximately five years.
Conduct flood studies to determine possible road elevation throughout the county as follows: <u>County Roads</u> Ski and Pin Tail Rd. E. Cargin Rd. S. Cudge Town Rd. Kimle Rd. Pick Rd. <u>Du Quoin</u> S. Washington Rd. N. Hickory Rd. <u>Cutler</u> E. Mill St. W. Heatherton St. N. Oak St.	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Flood	Du Quoin, Cutler, Perry County	Low	The City of Du Quoin, Village of Cutler, and County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Funding has not been secured, but additional funding will be sought from Illinois Department of Transportation. Implementation is forecasted to be complete within approximately five years.
Conduct a geotechnical study for the jail and county courthouse	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Earthquake	Perry County	Low	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Funding has not been secured, but additional funding will be sought from the Pre-Disaster Mitigation program. Implementation is forecasted to be complete within approximately five years.
Conduct a bridge study and geotechnical earthquake analysis	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Earthquake	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Low	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Funding has not been secured, but additional funding will be sought from IDOT. Implementation is forecasted to be complete within approximately five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Install a mobile potable water filtration system with storage	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Improve emergency sheltering in Perry County	All	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Low	The county, local government, and County EMA will oversee the implementation of this project. Funding has not been secured as of 2009. The project is forecasted to be complete within approximately five years.
Harden anhydrous ammonia storage facilities and install surveillance	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing	HAZMAT	Pinckneyville	Low	The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the magnitude of the project. Funding has not been secured, but additional funding will be sought from Department of Justice Grants. Implementation is forecasted to be complete within approximately five years.
Construct snow fences on SR154, SR150, and SR152	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards	Winter Storm	Cutler, Pinckneyville, Perry County	Low	The Village of Cutler, City of Pinckneyville, and County EMA will oversee the implementation of this project. Funding has not been secured, but additional funding will be sought from the Pre-Disaster Mitigation program. Implementation is forecasted to be complete within approximately five years.
Identify potential snow routes and purchase signage	**Goal:** Create new or revise existing plans/maps related to hazards affecting Perry County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies	Winter Storm	Perry County, Cutler, Du Quoin, Pinckneyville, St. Johns, Tamaroa, Willisville	Low	The County EMA will oversee the implementation of this project. Funding has not been secured, but additional funding will be sought from local resources. Implementation is forecasted to be complete within approximately five years.
Implement a text alert system (ICE) for schools	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county	All	Du Quoin, Pinckneyville, Tamaroa, School Districts	Low	The County EMA and local school systems will oversee the implementation of this project. Funding has not been secured, but it may be sought from local resources. Implementation, if funding is available, is forecasted to be complete within five years.

The Perry County Emergency Management 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. Greater Egypt Regional Planning & Development Commission is qualified to provide technical grant writing services to assist the county in seeking resources to achieve the recommended mitigation action.

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 7 jurisdictions, including Perry 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.

Section 6 - Plan Maintenance

6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, Perry County Emergency Management Director will reconvene the MHMP planning committee to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during January 2014 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 arises, due to new developments or a declared disaster, the team will meet as necessary 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, this 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. Many of the mitigation projects identified as part of this planning process are ongoing. If necessary, the County and its incorporated jurisdictions will update the planning documents, zoning plans, and ordinances listed in Tables 1-4 and 5-1 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 Perry County Emergency Management Director and forwarded to the MHMP planning committee for discussion. Education efforts for hazard mitigation will be on-going through the local television stations,

brochures, and yearly public meetings. Once adopted, a copy of this plan will be posted in the local public library and on the county website.

Glossary of Terms

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

A

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

B

BFE – Base Flood Elevation

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

E

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

F

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

G

GIS – Geographic Information System

H

HAZUS-MH – **Ha**zards **US**A **M**ulti-**H**azard
HUC – Hydrologic Unit Code

I

IDNR – Illinois Department of Natural Resources
IEMA – Illinois Emergency Management Agency

M

MHMP – Multi-Hazard Mitigation Plan

N

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

P

PPM – Parts Per Million

R

RPI – Risk Priority Index

S

SPC – Storm Prediction Center
SWPPP – Stormwater Pollution Prevention Plan

U

USGS – United States Geological Survey

Appendix A – Minutes of the Multi-Hazard Mitigation Planning Team Meetings

COUNTY OF PERRY, ILLINOIS
Board of County Commissioners
Post Office Box 438 - Pinckneyville, Illinois 62274

Lora Booker	James Epplin	Robert D. Kelly
Commissioner	Chairman, Board of Commissioners	Commissioner

August 19, 2008

Mr. William Place
Perry County Emergency Management Agency
12 East Water Street
Pinckneyville, IL 62274

Dear Mr. Place:

This letter certifies that the Perry County Board representative met previously with the Polis Group, SIU-C Geology Department and the Greater Egypt Regional Planning and Development Commission staff regarding the Pre Disaster Mitigation plan development and identified members of the Perry County Planning Team. The Planning Team membership may be expanded to include a wider range of stakeholders. It is understood that the Planning Team may add additional participants during the planning process.

The County Board certifies that the initial Planning Team and other participants added during the planning process is recognized as the Perry County Planning Team. The EMA Director, William Place, chairs the planning team, and is assisted in facilitating the program by the Polis Group, Indianapolis, Indiana; SIU-C Geology Department; and the Greater Egypt Regional Planning and Development Commission.

Sincerely,

James Epplin

JAMES EPPLIN, Chairman
Perry County Board of Commissioners

IEMA Pre-Disaster Mitigation Plan

Planning Program Oversight Meeting:
County Board Chairmen, Emergency Management Agencies, Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPIU-Polis

Meeting Date: Wednesday, March 19, 2008

Meeting Time: 1 hour 30 minutes

Place: SIUC Student Center, Kaskaskia Room

Attendance:

Dave Coats	POLIS
John Buechler	POLIS
Nicholas Pinter	SIUC Geology
Andy Flor	SIUC Geology
Harvey Henson	SIUC Geology
Ike Kirkikis	Greater Egypt Regional Planning & Development Commission
Robert Clodi	Greater Egypt Regional Planning & Development Commission
James Epplin	Perry County Board Chairman
John Evans	Jackson County Board Chairman
Brent Gentry	Williamson County Board Chairman
Randall Crocker	Franklin County Board Chairman
Ted Buck	Jefferson County Board Chairman
Alan Gower	Williamson County EMA
Dennis Litton	Jefferson County EMA
Michael Richmond	Perry County EMA
Derek Misener	Jackson County EMA.

The meeting is called to order

Dave Coats (associate director) **and John Buechler** (project manager) from IUPUI, Polis Center explained the Pre-Disaster Mitigation Planning Project. It was explained that FEMA, based on federal legislation passed in 2000, required that all incorporated communities must have a Pre-Disaster Mitigation Plan in place to be eligible for FEMA mitigation funding. They also explained that a 25% match was needed to receive funding. John Buechler stated that the value of the GIS data and sweat equity that will be put into developing this plan would satisfy the match. He also expresses the importance of tracking and documenting the time spent on the project by each volunteer working on the project.

Dave Coats and John Buechler explained the process for developing the plan and that it will require a total of six meetings in each of the counties. They went into great detail about each of the meeting and the issues that would be addressed. They also estimated that the complete process of developing the plan would take about one year. Lastly, they introduced a website that the planning team will use to organize meeting, post documents, and to access minutes throughout the planning process.

Nicholas Pinter (SIUC Geology) introduced the SIUC team and explained the role they will play in planning process. SIUC will be providing all the technical mapping throughout the planning process.

Ike Kirkikis (Director, GERPDC) asked Andy Flor (SIUC Geology) about the agreement that will need to be made about the restricted use of the GIS data needed for the project. Andy Flor, Nicholas Pinter, Dave Coats, and John Buechler all confirmed that a Memorandum of Understanding would be created and sent to each county for review and acceptance. All the County Board Chairmen expressed their concerns with the discretion of the use of the GIS data.

Rob Clodi (Planner, GERPDC) asked how the planning team would be selected. Dave Coats responded and said that a list of affiliations is provided for ideal team member candidacy. He explained that the Emergency Management Agency is typically selected as the chair of the planning team. Lastly, he mentioned that the planning team must be officially recognized by the County Board. Nicholas Pinter added that as soon as a planning team is assembled the first meeting can be scheduled.

After a few questions that clarified the planning process, Dave Coats and John Buechler presented a Multi-Hazard Mitigation Planning of Posey County, Indiana for review.

Meeting was adjourned.

IEMA Pre-Disaster Mitigation Plan

Assembly of the Perry County Planning Team Meeting 1:
Chairman: William Place, Perry County Emergency Management Agency
Plan Directors: Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Tuesday, August 19, 2008

Meeting Time: 1 1/2 hours

Place: Du Quoin City Hall

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Andy Flor	SIUC Geology
Harvey Henson	SIUC Geology
John Beuchler	IUPUI-Polis
Robert Clodi	Greater Egypt Regional Planning & Development Commission
Ike Kirkikis	Greater Egypt Region Planning & Development Commission
Jim Epplin	Perry County Board Chairman
William Place	Perry County Emergency Management Agency
Dan Uhles	St. Johns Trustee
Keith Kellerman	Perry County Sheriff
Robin Edwards	Perry County Assessor's Office
Joe Riggio	Du Quoin Fire Department
Rich Dial	Ameren
Randy DeMent	Perry County 911
Jeff Ashauer	Perry County Office of Planning and Development
John Griffin	City of Pinckneyville Police Department
Doug Bishop	Perry County Engineer
Gary Kelly	Superintendent of Du Quoin CUSD #300

The meeting is called to order

Narrative: A presentation of the Pre-Disaster Mitigation Planning Process was given by Jonathan Remo.

Jonathan Remo 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 County Assessor's Office. The sweat equity will be an accumulation of

time spent at the meetings, on research assignments, surveys, along with 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 website is used to schedule meetings, post contact information and download material pertaining to the planning process.

Jonathan Remo divided the planning project into six meeting. At the 1st 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 3rd meeting. At that meeting, the SIUC Geology Department will present historic accounts of natural disasters that have affected this area. At the 2nd 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 3rd 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 4th 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 4th meeting the plan will be in its final draft form. At the 5th 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 6th 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.

Narrative: Jonathan Remo introduces Andy Flor.

Andy Flor presented three maps that identified critical facilities in the county. He asked the planning team to review these maps to identify any corrections that need to be made to the maps. He assigned research homework arranged by categories to individual planning team members to locate missing or incorrect critical facilities.

Narrative: A few clarifications where made about the planning process and the participation needed to complete the plan.

Meeting was adjourned

IEMA Pre-Disaster Mitigation Plan

Assembly of the Perry County Planning Team Meeting 2:

Chairman: William Place, Perry County Emergency Management Agency
Plan Directors: Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPIU-Polis

Meeting Date: Wednesday, October 15, 2008, at 2:00 pm

Meeting Time: 1.5 hrs

Place: Du Quoin City Hall

Planning Team/Attendance:

Chris Pully	IEMA
Rick Shryock	IEMA
Melvin Carrothers	Village of Cutler
Jim Epplin	Perry County Board
Doug Bishop	Perry County Engineer
Dan Uhles	Village of St. Johns
Jodi Schoen	Perry County Health Dept.
Raymond Clark	Du Quoin ESDA
Stuart Swallers	Du Quoin Police Dept.
Joe Riggio	Du Quoin Fire Dept.
James Gielow	Pinckneyville Fire Dept.
John Griffin	Pinckneyville Police Dept.
Jeff Ashauer	Perry County Economic Development
Tim O'Leary	Pinckneyville School District #50
Andy Flor	SIUC
Jonathan Remo	SIUC
Robert Clodi	Greater Egypt Regional Planning & Development Commission

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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 held today was to prioritize a list of disasters that are relevant to Perry County.

Robert Clodi stated the importance of achieving participation from each of the incorporated communities. He explained that the 3rd meeting is the most important to achieve community participation and will involve the general public as well. He presented the planning team with the first chapters of the plan for review, which was handed out at the end of the meeting. He also provided the planning team with in-kind forms to document the time each planning team member

has spent researching critical facilities information. Lastly, he presented the PDM Planning website and described the contents of the site.

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 a risk level to each disaster that was identified in Perry County. The risk level is ranked as followed:

Hazmat	1
Tornados	2
Earthquake	3
Thunderstorms/Wind	4
Winter Storms	5
Flood	6

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 in-kind forms and any missing information yet to be turn in, pertaining to critical facilities by the next meeting.

Meeting was adjourned.

IEMA Pre-Disaster Mitigation Plan

Assembly of the Perry County Planning Team Meeting 3:

Chairman: William Place, Perry County Emergency Management Agency
Plan Directors: Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPIU-Polis

Meeting Date: Tuesday, December 16, 2008, at 10:00 am

Meeting Time: 1.5 hrs

Place: Du Quoin City Hall

Planning Team/Attendance:

Melvin Carrothers	Village of Cutler
Jim Epplin	Perry County Board
Doug Bishop	Perry County Engineer
Dan Uhles	Village of St. Johns
Jodi Schoen	Perry County Health Dept.
David Searby	Du Quoin ESDA
Joe Riggio	Du Quoin Fire Dept.
James Gielow	Pinckneyville Fire Dept.
John Griffin	Pinckneyville Police Dept.
Jeff Ashauer	Perry County Economic Development
Mike Millikin	City of Pinckneyville Utility Supernatant
William Place	Perry County EMA
Randy DeMent	Perry County 911
Jon Moeckel	Perry County Health Dept.
Sherry Werz	Marshall Browning Hospital
Brent Kreid	Pinckneyville Community High School District #101
Dr. Gray Kelly	Du Quoin Community Unit school District #300
Andy Flor	SIUC
Nicholas Pinter	SIUC
Robert Clodi	Greater Egypt Regional Planning & Development Commission

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The meeting was called to order.

Robert Clodi opened the meeting by thanking everyone for coming and asked if representatives of the planning team had any knowledge of the ISO rating in Villages of Willisville, Tamaroa, and Cutler.

Narrative: Melvin Carrothers of the Village of Cutler volunteered to track down the information on Willisville and Cutler. William Place volunteered to gather information for Tamaroa.

Robert Clodi introduced Nicholas Pinter and gave a brief overview of what the meeting would cover that day.

Nicholas Pinter began by introducing his colleague Andy Flor. In his presentation, Nicholas reviewed Polis and SIU's role in the planning process. He offered Jonathan Remo and himself as points of contact throughout the planning process. Nicholas moved on to explain the topics and objectives of the current meeting that was being held. First Nicholas presented the planning team with the list of hazards the team had ranked by their level of risk.

Narrative: A copy of Chapter Four, Risk Assessment, was given to each of the planning team members to review.

Nicholas covered each hazard in his presentation and produced historical accounts of each topic. He then transitioned to the focus of the meeting, mitigation strategies. He defined mitigation as the act of avoidance and preparedness.

Narrative: A copy of Mitigation Ideas, produced by FEMA Region 5 on July 2002, was given to each of the planning team members for review.

Nicholas explained that content of the booklet and asked that each of the planning team members return to meeting 4 with three mitigation strategies for each of the hazards identified by the planning team. He closed his presentation by thanking everyone for participating.

Meeting was adjourned.

IEMA Pre-Disaster Mitigation Plan

Assembly of the Perry County Planning Team Meeting 4:

Chairman: William Place, Perry County Emergency Management Agency
Plan Directors: Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPIU-Polis

Meeting Date: Thursday, January 22, 2009, at 9:30 am

Meeting Time: 1.45 hrs

Place: Du Quoin City Hall

Planning Team/Attendance:

Melvin Carrothers	Village of Cutler
Jim Epplin	Perry County Board
Doug Bishop	Perry County Engineer
Eric Pflanz	City of Du Quoin
Jodi Schoen	Perry County Health Dept.
David Searby	Du Quoin ESDA
Joe Riggio	Du Quoin Fire Dept.
James Gielow	Pinckneyville Fire Dept.
Jeff Ashauer	Perry County Economic Development
Michael Ward	Du Quoin Police Dept.
William Place	Perry County EMA
Robert Spencer	USDA-NRCS
Randy Dement	Perry County 911
Sherry Werz	Marshall Browning Hospital
Jonathan Remo	SIUC
Megan Carlson	SIUC
John Buechler	Polis Center
Robert Clodi	Greater Egypt Regional Planning & Development Commission

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The meeting was called to order.

Robert Clodi thanked everyone for coming and distributed out in-kind forms to all the attending planning team members. He asked that each planning team member document the time spent reviewing the material on that form and return it to Greater Egypt Regional Planning Commission. Extra mitigation strategy handbooks were given to planning team members that were in need of one. Robert explained the 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, be specific about the location or focus area of a

strategy, in respects to being within a municipality or county wide. Lastly, he introduced John Buechler from the Polis Center.

John Beuchler began by briefly explaining the reason and process of the Multi-Hazard Mitigation Planning Project. After the new members of the planning team were brought up to current with the planning process the focus of the meeting began. The planning team listed new and current mitigation strategies, and then prioritized them.

Listed below are the New Mitigation Strategies conceived by the planning team:

New Strategy	Hazard	Jurisdiction	Priority Votes
Public Out Reach/Awareness	All	All	1
EMA Training	Hazmat, Earthquake	County	0
Hazmat Training	Hazmat	County	0
Fire Dept. Hazmat Equipment	Hazmat	Du Quoin	5
Designate Hazmat Routes and Install Signage	Hazmat	County	0
Secure Hydro-Ammonia Facility (add surveillance)	Hazmat	Pinckneyville	0
Reverse 911	All	All	0
ICE for Schools (text alert system)	All	All	0
Zoning Ordinance Amendment	Subsidence, Tornado	County	0
Generators for Critical Faculties	Winter Storms, Severe Weather, Tornadoes	All	10
Snow Fencing	Winter Storms	154 West of Pinckneyville, 150 North of Cutler, 154 East of Cutler, 152 East of 127	0
Snow Route Signage	Winter Storms	All	0
Identify All Shelters and Add Additional Shelters Where Needed	All	All	6
Stormwater System Management/Study	Flood	Du Quoin, Tamaroa, and Cutler	0
Stormwater Maintenance	Flood	Beaucoup Creek (County)	0
Voluntary Acquisition of Real Property	Flood	White Walnut, Mud Line Rd., Matthew Church Rd., E. Park St.	2
Road Elevation/Study	Flood	Ski and Pintail Rd. (County), Kimmel Rd. (County), Pick Rd. (County), E. Gordon Rd. (Pinckneyville), S. Washington St. (Du Quoin), Cudgetown Rd. (County), Beaucoup St. (Pinckneyville), Corgan Rd. (County), N. Hickory St. (Du Quoin), N. Oak St. (Cutler), W. Heatherton St. (Cutler), E. Mill St. (Cutler)	1

Flood Signage for Roads	Flood	Ski and Pintail Rd. (County), Kimmel Rd. (County), Pick Rd. (County), E. Gordon Rd. (Pinckneyville), S. Washington St. (Du Quoin), Cudgetown Rd. (County), Beaucoup St. (Pinckneyville), Corgan Rd. (County), N. Hickory St. (Du Quoin), N. Oak St. (Cutler), W. Heatherton St. (Cutler), E. Mill St. (Cutler)	0
Hardening Critical Facilities	All	All, Cutler Fire Station, Du Quoin High School	3
Mobile Water Filtration Vehicle	Earthquake	County	3
Potable Water Storage (backup)	Earthquake	County	2
Identify Potential Water Sources in Event of Rend Lake Potable Water System Failure	Earthquake	County	0
Courthouse and Jail Study to Harden or Sure-up Foundation	Earthquake	Pinckneyville/County	0
Bridge Study/Retro-fit	Earthquake	Route 51 Bridges (County)	1
Sirens	Tornado, Thunder Storms, Wind, Hail	All, Pinckneyville, Un-incorporated Communities	2
Weather Radio- Health Care, Special Needs, Daycare	All	All	0
Structural Study of the Grand Stands at the State Fair Grounds	Tornado	Du Quoin	0

Listed below are the Current Mitigation Strategies already being implemented throughout the County:

Current Strategies	Hazard	Jurisdiction
Hospital ICE (text alert system)	All	Du Quoin
Hospital HAM Radios	All	Du Quoin
1% Insurance Coverage (State Law)	Subsidence	County
GIS Mapping of Mines	Subsidence	County
Resource List of Critical Facilities and Equipment	Winter Storms	County
Tree Trimming (utilities)	Winter Storms, Severe Storms, Tornadoes	County
Flood Study Completed in Tamaroa	Flood	Tamaroa
Zoning Ordinance Adoption (no construction in the 100 yr. flood plain)	Flood	County
Flood Study Completed in Du Quoin	Flood	Du Quoin
New NFIP Under Development	Flood	County
Public Out Reach	All	All
Pinckneyville Sirens (triggers alarms in schools)	Tornado	Pinckneyville
Sheriff's Office (generator back-up)	All	Pinckneyville/County

Meeting was adjourned.

IEMA Pre-Disaster Mitigation Plan

Assembly of the Perry County Planning Team Meeting 5:

Chairman: William Place, Perry County Emergency Management Agency
Plan Directors: Greater Egypt Regional Planning & Development Commission, SIUC Geology Department, and IUPIU-Polis

Meeting Date: Thursday, April 9, 2009, at 9:30 am

Meeting Time: 1.30 hrs

Place: Du Quoin City Hall

Planning Team/Attendance:

Melvin Carrothers	Village of Cutler
Jim Epplin	Perry County Board
Doug Bishop	Perry County Engineer
Jodi Schoen	Perry County Health Dept.
David Searby	Du Quoin ESDA
James Gielow	Pinckneyville Fire Dept.
Jeff Ashauer	Perry County Economic Development
Robert Spencer	USDA-NRCS
Sherry Werz	Marshall Browning Hospital
Ted Hansa	Perry County EMA
John Stanhouse	Village of St. Johns
Jonathan Remo	SIUC
Robert Clodi	Greater Egypt Regional Planning & Development Commission
Ike Kirkikis	Greater Egypt Regional Planning & Development Commission

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The meeting was called to order.

Ike Kirkikis presented the planning team with the Final Draft of the Perry County Pre-Disaster Mitigation Plan and two maps that define and locate the critical facilities and hazards in Perry County. He called onto the planning team to voice any changes or correction to be made in the plan.

Narrative: The planning team made several suggestions about the content of the plan. Listed below are the changes and corrections that were addressed at the meeting.

Page(s)	Changes
6	**Correction** James Gielow, Organization – Pinckneyville Fire Dept. Jim Epplin, Title – County Board Melvin Corrother, Title – Village Clerk Michael A Ward, Title – Chief, Organization – Du Quoin Police Dept. , Jurisdiction – Du Quoin Michael Richmond, Title – Assistant, Organization – Perry County EMA, Jurisdiction – Perry County Tim O'Leary, Title – Superintendent **Addition** Ted Hansa, Title – Assistant, Organization - Perry County EMA, Jurisdiction - Perry County John C. Stanhouse, Title – President, Organization – St. Johnss, Jurisdiction – St. Johnss
10	**Correction** Rich Dial, Participation – Briefed on plan and provided comments **Addition** Jurisdiction – Du Quoin, Participating Member – Eric Pflanz, Participation Description – Briefed on plan and provided comments Jurisdiction – Pinckneyville, Participating Member – James Gielow, Participation Description – Member, MHMP planning committee Jurisdiction – Perry County, Participating Member – Jodi Schoen, Participation Description – Member, MHMP planning committee Jurisdiction – Pinckneyville, Participating Member – Michael Ward, Participation Description – Member, MHMP planning committee Jurisdiction – Perry County, Participating Member – Michael Richmond, Participation Description – Member, MHMP planning committee Jurisdiction – Pinckneyville, Participating Member – Mike Millikin, Participation Description – Member, MHMP planning committee Jurisdiction – Du Quoin, Participating Member – Raymond Clark, Participation Description – Member, MHMP planning committee Jurisdiction – Federal/Pinckneyville, Participating Member – Robert Spencer, Participation Description – Member, MHMP planning committee

	Jurisdiction – Perry County, Participating Member – Sherry Wertz, Participation Description – Member, MHMP planning committee Jurisdiction – Du Quoin, Participating Member – Stuart Swallers, Participation Description – Member, MHMP planning committee Jurisdiction – Pinckneyville, Participating Member – Tim O'Leary, Participation Description – Member, MHMP planning committee Jurisdiction – Perry County, Participating Member – Ted Hansa, Participation Description – Member, MHMP planning committee Jurisdiction – St. Johns, Participating Member – John Stanhouse, Participation Description – Member, MHMP planning committee
16	**Correction** Marshall Browning Hospital, Established – 1922 General Cable, Established – 1963 Pinckneyville Correctional Center, Established – 1998 Company Name - State of Illinois Police Company Name – Du Quoin Community Unit School District #300 Company Name – Pinckneyville School District #50
22	**Correction** Table 4-6, St Johns and Du Quoin Hazmat rank elevated to 2.
33	**Addition** Perry County Court to Table 4-15 **Correction** Table 4-14 Estimated Building Loss, Government loss needs to be recalculated to reflect an estimated total loss of the Perry County Court House – Estimated at $6,000,000
24	**Deletion** 1430788 from last paragraph of section 4.2.1.3 Facility Replacement Costs
81	**Check** Make sure the underground mining map is current.
86	**Addition** A list of references was left out. The following has been inserted at the end of Chapter four. **References:** National Climatic Data Center (NCDC). 2008. The Storm Events Database. http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms, last accessed

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Bauer, R.A. 2006. Mine Subsidence in Illinois: Facts for Homeowners, Circular 573, Illinois Department of Natural Resources and Illinois Geologic Survey, Springfield, Illinois. http://www.isgs.uiuc.edu/education/pdf-files/c573.pdf, last accessed, July 16, 2008.

Homan, J.D. 2001, Where did that come from? Sudden sinkhole causes several accidents on U.S. Route 51. http://thesouthern.com/articles/2001/12/26/top/export6747.prt, last accessed, July, 3, 2008.

Illinois Coal Association. 1992. Illinois coal facts: Springfield, Illinois, 64p.

Panno, S.V., Weibel, C.P., Li, W. 1997, Karst Regions of Illinois, Open File Series 1997-2. Illinois Geologic Survey, Champaign, Illinois, 42 p.

Pinter, N. 1993. Exercises in Active Tectonics: An Introduction to Earthquakes and Tectonic Geomorphology. Prentice Hall: Upper Saddle River, NJ.

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.

Tackett, M. 1990. Even the Kitchens Sink in Southern Illinois. Chicago Tribune. December 14, 1990.

United States Geologic Survey (USGS). 2008. Earthquake Hazards Program, Magnitude / Intensity Comparison. 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.

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88	**Deletion** Table 5-2 Pinckneyville, Building Standards – 12/4/2000 **Addition** Table 5-2 Perry County, Building Standards – 12/18/2007
89	**Deletion** First sentence, "Perry County uses the Illinois Capital Development Board's Building Code as its guide for building standards." Part of second sentence, "Pinckneyville adopted the National Building Code… " **Addition** The Perry County Zoning Ordinance states that all residential structures, except mobile homes, must adhere to the International Residential Code. This ordinance is exempt in communities that have a zoning ordinance, which includes Du Quoin, Tamaroa, and Willisville.
93	**Correction** Title "Table 5-4: Completed/Ongoing Mitigation Actions"
98	**Move** Mitigation Strategy: Clean drainage ditches and provide stream maintenance i.e. clear debris from the stream bed This strategy has been completed and should be listed in Table 5-4, page 93. **Correction** Comment: The USDA-NRCS and County Highway Dept. oversees the implementation of this project. It continues to be ongoing.
98	**Move** Mitigation Strategy: Amend the Zoning Ordinance to require tie-downs for mobile homes This strategy has been completed and should be listed in Table 5-4, page 93. **Correction** Mitigation Strategy: The Zoning Ordinance requires tie-downs for mobile homes Goal: Lessen the impact of hazards on loss of life and property Objective: Minimize the amount of residential life and property exposed to hazards Comment: The Perry County Zoning Ordinance requires mobile home tie-downs **Deletion** Jurisdiction Covered: Du Quoin, Tamaroa, and Willisville.

100	**Move** Mitigation Strategy: Revise Zoning Ordinance to protect the county against mine subsidence This strategy has been completed and should be listed in Table 5-4, page 93. **Correction** Mitigation Strategy: The Zoning Ordinances protects the county against mine operations Goal: To protect agriculture and residential land use from mining operations Objective: Require permits from IDNR and Perry County. Require performance bonds. For mining projects Comment: The Perry County Zoning Ordinances protects residents from mining operation by requiring minimal setback from existing residents and residential districts. Table 5-6, Implement a plan for voluntary buyouts for structures on White, Walnut Road, Mud Line, Matthews Church Road, East Park Street, Comments - The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the severity of the study. Table 4-19 presents potential buyout properties. Funding has not been secured, but additional funding will be sought from the Pre-Disaster Mitigation program. Implementation is forecasted to be initiated within approximately three years. **Deletion** Jurisdiction Covered: Du Quoin, Tamaroa, and Willisville.
115	**Correction** Current Strategies: Hospital HAM Radios
128	**Correction** <u>Police Station Facilities list</u> Pinckneyville Police Dept., Backup Power - Yes Perry County Sheriff's Dept., Backup Power - Yes Du Quoin Police Dept., Backup Power - Yes District 13 Headquarters – State Police, Backup Power – Yes <u>Fire Station Facilities list</u> Pinckneyville Fire Dept., Backup Power – Yes, Contact – James Gielow, Pinckneyville Rural Fire Protection Dist., Backup Power – Yes, Contact – James Gielow Du Quoin Fire Dept., Backup Power - Yes

	Potable Water Facilities list City of Pinckneyville WTP, Backup Power – Yes, Replacement Cost $6,000,000 **Addition** Potable Water Facilities list City of Cutler WTP 1, W. Mill St., Backup Power - Yes City of Cutler WTP 2, 5th St., Backup Power - Yes City of Cutler WTP 3, Old Kathleen Mine Well., Backup Power - No
129	**Addition** User Define list Perry County Court House, Address - 1 Public Square, Backup Power - No, City – Pinckneyville, Primary Function – Court House, Replacement $6,000,000 Perry County Health Dept., Address- 907 S. Main St., Backup Power – No, Primary Function – Public Health, Estimate - $2,000,000 **Correction** User Define list Pinckneyville Correctional Center, Backup Power – Yes Perry County Jail, Address – 12 E. Water St., Backup Power – Yes, Number of Beds - 55 Medical Care Facilities list Pinckneyville Community Hospital, Backup Power – Yes, Number of Beds - 25 Marshall Browning Hospital, Backup Power – Yes, Number of Beds - 25 Waste Water Facilities Cutler STP, Backup Power - Yes Du Quoin STP, Backup Power - Yes Pinckneyville STP 1, Backup Power - Yes Willsville STP, Backup Power - Yes
133	**Addition** Missing the data on Sirens
Appendix A	**Addition** Minutes from Perry County Meeting 5

Appendix B	**Addition** Newspaper Articles

Ike Kirkikis thanked everyone for coming and providing their input.

Meeting was adjourned.

Appendix B – Articles Published by Local Newspapers

Faculty to help 17 counties prepare for disaster

Project receives $1.3 million in federal funding

Allison Petty
Daily Egyptian

> **There is a real need in this area to look at what disasters can occur, have occurred in the past and . . . reduce the threat, should these things occur in the future.**
>
> — Nicolas Pinter, geology professor at SIU

Roughly $1.3 million in federal funds could help university faculty prepare southern Illinois for disaster.

Faculty members would work under a $1,288,000 grant to help 17 southern Illinois counties prepare for natural disasters, university officials announced Tuesday. The Federal Emergency Management Agency supplied the funding, which will last until 2010, said geology professor Nicholas Pinter.

"There is a real need in this area to look at what disasters can occur, have occurred in the past and … reduce the threat, should these things occur in the future," Pinter said.

He described the region as the "southern California of the Midwest," referencing a history of major floods, tornados and earthquakes in southern Illinois.

Pinter said he and other professors would collaborate with members of Indiana University-Purdue University Indianapolis and five Illinois regional planning commissions on the project.

Counties covered by the grant include Pulaski, Massac, Union, Johnson, Jackson, Williamson, Franklin, Jefferson, Perry, Gallatin, Edwards, White, Crawford, Bond, St. Clair and Clinton. The city of Cairo in Alexander County will also participate in the project.

Pinter said the grant would help officials meet federal requirements for disaster planning. He added that the funding would help pay for several students to help with the project.

Andy Flor is the first of these students.

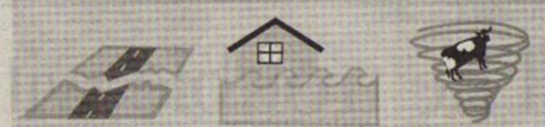
Flor, a graduate student from Flossmoor studying geology, said he would help gather and record data from the counties about their current emergency preparations.

Flor and other researchers will enter the data into a computer database, he said. Computer software helps develop more detailed planning and preparation for natural disasters.

> **You've got to go out and talk to the public. When we have a small tremor, public awareness is heightened and more people are interested in, 'Why are we having earthquakes? What does it mean potentially? Is it a threat, and what can we do about it?'**
>
> — Harvey Henson, geology professor at SIU

Southern Illinois natural disasters

New $1.3 million federal grant will allow university faculty to help 17 southern Illinois counties prepare for natural disasters.



New Madrid Earthquake of 1812
- Occurred in Missouri
- Ranked ninth-largest in the history of the United States
- Reached 7.9 magnitude level

Great Flood of 1993
- Caused $15 billion in damages
- Killed 50 people
- Covered nine states
- Remained in some areas for almost 200 days

Tri-State Tornado of 1925
- Affected 219 miles in Missouri, Illinois and Indiana
- Killed 695 people
- Injured 2,027 people
- Destroyed 15,000 homes

Source: National Weather Service

Michelle Arras ~ Daily Egyptian

"What we're really trying to do is inform communities where the flood plan is, what areas are going to be at risk, and you can plan around that," Flor said.

He added the project would focus on a variety of natural disasters.

"Floods are pretty obvious," Flor said. "In these counties they pose a big risk, but there's other things too — earthquakes, tornados."

Harvey Henson, a geology professor, said he has studied earthquakes for the past 22 years.

Under the grant, he said, it would be possible to raise a greater awareness about earthquakes.

"You've got to go out and talk to the public," Henson said. "When we have a small tremor, public awareness is heightened and more people are interested in, 'Why are we having earthquakes? What does it mean potentially? Is it a threat, and what can we do about it?'"

Henson said southern Illinois' position on the New Madrid Seismic Zone made it vulnerable to the possibility of a large quake.

"It's a backyard threat to southern Illinois," Henson said. "We have a small earthquake every so often which reminds us of that."

Allison Petty can be reached 536-3311 ext. 259 or allison.petty@siude.com.

D.E. 1/30/08

Daily Egyptian 1/30/08

Federal grant helps university lead 17-county disaster readiness effort

BY SCOTT FITZGERALD
THE SOUTHERN

CARBONDALE — Southern Illinois is not immune to natural disaster.

With help from the federal government and Southern Illinois University Carbondale researchers, however, the 17-county region in this part of the state can get a leg up on being prepared and reacting when flooding, earthquakes or other major disasters occur.

SIUC officials announced Tuesday during a news conference in the Student Center that Federal Emergency Management Agency is funding a $1.2 million cooperative effort of SIUC and five Illinois regional planning commissions in writing pre-disaster mitigation plans.

Hear the full news conference online at www.thesouthern.com.

FEMA requires and approves the plans that can open the door for more funding to help areas prepare for disaster.

"This grant from FEMA will help counties identify the risks they have and make plans to deal with any of those potential disasters," said Nicholas Pinter, a geology professor in SIUC's College of Science.

Pinter did not have a breakdown of the grant funding SIUC will share with colleagues from Indiana University-Purdue University Indianapolis' Polis Center who are assisting with the project and the five regional planning commissions.

Those commissions are: Southern Five Regional Planning Commission, Greater Egypt Regional Planning and Development Commission, Greater Wabash Regional Planning Commission and Southwestern Illinois Planning Commission.

"What's important is that the planning commissions would have to pay anywhere from $50,000 to $60,000 each to go out and hire

SEE GRANT / PAGE 7A

CHUCK NOVARA / THE SOUTHERN

Professor Nicholas Pinter walks from the podium after announcing SIUC will lead a $1.2 million emergency preparedness effort funded by the federal government.

1/30/08 S-1

GRANT: *Helps SIUC lead disaster readiness effort*

FROM PAGE 1

expertise to put together and write their mitigation plans. Under this arrangement, we're providing the expertise for free," Pinter said.

Pinter said he will hire another full-time staff person and several graduate students to work on the effort through 2010.

The money is administered through the Illinois Emergency Management Agency.

Andy Flor, a second-year graduate student in geology at SIUC, said the field work will consist of identifying areas that are prone to disasters and passing that information along to the planning commissions.

His graduate thesis, "Levee Safety, Levee Failure," identifies weak levee structures along the Mississippi in Southern Illinois, such as those structures near Grand Tower in Jackson County.

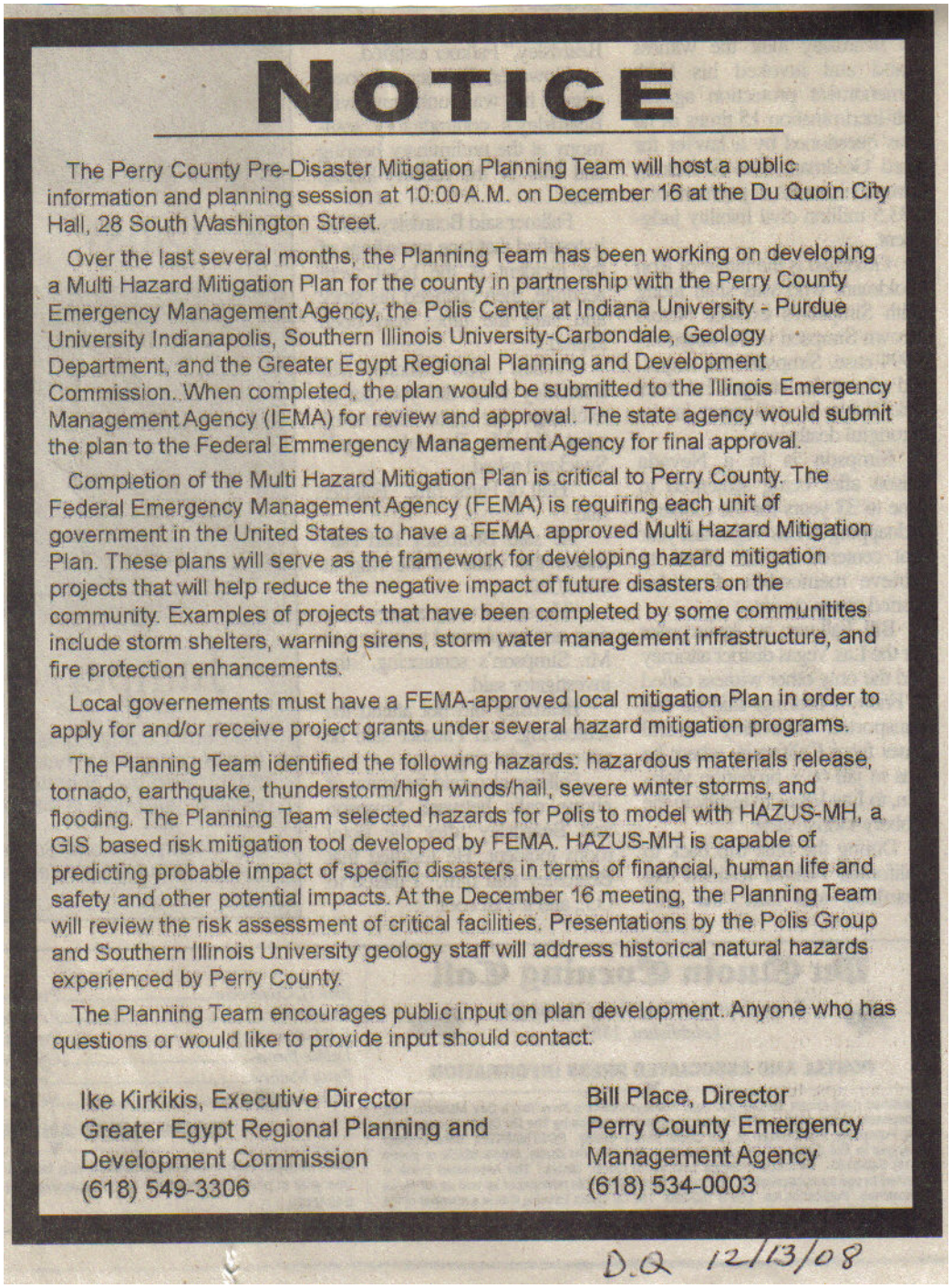
Grand Tower Levee District Commissioner Shawn McMahan said in April that high waters from the great flood of 1993 took their toll on the levee infrastructures.

About 17.5 miles of sliding levee needs to be stabilized and 75 locking structures need repair or replacement, McMahan said.

The local levee district's $15,000 annual budget collected from property taxes hardly meets the task at hand, said McMahan, who has sought federal assistance for many years.

scott.fitzgerald@thesouthern.com / 351-5076

The Southern Illinoisan 1/30/08



NOTICE

The Perry County Pre-Disaster Mitigation Planning Team will host a public information and planning session at 10:00 A.M. on December 16 at the Du Quoin City Hall, 28 South Washington Street.

Over the last several months, the Planning Team has been working on developing a Multi Hazard Mitigation Plan for the county in partnership with the Perry County Emergency Management Agency, the Polis Center at Indiana University - Purdue University Indianapolis, Southern Illinois University-Carbondale, Geology Department, and the Greater Egypt Regional Planning and Development Commission. When completed, the plan would be submitted to the Illinois Emergency Management Agency (IEMA) for review and approval. The state agency would submit the plan to the Federal Emmergency Management Agency for final approval.

Completion of the Multi Hazard Mitigation Plan is critical to Perry County. The Federal Emergency Management Agency (FEMA) is requiring each unit of government in the United States to have a FEMA approved Multi Hazard Mitigation Plan. These plans will serve as the framework for developing hazard mitigation projects that will help reduce the negative impact of future disasters on the community. Examples of projects that have been completed by some communitites include storm shelters, warning sirens, storm water management infrastructure, and fire protection enhancements.

Local governements must have a FEMA-approved local mitigation Plan in order to apply for and/or receive project grants under several hazard mitigation programs.

The Planning Team identified the following hazards: hazardous materials release, tornado, earthquake, thunderstorm/high winds/hail, severe winter storms, and flooding. The Planning Team selected hazards for Polis to model with HAZUS-MH, a GIS based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting probable impact of specific disasters in terms of financial, human life and safety and other potential impacts. At the December 16 meeting, the Planning Team will review the risk assessment of critical facilities. Presentations by the Polis Group and Southern Illinois University geology staff will address historical natural hazards experienced by Perry County.

The Planning Team encourages public input on plan development. Anyone who has questions or would like to provide input should contact:

Ike Kirkikis, Executive Director
Greater Egypt Regional Planning and
Development Commission
(618) 549-3306

Bill Place, Director
Perry County Emergency
Management Agency
(618) 534-0003

D.Q 12/13/08

Du Quoin Evening Call 12/13/08

4-6-2009

PUBLIC NOTICE

The Perry County Pre-Disaster Mitigation Planning Team will host a public information and planning session at 9:30 a.m. on April 9, 2009 at the Du Quoin City Hall, 29 South Washington Street.

Over the last several months, the Planning Team has been working on developing a Multi Hazard Mitigation Plan for the county in partnership with the Perry County Emergency Management Agency, the Polls Center at Indiana University - Prude University Indianapolis, Southern Illinois University - Carbondale, Geology Department, and the Greater Egypt Regional Planning and Development Commission. When completed, the plan would be submitted to the Illinois Emergency Management Agency (FEMA) for review and approval. The state agency would submit the plan to the Federal Emergency Management Agency for final approval.

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Perry County Emergency Management Agency
(618) 534-0003

Du Quoin Evening Call
4/6/2009

Perry Co.Pre-Disaster Mitigation Meeting

■ All Invited to Thursday Meeting at Du Quoin City Hall

The Perry County Pre-Disaster Mitigation Planning Team will host final planning session at 9:30 A.M. on April 9 at the Du Quoin City Hall located at 28 S. Washington, Du Quoin, IL.

The Planning Team has been working several months on the development of this Plan with the assistance of SIU-C and other groups. The Plan identified potential natural hazards for Perry County and proposed mitigation measures that are intended to reduce or eliminate the negative impact of a particular hazard.

Completion of the plan is critical to Perry County and its incorporated communities. FEMA requires each unit of government to have a FEMA-approved plan to be eligible for its Mitigation Grant Programs. The County-wide plan serves as an umbrella for all communities. Public participation is vital to the development of the plan.

The Planning Team encourages public input on the plan development. Anyone who has question or would like to provide input should contact Ike Kirkikis, Executive Director of the Greater Egypt Regional Planning and Development Commission at (618) 549-3306.

Du Quoin Evening Call
4/7/09

Appendix C – Adoption Resolution

Appendix D – Perry County Historical Hazards

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BLISTERING HEAT WAVE EXPECTED TO CONTINUE
Monday, August 13, 2008
http://www.thesouthern.com/articles/2007/08/13/top/21153871.txt

Fire

TRAILOR FIRE IN DU QUOIN
January 9, 2009
http://www.duquoin.com/news/x1621241375/Trailor-Fire-in-Du-Quoin

The site of historic Galum Presbyterian Church in rural Pinckneyville Tuesday morning.
CHRUCH BURNING LEADS TO SLASHED THROAT FOR PINCKNEYVILLE MAN, ARRESTS FOR TWO OTHERS
Monday, July 11, 2005
http://www.thesouthern.com/articles/2005/07/13/top/105100.txt

Hazardous Material

RESIDENTS STILL DISPLACED: CAUSE OF TRAIN DERAILMENT IN TAMAROA STILL A MYSTERY
Sunday, February 9, 2003
http://www.thesouthern.com/articles/2003/02/11/top/export14585.txt

Thunderstorms/ High Winds/ Hall/ Lightning

Tree down on power lines in Keyes City Park in Du Quoin, IL. This was a familiar sight in many counties. July 21, 2008. Photo provided by: Jeff Profitt and http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=pah&storyid=14448&source=0

STORM CAUSES DAMAGE IN ZEIGLER
Friday, August 11, 2006
http://www.southernillinoisian.com/articles/2006/08/11/top/17203677.txt

STORMS BATTER REGION: POSSIABLE TORNADO SIGHTED; RAIN, HAIL CAUSE DAMAGE
Wednesday, November 10, 2004
http://www.thesouthern.com/articles/2004/05/27/top/export23692.txt

PRESIDENT DECLARES 30 LOCAL COUNTIES DISASTER
On April 21, 2002 tornadoes, thunderstorms and damaging winds caused damage to 30 counties in Southern Illinois.
http://thesouthern.com/articles/2002/05/22/top/export9433.prt

Tornado

STORMS RIP INTO REGION AGAIN: RANDOLPH, PERRY COUNTIES HIT WITH MORE SEVERE WEATHER
Sunday, April 2, 2006
http://www.thesouthern.com/articles/2006/04/04/top/doc44325ef57facb616642640.txt

"Preliminary reports from the National Weather Service indicate Randolph and Perry counties were both walloped with at least an F1 or F2 tornado that originated in St. Genevieve County, MO, Saturday evening." March 11, 2006. Photo provided by: The Southern

May 31, 2001 Tornado in Pinckneyville, IL. Photo Courtesy
http://www.crh.noaa.gov/pah/storm/perrytor.php

Winter Storms

ICE AND SNOW HIT REGION HARD
Monday, February 11, 2008
http://www.thesouthern.com/articles/2008/02/12/front_page/23332915.txt

ICE, SNOW STRKE AGAIN
Wednesday, March 5, 2008
http://www.thesouthern.com/articles/2008/03/05/front_page/23618562.txt

"Local residents of Southern Illinois enjoyed a white Christmas in 2004. The winter storm brought up to 10 inches of snow in parts of Southern Illinois. "Perry, Jefferson, Gallatin, Pope, Hardin, Alexander and Massac counties all measured at between 3 to 5 inches by late morning." The picture is of Carbondale residents clearing snow." December 22, 2004. Photo provided by: The Southern

SNOWED UNDER: REGION CLEANING UP AFTER ROUNDS OF SNOWSTORMS
Wednesday, December 22, 2004
http://www.thesouthern.com/articles/2004/12/23/top/doc41ca4ef75fd98399413877.txt

Appendix E – Hazard Map

Appendix F – Complete List of Critical Facilities

Oil Facilities

Facility Name	Address	Back-up Power	City	Replacement Cost ($1,000)	Telephone Number
HICKS OIL IND DIVISION	845 N HICKORY ST	No	DU QUOIN		6185425431
TWIN COUNTY SERV. (F.S.)	510 W KASKASKIA ST	No	PINCKNEYVILLE		

Potable Water Facilities

Facility Name	Address	Back-up Power	City	Replacement Cost ($1,000)
CITY OF PINCKNEYVILLE WTP	WATER WORKS ROAD	Yes	PINCKNEYVILLE	6,000
Village of Cutler WTP 1	W. Mill St.	Yes	Cutler	
Village of Cutler WTP 2	5th St.	Yes	Cutler	
Village of Cutler WTP 3	Old Kathleen Mine Well	No	Cutler	

Airport Facilities

Facility Name	Back-up Power	City	Facility Owner	Latitude	Longitude	Primary Function	Replacement Cost ($1,000)
HEPP	No	CUTLER	Private	38.0337	-89.5793	Private	6049.5
HEMMER RLA	No	DU QUOIN	Private	37.9778	-89.2029	Private	6049.5
SCHUMAIER RLA	No	PINCKNEYVILLE	Private	38.1258	-89.4639	Private	6049.5
LAMBERT	No	PINCKNEYVILLE	Private	38.0862	-89.4590	Private	6049.5
PINCKNEYVILLE-DU QUOIN	No	PINCKNEYVILLE	Public	37.9779	-89.3605	Public	6049.5
PANTHER FIELD	No	PINCKNEYVILLE	Private	38.0639	-89.3878	Private	6049.5

EOC Facilities

Facility Name	Address	Back-up Power	City	Contact Person	Replacement Cost ($1,000)	Telephone Number
Pinckneyville Emergency Svc	104 S Walnut St	No	Pinckneyville	William Place	1110	6183578231
Du Quoin Emergency Operation Center	900 N Divison St	No	Du Quoin	David Searby	1110	

Railway Bridges

Bridge Name	Daily Traffic (cars/day)	Flood Structure Foundation Type	Latitude	Longitude	Maximum Span Length (m)	Replacement Cost ($1,000)	Structure Type	Total Bridge Length (m)	Year Built (Between 1500 and 2100)
ICG RR	6300	4	38.0703	-89.3807	21.9	79.92	30300002	24	1940
MO PAC RR	29	4	38.0672	-89.4489	4	76.59	70200009	23	1900
ICG RR	29	4	38.0900	-89.4096	5.8	23.31	30200009	7	1900
ICG RR	100	4	38.2030	-89.1711	6.4	103.23	30200009	31	1900
ICG RR	7200	4	38.0816	-89.3981	15.8	56.61	30300002	17	1938

Police Station Facilities

Facility Name	Address	Back-up Power	City	Contact Person	Replacement Cost ($1,000)	Telephone Number	Year Built
Pinckneyville Police Dept	104 S Walnut St	Yes	Pinckneyville	John Griffin	1554	6183578231	
Perry County Sheriff's Office	12 E Water St	Yes	Pinckneyville	Keith Kellerman	1554	6183575212	
Du Quoin Police Dept	28 S Washington St	Yes	Du Quoin	Michael Ward	1554	6185422131	
District 13 Headquarters - State Police	1391 S Washington St	Yes	Du Quoin	State Police	4000	6185422171	2005

Fire Stations

Facility Name	Address	Back-up Power	City	Contact Person	Number of Stories	Replacement Cost ($1,000)	Telephone Number
Tamaroa Fire Protection Distr	City Hall	No	Du Quoin	Fire Departments	1	666	
Tamaroa Fire Dept	PO Box 78	No	Tamaroa	Fire Departments	1	666	
Cutler Fire Protection District	Route 150	No	Cutler	David McDonald	1	812	6184972042
Du Quoin Fire Department	30 South Division Street	Yes	Du Quoin	Buddy Crain	1	812	6185425600
Pinckneyville Fire Department	110 South Walnut	Yes	Pinckneyville	James Gielow	1	406	6183572281
Tamaroa Fire Protection District	11 East Water Street	No	Tamaroa	Richard Valentine	1	812	6184963636
Willisville Fire Department	407 Peach Street	No	Willisville	Alan Arndt	1	812	6184978040
Pinckneyville Rural Fire Protection Dist	110 South Walnut	Yes	Pinckneyville	James Gielow	1	406	6183572281
Du Quoin Fire Department Station 2	US51 & S Fair Gate Road	No	Du Quoin	Buddy Crain	1	812	6185425600

Waste Water Facilities

Facility Name	Address	Back-up Power	City	Replacement Cost ($1,000)
CUTLER STP	P.O. BOX 88	Yes	CUTLER	73926
DUQUOIN SEWAGE TREATMENT PLANT	896 EAST COLE STREET	Yes	DU QUOIN	73926
PINCKNEYVILLE EAST STP	104 SOUTH WALNUT STREET	Yes	PINCKNEYVILLE	73926
PINCKNEYVILLE STP #1	332 WATER WORKS ROAD	Yes	PINCKNEYVILLE	73926
TAMAROA STP	P.O. BOX 216	No	TAMAROA	73926
WILLISVILLE STP	VILLAGE HALL	Yes	WILLISVILLE	73926

User Define

Facility Name	Address	Backup Power	City	Latitude	Longitude	Number of Beds	Primary Function	Replacement Cost ($1,000)
PICKNEYVILLE CORRECTIONAL CENTER	5835 State Route 154	Yes	Pinckneyville	38.5976	-89.1939	437	Correctional Center	555
PERRY COUNT JAIL	12 E Water St.	Yes	Pinckneyville	38.4471	-89.2252	55	JAIL	
Perry County Court House	1 Public Square	No	Pinckneyville				Court House	6,000
Perry County Health Dept.	907 S. Main St.	No	Pinckneyville				Public Health	2,000

Electric Power Facilities

Name	Address	City	Latitude	Longitude	Number of Stories	Replacement Cost ($1,000)	Year Built (Between 1500 and 2100)
SIEMENS (AMEREN) PLANT	White Walnut RD	Pinckneyville	38.1128	-89.3465	1		2001

Medical Care Facilities

Facility Name	Address	Back-up Power	City	Number of Beds	Primary Function	Replacement Cost ($1,000)	Telephone Number
PINCKNEYVILLE COMMUNITY HOSPITAL	101 NORTH WALNUT STREET	Yes	PINCKNEYVILLE	25	CRITICAL A	13500	6183678712
MARSHALL BROWNING HOSPITAL	900 NO.WASHINGTON ST. P.O. BOX 192	Yes	DU QUOIN	25	CRITICAL A	13500	6185422146

Rail Facilities

Facility City	Address	Back-up Power	Facility Name	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function	Replacement Cost ($1,000)
DU QUOIN	20 N. CHESTNUT ST.	No	DU QUOIN	Amtrak	38.0184	-89.2399	Amtrak Station	Passengers	2419.8
ST. JOHNS	within village limits	No	ST.JOHNS	Canadian National	38.0379	-89.2407	Cutting Yard	Cargo	
PINCKNEYVILLE	Switching yard	No	PINCKNEYVILLE	Canadian National	38.0779	-89.3966	Switching Yard	Cargo	
TARRAROA	Switching yard	No	TARRAROA	Canadian National	38.1358	-89.2289	Switching Yard	Cargo	

Hazardous Materials Facilities

Facility Name	Address	CAS Registry Number	Chemical Name	Chemical Quality (lbs.)	City	Contact Person	EPA ID	Latitude	Longitude	Standard Industrial Code	Replacement Cost ($1,000)
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	98862	ACETOPHENONE	4	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	7440360	ANTIMONY	4	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	7440508	COPPER	7	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	1163195	DECABROMODIPHENYL OX	5	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	7439921	LEAD	5	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
BICCGENERAL CABLE INDS. INC.	1453 S. WASHINGTON ST.	N982	ZINC COMPOUNDS	5	DU QUOIN	KEITH MCLAIN	ILT180011298	37.9825	-89.2353	3357	
"HICKS OILS, DUQUOIN"	MILLER & HICKORY ST.	N982	ZINC COMPOUNDS	0	DU QUOIN			38.0169	-89.2372	2992	

School Facilities

Facility Name	Address	Back-up Power	City	Contact Person	Number of Stories	Number of Students	Phone Number	Replacement Cost ($1,000)	Year Built (Between 1500 and 2100)
ST BRUNO CATHOLIC SCHOOL	210 N. GORDON STREET	No	PINCKNEYVILLE	Kevin Spiller	2	140	6183578276	555	
SACRED HEART PRE-K SCHOOL	110 WEST MAIN STREET	No	DU QUOIN		2	60	6185422335	555	1892
PINCKNEYVILLE CHRISTIAN ACAD	310 SOUTH FIRST STREET	No	PINCKNEYVILLE			14	6183575191	555	
CHRISTIAN FELLOWSHIP SCHOOL	616 S U.S. RT 51	No	DU QUOIN	Larry Bullock		119	6185426800	555	
PINCKNEYVILLE ELEM SCHOOL	301 W MULBERRY ST	No	PINCKNEYVILLE	Scott Wagner	1	324	6183575161	555	
PINCKNEYVILLE JUNIOR HIGH	700 E WATER ST	No	PINCKNEYVILLE	Ryan Swan	1	249	6183572724	6169	1970
TRI-COUNTY WARD	120 SPRING ST	No	DU QUOIN			79	6185425954	2173	1963
DUQUOIN HIGH SCHOOL	500 E SOUTH ST	No	DU QUOIN	Lybrand Beard	1	450	6185424744	16497	1955
DUQUOIN MIDDLE SCHOOL	845 E JACKSON ST	No	DU QUOIN	Aaron Hill	1	428	6185422646	17676	1999
DUQUOIN ELEMENTARY SCHOOL	845 E JACKSON ST	No	DU QUOIN		1	579	6185423295	555	1999
COMMUNITY CONS SCHOOL	6067 STATE RTE 154	No	PINCKNEYVILLE	Chris Rigdon		204	6183572419	555	
PINCKNEYVILLE COMM HIGH SCHOOL	600 E WATER ST	No	PINCKNEYVILLE	Jon Green		499	6183575013	17000	1930
DQ THEOBALD GYM	FRANKLIN ST	No	DU QUOIN					1650	1963
TAMAROA ELEMENTARY SCHOOL	200 W MAIN ST	No	TAMAROA		2	129	6184965513	1000	1904

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WNSR232	120 S WALNUT	CBR	No	DU QUOIN	DU QUOIN LEASED HOUSING C	38.0117	-89.2429		
WNSR232	200 E RANDOLPH	CBR	No	PINCKNEYVILLE	DU QUOIN LEASED HOUSING C	38.0798	-89.3379		
WNSR232		CBR	No	DU QUOIN	DU QUOIN LEASED HOUSING C	38.0117	-89.2429		
KNNQ712	304 E POPLAR ST	CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0103	-89.2359		
KNNQ712		CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0103	-89.2359		
WPLX430	900 N DIVISION ST	CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0253	-89.2387		
WPLX430		CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0253	-89.2387		
WPMV707	1118 NW STREET	CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0231	-89.2520		
WPMV707		CBR	No	DU QUOIN	DU QUOIN, CITY OF	38.0231	-89.2520		
WPPU988	900 NORTH DIVISION ST	CBR	No	DUQUOIN	DUQUOIN, CITY OF	38.0253	-89.2387		
WPPU988		CBR	No	DUQUOIN	DUQUOIN, CITY OF	38.0253	-89.2387		
WPCW750	1520 SHENANDOAH RD	CBR	No	PINCKNEYVILLE	EPPLIN, ROBERT E	38.0828	-89.4006		
WPCW750		CBR	No	PINCKNEYVILLE	EPPLIN, ROBERT E	38.0828	-89.4006		
WQAP278		CBR	No	DUQUOIN	GENERAL CABLE	37.9827	-89.2351		
WQBD694	1453 S WASHINGTON ST	CBR	No	DU QUOIN	GENERAL CABLE	37.9826	-89.2351		
WQBD694		CBR	No	DU QUOIN	GENERAL CABLE	37.9826	-89.2351		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WNVI477	228 W NORTH ST	CBR	No	DUQUOIN	GENESIO REFRIGERATION INC	38.0156	-89.2351		
WNVI477		CBR	No	DUQUOIN	GENESIO REFRIGERATION INC	38.0156	-89.2351		
KB78428	Standpipe-0.25 mi E of junction Bluebird	CBR	No	Tamaroa	GREENWOOD CREEK NATION	38.1253	-89.1619		
KZX572	1 1/2 MI S OF WINKLE IL RR 3	CBR	No	PINCKNEYVILLE	GREER, DONALD J	38.1231	-89.4843		
KZX572	RICE RD 2 MI NE RR1	CBR	No	SWANWICH	GREER, DONALD J	38.1367	-89.5181		
KZX572		CBR	No	PINCKNEYVILLE	GREER, DONALD J	38.1231	-89.4843		
WPQA612		CBR	No		GS METALS	38.0792	-89.3806		
WPHF218		CBR	No		HARDEES FOOD SYSTEMS INC	38.0009	-89.2523		
WPHF218		CBR	No	DU QUOIN	HARDEES FOOD SYSTEMS INC	38.0009	-89.2523		
WPGC466	7 MI W 4 MI S	CBR	No	DU QUOIN	HARSY, C DENNIS	37.9612	-89.3384		
WPGC466		CBR	No	DU QUOIN	HARSY, C DENNIS	37.9612	-89.3384		
WPSQ406	6126 SUTTER ROAD	CBR	No	DUQUOIN	ILLINI ENERGY RESOURCES L	37.9583	-89.3167		
WPSQ406		CBR	No	DUQUOIN	ILLINI ENERGY RESOURCES L	37.9583	-89.3167		
WPZW681	ICR Microwave site .8 Mile East of Tamar	CBR	No	Tamaroa	Illinois Centrail Railroa	38.1411	-89.2083		
WPZW681		CBR	No	Tamaroa	Illinois Centrail Railroa	38.1411	-89.2083		
WQHI218	111 Oak St	CBR	No	Duquoin	Illinois Centrail Railroa	38.0102	-89.2395		
WQHI218		CBR	No	Duquoin	Illinois Centrail Railroa	38.0102	-89.2395		
KQU232	ICG RR MICROWAVE SITE .8 MI E	CBR	No	TAMAROA	ILLINOIS CENTRAL GULF RAI	38.1412	-89.2084		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPBI456	N SIDE ICRR TRACKS 1.4 MI SE	CBR	No	SWANICK	ILLINOIS CENTRAL RAILROAD	38.1623	-89.5117		
WPIA442	N SIDE ICRR TRACKS 2 KM SE	CBR	No	SWANWICK	ILLINOIS CENTRAL RAILROAD	38.1623	-89.5117		
KIS20	8 MI E	CBR	No	TAMAROA	ILLINOIS CENTRAL RAILROAD	38.1412	-89.2084		
WNTT295	0.8 MI E OF	CBR	No	TAMAROA	ILLINOIS CENTRAL RAILROAD	38.1411	-89.2084		
KSB234	US RT 51 AT S EDGE	CBR	No	DU QUOIN	ILLINOIS, STATE OF	37.9848	-89.2348		
KUY336	1/2 MI S RT 13	CBR	No	SWANWICK	ILLINOIS, STATE OF	38.1598	-89.5370		
WBH452	US RT 51 @ S CITY LIMITS	CBR	No	DU QUOIN	ILLINOIS, STATE OF	37.9848	-89.2348		
WPBR810	215 N HICKORY	CBR	No	DU QUOIN	ILLINOIS, STATE OF	38.0014	-89.2356		
WPCY547	DU QUOIN FAIRGROUNDS RR 1	CBR	No	DU QUOIN	ILLINOIS, STATE OF	38.0348	-89.2504		
WPDP735	DU QUOIN STATE FAIRGROUNDS	CBR	No	DU QUOIN	ILLINOIS, STATE OF	38.0278	-89.2293		
WPDP735		CBR	No	DU QUOIN	ILLINOIS, STATE OF	38.0278	-89.2293		
WPDP824	DU QUOIN FAIRGROUNDS RR 1	CBR	No	DU QUOIN	ILLINOIS, STATE OF	38.0348	-89.2504		
WPFF638	.5 MI S OF IL-13	CBR	No	SWANWICK	ILLINOIS, STATE OF	38.1598	-89.5370		
WPKZ959	PINCKNEYVILLE CORRECTIONAL CTR	CBR	No	PINCKNEYVILLE	ILLINOIS, STATE OF	38.0801	-89.3734		
WPMF515	PINCKNEYVILLE CORRECTIONAL CENTER	CBR	No	PINCKNEYVILLE	ILLINOIS, STATE OF	38.0801	-89.3734		
WPMF515		CBR	No	PINCKNEYVILLE	ILLINOIS, STATE OF	38.0801	-89.3734		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPQH609	GRANDSTAND, DUQUOIN STATE FAIRGROUNDS	CBR	No	DU QUOIN	ILLINOIS, STATE OF	37.9823	-89.2256		
WPQH609		CBR	No	DU QUOIN	ILLINOIS, STATE OF	37.9823	-89.2256		
WQDC380	US RT 51 @ S. CITY LIMITS	CBR	No	DUQUOIN	ILLINOIS, STATE OF	37.9847	-89.2347		
WQDC380		CBR	No	DUQUOIN	ILLINOIS, STATE OF	37.9847	-89.2347		
WQI377	PYRAMID STATE PK 6 MI SW	CBR	No	PINCKNEYVILLE	ILLINOIS, STATE OF	38.0062	-89.4168		
WBS688	RT 51 S EDGE	CBR	No	DUQUOIN	J W REYNOLDS MONUMENT COM	37.9951	-89.2326		
KNCL282	.7 MI W AND .9 MI N OF JCT RT 51 & RT 14	CBR	No	DU QUOIN	KRONE, RICK	37.9853	-89.2470		
KNCL282		CBR	No	DU QUOIN	KRONE, RICK	37.9853	-89.2470		
WPNS244	9576 CITY LAKE ROAD	CBR	No	DUQUOIN	MAJEWSKI, MIKE	38.0676	-89.1687		
WPNS244		CBR	No	DUQUOIN	MAJEWSKI, MIKE	38.0676	-89.1687		
WQEJ240		CBR	No	DuQuoin	Marshall Browning Hospita	38.0244	-89.2372		
WQIQ943	900 N WASHINGTON	CBR	No	DU QUOIN	MARSHALL BROWNING HOSPITA	38.0192	-89.2418		
WQIQ943		CBR	No	DU QUOIN	MARSHALL BROWNING HOSPITA	38.0192	-89.2418		
WPMB594	1.53 MI E OF THE INT OF ST RT 154/150 N	CBR	No	CUTLER	MAYER, JOHN	38.0887	-89.5279		
WPMB594		CBR	No	CUTLER	MAYER, JOHN	38.0887	-89.5279		
KNBJ268	1118 N WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
KNBJ268		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
KNJS830	12 E WATER ST	CBR	No	PINCKNEYVILLE	PERRY, COUNTY OF	38.0809	-89.3820		
KNJS830		CBR	No	PINCKNEYVILLE	PERRY, COUNTY OF	38.0809	-89.3820		
WPKJ493	1118 NORTH WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPKJ493		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPKU833	1118 N W ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPKU833		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPLS721	1118 N WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPLS721		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPLT252	1118 N WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPLT252		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPMB765	1118 N WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPMB765		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPNR261	1118 N WEST ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPNR261		CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0231	-89.2520		
WPQJ331	12 EAST WATER ST	CBR	No	PINCKNEYVILLE	PERRY, COUNTY OF	38.0809	-89.3820		
WPQJ331	304 EAST POPLAR ST	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0103	-89.2359		
WPQJ780	235 REESES HILL RD	CBR	No	CUTLER	PERRY, COUNTY OF	38.0437	-89.5867		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPQJ780	COR OF N HICKORY & SECOND STS	CBR	No	TAMAROA	PERRY, COUNTY OF	38.1328	-89.2184		
WPQJ780	COR OF MILL & MAIN STS	CBR	No	CUTLER	PERRY, COUNTY OF	38.0323	-89.5651		
WPQJ780	COR OF PEACH ROAD ST	CBR	No	WILLISVILLE	PERRY, COUNTY OF	37.9837	-89.5918		
WPQJ780	30 S DIVISION	CBR	No	DUQUOIN	PERRY, COUNTY OF	38.0103	-89.2390		
WPQJ780	110 S WALNUT ST	CBR	No	PINCKNEYVILLE	PERRY, COUNTY OF	38.0789	-89.3831		
WPRH418	235 REESES HILL RD	CBR	No	CUTLER	PERRY, COUNTY OF	38.0437	-89.5867		
WPRH418	COR OF N HICKORY & SECOND STS	CBR	No	TAMAROA	PERRY, COUNTY OF	38.1328	-89.2184		
WPRH418	12 E WATER ST	CBR	No	PINCKNEYVILLE	PERRY, COUNTY OF	38.0809	-89.3820		
WPRS328	12 EAST WATER STREET	CBR	No	PINCKNEYVILLE	Perry, County of	38.0808	-89.3819		
WPRS328	304 EAST POPLAR STREET	CBR	No	DUQUOIN	Perry, County of	38.0103	-89.2358		
WQDJ721		CBR	No	Pinckneyville	Pickneyville Community Ho	38.0810	-89.3828		
WNFI551	PINCKNEYVILLE JR HIGH SCHOOL RT 4 HWY 15	CBR	No	PINCKNEYVILLE	PICKNEYVILLE SCHOOL DIST	38.1006	-89.3912		
WNFI551		CBR	No	PINCKNEYVILLE	PICKNEYVILLE SCHOOL DIST	38.1006	-89.3912		
WPEH312	12 E WATER ST	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE AMBULANCE S	38.0809	-89.3820		
WPEH312	508 S MAIN ST	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE AMBULANCE S	38.0753	-89.3818		
WPEH312	403 PEACH STREET	CBR	No	WILLISVILLE	PINCKNEYVILLE AMBULANCE S	37.9822	-89.5917		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPEH312	COR OF 2ND N & HICKORY STS	CBR	No	TAMAROA	PINCKNEYVILLE AMBULANCE S	38.1392	-89.2312		
WPEH312	28 S WASHINGTON ST	CBR	No	DUQUOIN	PINCKNEYVILLE AMBULANCE S	38.0103	-89.2359		
WPEH312	900 N WASHINGTON ST	CBR	No	DUQUOIN	PINCKNEYVILLE AMBULANCE S	38.0256	-89.2362		
WPEH312		CBR	No	PINCKNEYVILLE	PINCKNEYVILLE AMBULANCE S	38.0809	-89.3820		
WPQB245		CBR	No		PINCKNEYVILLE COMMUNITY H	38.0803	-89.3820		
KNBW727	101 N WALNUT	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE COMMUNITY H	38.0812	-89.3840		
KNAU404	WATERWORKS RD WATER PLANT	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE, CITY OF	38.0864	-89.3798		
sirens		CDFLT	No	DUQUOIN		38.0166	-89.2406		sirens
sirens		CDFLT	No	DUQUOIN		38.0198	-89.2294		sirens
sirens		CDFLT	No	DUQUOIN		37.9983	-89.2342		sirens
sirens		CDFLT	No	DUQUOIN		37.9751	-89.2375		sirens
sirens		CDFLT	No	TAMAROA		38.1402	-89.2309		sirens
sirens		CDFLT	No	PINCKNEYVILLE		38.0825	-89.3329		sirens
sirens		CDFLT	No	PINCKNEYVILLE		38.0808	-89.3900		sirens
sirens		CDFLT	No	PINCKNEYVILLE		38.0752	-89.3880		sirens
sirens		CDFLT	No	CUTLER		38.0340	-89.5657		sirens
sirens		CDFLT	No	WILLISVILLE		37.9838	-89.5917		sirens
WSIU-TV CH 8		CBT	No	CARBONDALE	BD. OF TRUSTEES SOUTHERN	38.1042	-89.2437	4297 | TV | EDUCATIONAL TV STATION	TV
WDQN 1580		CBR	No	DUQUOIN	DUQUOIN B/CNG CO., A GENE	38.0323	-89.2418	17748	AM
WDQN-FM CH 240		CBR	No	DUQUOIN	DUQUOIN B/CNG CO., A GENE	38.0323	-89.2418	17749 | H | A	FM
WQCB332	4646 WHITE WALNUT RD	CBR	No	PINCKNEYVILLE	AMEREN SERVICES	38.1114	-89.3468		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WQCB332		CBR	No	PINCKNEYVILLE	AMEREN SERVICES	38.1114	-89.3468		
WNTW421	VARIOUS LOCATIONS	CBR	No	JAMESTOWN	Ameren Services Company	38.0497	-89.5270		
WPAR507	HWY 51 2 MI S	CBR	No	TAMAROA	Ameren Services Company	38.1031	-89.2445		
WQIU455	US RT 51 at S City Limits	CBR	No	Du Quoin	Ameren Services Company	37.9847	-89.2347		
WNQO293	2 3/4 MI E & 1 3/4 MI N OF INT ST RT 154	CBR	No	PINCKNEYVILLE	BAUERSACHS, KENNETH S	38.0912	-89.4937		
WNQO293		CBR	No	PINCKNEYVILLE	BAUERSACHS, KENNETH S	38.0912	-89.4937		
WPNF600	US HWY 51 2 MI S	CBR	No	TAMAROA	BOARD OF TRUSTEES OF SIU	38.1042	-89.2437		
WPXA203	2 MILES SOUTH OF TAMORA ON HIGHWAY 51	CBR	No	DUQUOIN	BOARD OF TRUSTEES OF SIU	38.1031	-89.2444		
WPXA206	2 MILES SOUTH OF TAMORA ON HIGHWAY 51	CBR	No	DUQUOIN	BOARD OF TRUSTEES OF SIU	38.1031	-89.2444		
KNKN477	RURAL ROUTE 3	CBR	No	PICKNEYVILLE	Cellco Partnership	38.0914	-89.4794		
WMS307	5.3 MI WEST	CBR	No	PINCKNEYVILLE	Cellco Partnership	38.0914	-89.4795		
WPOM587	369 US ROUTE 51	CBR	No	DU QUOIN	Cellco Partnership	37.9631	-89.2348		
WPQT339	SE CORNER MILLER & WEST ST	CBR	No	NORTH DUQUOIN	Cellco Partnership	38.0231	-89.2520		
KNKN477	RURAL ROUTE 3	CBR	No	PICKNEYVILLE	Cellco Partnership	38.0914	-89.4794		
KNKN477	RURAL ROUTE 3	CBR	No	PICKNEYVILLE	Cellco Partnership	38.0914	-89.4794		
WQI221	111 S CHESTNUT ST	CBR	No	DUQUOIN	Comcast of Indiana/Kentuc	38.0092	-89.2406		
WQI221		CBR	No	DUQUOIN	Comcast of Indiana/Kentuc	38.0092	-89.2406		
WLP88	APPROX 1 MI E ST 150 ON JAMESTOWN RD	CBR	No	JAMESTOWN	CONSOLIDATION COAL COMPAN	38.0173	-89.5309		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WNFQ831	1 MI E	CBR	No	CUTLER	CONSOLIDATION COAL COMPAN	38.0173	-89.5279		
WPHP377	15 SOUTH MULBERRY	CBR	No	DUQUOIN	DAVISON, MICHAEL	38.0092	-89.2376		
WPHP377		CBR	No	DUQUOIN	DAVISON, MICHAEL	38.0092	-89.2376		
WPVC493	302 EAST POPLAR STREET	CBR	No	DU QUOIN	DU QUOIN CITY OF	38.0104	-89.2360		
WPVC493		CBR	No	DU QUOIN	DU QUOIN CITY OF	38.0104	-89.2360		
KNAU404	104 S WALNUT ST CITY HALL	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE, CITY OF	38.0781	-89.3854		
KVP520	110 S WALNUT ST	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE, CITY OF	38.0781	-89.3854		
WPJM707	104 S WALNUT ST	CBR	No	PINCKNEYVILLE	PINCKNEYVILLE, CITY OF	38.0789	-89.3831		
WPJM707		CBR	No	PINCKNEYVILLE	PINCKNEYVILLE, CITY OF	38.0789	-89.3831		
WPKR729	101 N WALNUT	CBR	No	PINKNEYVILLE	PINKNEYVILLE COMMUNITY HO	38.0806	-89.5001		
WPKR729		CBR	No	PINKNEYVILLE	PINKNEYVILLE COMMUNITY HO	38.0806	-89.5001		
WNGQ299	3RD S & CHESTNUT STS	CBR	No	TAMAROA	PLACE, WILLIAM	38.1331	-89.2301		
WNGQ299		CBR	No	TAMAROA	PLACE, WILLIAM	38.1331	-89.2301		
WNXH495		CBR	No		RACING RADIOS INC	38.0417	-89.2167		
WQHV888	CORNER OF SOUTH GREENWOOD & IVY LANE	CBR	No	DUQUION	REND LAKE CONSERVANCY DIS	38.0053	-89.2158		
WPPU538	DU QUION TWR	CBR	No	DU QUOIN	REND LAKE INTERCITY WATER	38.0076	-89.2401		
WPDW663	2 MI NNE OF RT 1 BOX 235	CBR	No	SCHELLER	RESTOFF FARMS	38.1742	-89.1695		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPDW663	2 MI NNE OF RT 1 BOX 235A	CBR	No	SCHELLER	RESTOFF FARMS	38.1751	-89.1709		
WPDW663		CBR	No	SCHELLER	RESTOFF FARMS	38.1742	-89.1695		
KZB799	130 S WASHINGTON	CBR	No	DEQUOIN	SEARBY, DAVID	38.0081	-89.2354		
KZB799		CBR	No	DEQUOIN	SEARBY, DAVID	38.0081	-89.2354		
WPSF580	3RD AND CHESTNUT STREET	CBR	No	TAMAROA	Services Unlimited	38.1331	-89.2300		
WPSF580		CBR	No	TAMAROA	Services Unlimited	38.1331	-89.2300		
WBM520	5.5 MI NNE OF	CBR	No	VERGENNES	SOUTHERN ILLINOIS POWER C	37.9517	-89.3215		
WQDS732	Sutter Road and Highway 13/127	CBR	No	Vergennes	Southern Illinois Power C	37.9518	-89.3216		
KNKN506	PINCKNEYVILLE SITE-APPROX 6 MILES ENE OF	CBR	No	TAMAROA	Southern Illinois RSA Par	38.1167	-89.2801		
WQFH524	Route 2, Box 122, Duquoin, IL 62832	CBR	No	Elkville	Southern Illinois RSA Par	37.9739	-89.2353		
WPHY711	2 KM S OF PINCKNEYVILLE ON IL 13	CBR	No	PINCKNEYVILLE	State of Illinois Departm	38.0567	-89.3795		
WPKH463	COR OF N HICKORY 2ND N ST	CBR	No	TAMAROA	TAMAROA COMMUNITY FIRE PR	38.1328	-89.2184		
WPKH463		CBR	No	TAMAROA	TAMAROA COMMUNITY FIRE PR	38.1328	-89.2184		
KZT815	3.5 MI S ON RT 13 .25 MI E	CBR	No	PINCKNEYVILLE	TIMPNER BROTHERS FARMS	38.0053	-89.3670		
KZT815	3 MI S ON RT 13	CBR	No	PINCKNEYVILLE	TIMPNER BROTHERS FARMS	38.0289	-89.3701		
WIO46	600 KASKASKIE	CBR	No	PINCYNEYVILLE	TWIN CO SERVICE	38.0839	-89.3870		

Communication Facilities

Facility Name	Address	Analysis Class	Back-up Power	City	Facility Owner	Latitude	Longitude	Misc. Comments	Primary Function
WPKJ851	ON ST RT 154 2KM E	CBR	No	PINCKNEYVILLE	UNI DISTRIBUTION AND MANU	38.0823	-89.3443		
WPKJ851		CBR	No	PINCKNEYVILLE	UNI DISTRIBUTION AND MANU	38.0823	-89.3443		
WPLF744		CBR	No		UNI DISTRIBUTION AND MANU	38.0823	-89.3443		
KLE661	25 LOOKOUT STREET	CBR	No	PINCKNEYVILLE	UNION PACIFIC RAILROAD CO	38.0776	-89.3937		
WQCV479	MP 97.0, 3.18 MI EAST OF	CBR	No	PINCKNEYVILLE	Union Pacific Railroad Co	38.0930	-89.3257		
KTU425	SE COR OF MILLER AND WEST ST	CBR	No	DU QUOIN	Verizon North Inc.	38.0231	-89.2520		
WPJK796	3.5 MI E OF INT OF IL HWY 154 AND 51 RT	CBR	No	TAMAROA	WESTERN EGYPTIAN ECONOMIC	38.0845	-89.1873		
WPJK796		CBR	No	TAMAROA	WESTERN EGYPTIAN ECONOMIC	38.0845	-89.1873		
WNSB375	1/8 MI W INT STATE HWY 4 & SCHOOL ST	CBR	No	WILLISVILLE	WILLISVILLE, CITY OF	37.9823	-89.5918		
WNSB375		CBR	No	WILLISVILLE	WILLISVILLE, CITY OF	37.9823	-89.5918		
KPM264	US HWY 51 N	CBR	No	TAMAROA	WPXS, INC.	38.1042	-89.2437		

Highway Bridges

Bridge Name	Bridge Length (m)	Bridge Owner	Bridge Width (m)	Daily Traffic (cars/day)	Flood Structure Foundation Type	General Condition Rating	Latitude	Longitude	Maximum Span Length (m)	Number of Spans	Replacement Cost ($1,000)	Scour Index	Skew Angle (degrees)	Structure Type	Year Built (Between 1500 and 2100)
000073314406769	15	County Highway Agency	7	250	4	9	38.1124	-89.2014	15	1	336.15	8	0	505	1988
000073314526790	9	Town Highway Agency	7	125	4	8	38.1074	-89.4991	8	1	201.69	8	30	505	1991
000073314631353	13	Town Highway Agency	7	125	4	9	38.1538	-89.4345	12	1	291.33	8	0	505	1988
000073314815009	16	Town Highway Agency	7	25	4	9	38.1611	-89.5761	15	1	358.56	8	30	505	1988
000073314915613	19	County Highway Agency	8	1200	4	9	37.9749	-89.1944	19	1	425.79	8	0	505	1989
000073315023312	12	County Highway Agency	8	300	4	9	38.2006	-89.3485	11	1	268.92	8	0	505	1990
000073315126792	30	Town Highway Agency	7	175	4	8	38.1653	-89.3613	12	3	890.4	8	0	505	1991
000073315226808	8	Town Highway Agency	7	75	4	9	38.1499	-89.2183	8	1	179.28	8	0	505	1991
000073315430232	31	Town Highway Agency	7	50	4	9	37.9823	-89.4419	15	3	920.08	8	0	505	1992
000073315531354	7	Town Highway Agency	8	50	4	N	38.0019	-89.1956	7	1	156.87	8	0	107	1994
000073315631430	8	Town Highway Agency	7	50	4	9	38.0973	-89.1682	7	1	179.28	8	0	505	1994
000073315730438	25	Town Highway Agency	7	9	4	9	37.9875	-89.5026	24	1	742	8	0	505	1993
000073315830233	124	County Highway Agency	8	850	4	8	38.0224	-89.1402	20	6	3680.32	8	0	505	1993
000073315931363	11	Town Highway Agency	6	75	4	8	38.1384	-89.5320	10	1	246.51	8	0	122	1994
000073316031125	69	County Highway Agency	7	100	4	9	38.1801	-89.1545	20	4	2047.92	8	0	505	1994
000073316131355	19	Town Highway Agency	7	225	4	9	38.1184	-89.3152	19	1	425.79	8	0	505	1994
000073316231364	12	Town Highway Agency	7	225	4	9	38.1081	-89.3153	11	1	268.92	8	15	505	1994
000073316332340	13	County Highway Agency	8	850	4	9	38.0196	-89.1474	12	1	291.33	8	0	505	1997
000073316432678	37	Town Highway Agency	7	150	4	9	38.0259	-89.3473	18	3	1098.16	8	12	505	1997
000073316533184	19	Town Highway Agency	7	125	4	9	38.0234	-89.3340	18	1	425.79	8	20	505	1998
000073316633187	12	Town Highway Agency	7	150	4	9	38.0166	-89.3161	11	1	268.92	8	15	505	1999
000073316733413	15	Town Highway Agency	7	225	4	9	38.0125	-89.3204	14	1	336.15	8	0	505	1999
000073316833188	19	Town Highway Agency	7	25	4	9	38.1989	-89.1722	18	1	425.79	8	20	505	1999
000073316931356	15	Town Highway Agency	7	175	4	9	38.1591	-89.4219	15	1	336.15	8	0	505	1993
000073317136534	20	Town Highway Agency	7	250	4	9	38.1583	-89.3328	19	1	593.6	8	25	505	2003
000073317236312	22	Town Highway Agency	7	125	4	9	38.1417	-89.2717	21	1	652.96	8	0	505	2002
000073317536539	13	Town Highway Agency	7	25	4	9	38.0976	-89.2088	12	1	291.33	8	38	505	2003
000073317638672	12	Town Highway Agency	7	50	4	9	38.2107	-89.3661	11	1	268.92	8	0	505	2005
000073317934045	21	Town Highway Agency	7	25	4	9	38.1341	-89.3477	20	1	623.28	8	0	505	2004
000073500016661	12	County Highway Agency	0	300	4	N	38.1733	-89.2821	3	3	268.92	8	0	119	1953
000073500116670	8	County Highway Agency	9	125	4	N	38.1870	-89.4253	4	2	179.28	8	20	119	1900
000073500204019	6	Town Highway Agency	7	100	4	N	38.0407	-89.3392	3	2	134.46	8	20	119	1980
000073500400607	7	Town Highway Agency	8	150	4	N	38.0694	-89.4043	3	2	156.87	8	45	119	1920
000073500507960	11	Town Highway Agency	7	100	4	N	38.1588	-89.1857	4	3	246.51	8	20	119	1984
000073500614769	11	Town Highway Agency	7	100	4	N	38.1623	-89.1855	4	3	246.51	8	0	119	1984
000073500714744	12	Town Highway Agency	7	375	4	N	38.0545	-89.3903	4	3	268.92	8	0	119	1984
000073990725618	34	Private	10	2400	4	2	38.0020	-89.3150	12	3	1005.38	N	0	505	1970
000082620031424	14	City Highway Agency	10	1800	4	5	38.1481	-89.4084	12	1	313.74	5	0	104	1948
000073003332267	245	Other Federal Agencies	0	500	4		38.0101	-89.2402	19	0	9898		0	602	1997
000073003332267	245	Other Federal Agencies	0	300	4		38.0101	-89.2402	19	0	9898		0	602	1997
000073990024691	23	Other Federal Agencies	0	6300	4		38.0701	-89.3805	21	0	799.48		0	303	1940
000073990124692	22	Other Federal Agencies	0	25	4		38.0674	-89.4490	4	0	678.26		0	702	1900
000073990324694	6	Other Federal Agencies	0	250	4		38.0897	-89.4090	5	0	130.98		0	302	1900
000073990424695	31	Other Federal Agencies	0	25	4		38.2028	-89.1707	6	0	1077.56		0	302	1900
000073990524690	17	Other Federal Agencies	0	7400	4		38.0813	-89.3973	15	0	371.11		0	303	1938
000028001506814	43	State Highway Agency	10	3600	4	4	37.9759	-89.1540	15	3	2054.97	5	0	402	1955
000073000316632	7	State Highway Agency	12	8200	4	6	37.9675	-89.2337	7	1	156.87	5	0	101	1921
000073001016638	159	State Highway Agency	10	3300	4	8	37.9677	-89.3526	18	10	6037.23	5	0	602	1926
000073001316641	41	State Highway Agency	10	3600	4	7	37.9759	-89.1679	15	3	1959.39	5	0	402	1955
000073001516644	126	State Highway Agency	10	7800	4	7	38.0802	-89.3691	22	6	6021.54	8	30	402	1962
000073001616645	8	State Highway Agency	12	4700	4	4	38.0827	-89.3039	8	1	179.28	5	0	101	1927

Highway Bridges

Bridge Name	Bridge Length (m)	Bridge Owner	Bridge Width (m)	Daily Traffic (cars/day)	Flood Structure Foundation Type	General Condition Rating	Latitude	Longitude	Maximum Span Length (m)	Number of Spans	Replacement Cost ($1,000)	Scour Index	Skew Angle (degrees)	Structure Type	Year Built (Between 1500 and 2100)
000073002116650	10	State Highway Agency	13	3650	4	5	38.0916	-89.3830	9	1	224.1	5	0	107	1936
000073002316677	178	State Highway Agency	10	2400	4	8	38.0028	-89.3458	16	11	8506.62	7	0	402	1927
000073002416678	48	State Highway Agency	10	2400	4	4	38.0026	-89.3353	21	3	1419.36	5	0	505	1927
000073002523939	44	State Highway Agency	14	3650	4	8	38.1537	-89.3854	16	3	2102.76	8	0	402	1976
000073002623938	72	State Highway Agency	14	3650	4	7	38.1559	-89.3836	19	4	3440.88	5	0	402	1976
000073002700081	25	State Highway Agency	10	2750	4	4	38.0829	-89.2198	12	2	739.25	8	0	505	1985
000073002830059	30	State Highway Agency	10	2700	4	7	38.0870	-89.5541	29	1	693.9	8	20	302	1992
000073002930060	25	State Highway Agency	10	2700	4	8	38.0862	-89.5147	25	1	578.25	8	0	302	1992
000073003030061	23	State Highway Agency	10	2650	4	8	38.0804	-89.4350	22	1	531.99	8	15	302	1992
000073003132998	22	State Highway Agency	11	3350	4	8	37.9526	-89.3333	21	1	652.96	8	0	502	2000
000073003232999	36	State Highway Agency	13	5300	4	9	38.0437	-89.3785	17	2	832.68	8	0	302	2001
000073003332267	245	State Highway Agency	10	6200	4	8	38.0101	-89.2402	19	15	9898	N	0	602	1997
000073003433000	36	State Highway Agency	12	4700	4	8	38.0828	-89.2653	12	3	1068.48	8	30	502	2001
000073003533722	33	State Highway Agency	11	2750	4	7	38.0827	-89.1617	12	3	1044.45	8	10	102	2002
000073200016642	11	State Highway Agency	0	3600	4	N	37.9759	-89.1561	3	3	246.51	8	0	219	1955
000073200229203	6	State Highway Agency	9	1050	4	N	38.0678	-89.5564	3	2	134.46	8	0	219	1928
000073200333001	9	State Highway Agency	0	3350	4	N	37.9615	-89.3326	9	2	201.69	8	30	119	2000
000073200533003	9	State Highway Agency	0	3050	4	N	38.1771	-89.5756	4	2	201.69	8	45	119	2001
000073200633263	8	State Highway Agency	0	4000	4	N	37.9981	-89.5942	4	2	179.28	8	5	119	2002
000073300316655	53	County Highway Agency	8	1250	4	7	38.0043	-89.4631	20	3	1842.28	8	0	302	1964
000073300516657	25	County Highway Agency	9	1650	4	8	38.0042	-89.4467	12	3	869	8	0	302	1931
000073300816660	50	County Highway Agency	8	300	4	8	38.1997	-89.3419	19	3	1738	8	0	302	1955
000073301416667	27	County Highway Agency	8	450	4	8	38.1365	-89.3430	9	3	979.56	8	0	101	1959
000073301516668	19	County Highway Agency	8	850	4	8	38.1075	-89.3477	7	3	425.79	8	0	101	1959
000073302716671	9	County Highway Agency	8	700	4	9	37.9726	-89.2473	8	1	201.69	8	45	501	1900
000073302916684	12	Town Highway Agency	4	10	4	4	38.2018	-89.4565	12	1	261.96	5	0	302	1926
000073303316688	9	Town Highway Agency	4	50	4	8	38.1694	-89.4631	9	1	196.47	8	0	302	1940
000073304616701	10	Town Highway Agency	4	25	4	5	38.2045	-89.4605	9	1	218.3	5	0	302	1900
000073304916704	7	Town Highway Agency	6	50	4	8	38.1049	-89.4533	7	1	156.87	8	0	101	1900
000073306116716	9	Town Highway Agency	5	25	4	8	37.9642	-89.3458	9	1	196.47	8	0	302	1900
000073307216727	6	Town Highway Agency	4	25	4	3	38.1778	-89.2771	6	1	130.98	8	0	302	1900
000073309416750	16	Town Highway Agency	6	25	4	8	38.0824	-89.1637	15	1	349.28	8	0	302	1940
000073309724965	8	County Highway Agency	7	200	4	8	38.0525	-89.1419	8	1	179.28	8	0	104	1976
000073309824966	10	Town Highway Agency	6	75	4	8	38.1614	-89.1582	9	1	224.1	8	0	104	1977
000073309927201	23	Town Highway Agency	6	25	4	8	37.9606	-89.4298	10	3	834.44	8	0	101	1977
000073310024968	12	Town Highway Agency	6	350	4	8	38.0226	-89.2152	11	1	268.92	8	0	104	1977
000073310124969	8	County Highway Agency	10	1650	4	8	38.0042	-89.4505	7	1	179.28	8	0	104	1977
000073310224970	14	Town Highway Agency	6	175	4	8	38.1678	-89.3870	13	1	313.74	8	0	505	1978
000073310324971	17	Town Highway Agency	6	125	4	8	37.9670	-89.3825	16	1	380.97	8	0	505	1978
000073310424972	6	County Highway Agency	9	300	4	N	38.1123	-89.1360	3	2	134.46	8	0	119	1978
000073310524973	10	County Highway Agency	9	1000	4	8	38.0129	-89.1839	9	1	224.1	8	0	104	1977
000073310624974	14	Town Highway Agency	6	50	4	8	38.1684	-89.5743	13	1	313.74	8	35	505	1978
000073310803501	17	Town Highway Agency	7	25	4	8	37.9594	-89.4429	16	1	380.97	8	0	505	1980
000073310903538	6	Town Highway Agency	7	200	4	N	38.0534	-89.3523	3	2	134.46	8	20	119	1980
000073311003553	18	Town Highway Agency	7	25	4	8	37.9649	-89.4936	17	1	403.38	8	0	505	1980
000073311103607	45	Town Highway Agency	7	150	4	8	38.0340	-89.4876	15	3	1330.65	8	10	505	1980
000073311203635	30	County Highway Agency	7	100	4	8	38.1799	-89.4430	11	3	887.1	8	0	505	1980
000073311303671	7	Town Highway Agency	7	25	4	N	38.1889	-89.5264	3	2	156.87	8	0	119	1980
000073311403764	7	Town Highway Agency	7	125	4	N	38.1894	-89.5273	3	2	156.87	8	15	119	1900
000073311509833	31	County Highway Agency	9	300	4	9	38.1120	-89.1321	13	3	916.67	8	36	505	1981
000073311609842	15	County Highway Agency	7	225	4	9	38.0526	-89.1474	14	1	336.15	8	0	505	1981

Highway Bridges

Bridge Name	Bridge Length (m)	Bridge Owner	Bridge Width (m)	Daily Traffic (cars/day)	Flood Structure Foundation Type	General Condition Rating	Latitude	Longitude	Maximum Span Length (m)	Number of Spans	Replacement Cost ($1,000)	Scour Index	Skew Angle (degrees)	Structure Type	Year Built (Between 1500 and 2100)
000073311709855	16	Town Highway Agency	7	125	4	8	38.1155	-89.5055	15	1	358.56	8	15	505	1981
000073311809879	18	Town Highway Agency	7	50	4	8	38.0671	-89.1578	17	1	403.38	8	30	505	1981
000073311909897	12	Town Highway Agency	7	50	4	9	38.1464	-89.5693	12	1	268.92	8	0	505	1981
000073312009915	17	Town Highway Agency	7	125	4	9	38.2013	-89.5358	16	1	380.97	8	0	505	1981
000073312100776	14	Town Highway Agency	7	100	4	8	38.0404	-89.4288	14	1	313.74	8	0	505	1900
000073312200761	27	Town Highway Agency	7	50	4	9	38.2055	-89.3335	18	2	798.39	8	0	505	1957
000073312300747	18	Town Highway Agency	7	125	4	8	38.1168	-89.5681	17	1	403.38	8	15	505	1900
000073312400729	17	Town Highway Agency	7	125	4	8	38.1157	-89.5147	16	1	380.97	8	0	501	1900
000073312500706	15	Town Highway Agency	7	75	4	9	38.1983	-89.4798	14	1	336.15	8	0	505	1900
000073312600640	26	Town Highway Agency	7	125	4	8	38.0551	-89.4309	16	2	768.82	8	0	501	1983
000073312808047	25	Town Highway Agency	7	200	4	9	37.9644	-89.4843	12	2	739.25	8	0	501	1983
000073312907930	19	Town Highway Agency	7	200	4	9	37.9659	-89.4842	19	1	425.79	8	30	501	1983
000073313007915	21	Town Highway Agency	7	175	4	9	38.0387	-89.2255	20	1	620.97	8	0	501	1983
000073313107875	17	Town Highway Agency	7	225	4	8	38.1319	-89.5775	17	1	380.97	8	25	501	1983
000073313208014	18	Town Highway Agency	7	50	4	9	38.1705	-89.4077	17	1	403.38	8	25	501	1983
000073313307862	42	Town Highway Agency	7	25	4	9	38.0340	-89.4895	21	2	1241.94	8	40	505	1984
000073313401061	56	Town Highway Agency	7	150	4	8	38.0510	-89.5016	18	3	1655.92	8	0	505	1984
000073313501085	13	County Highway Agency	6	25	4	8	38.0675	-89.1410	7	2	291.33	8	0	505	1985
000073313601747	31	Town Highway Agency	7	150	4	9	38.0300	-89.3646	30	1	916.67	8	0	505	1986
000073313718251	18	Town Highway Agency	8	200	4	8	38.0994	-89.4437	18	1	403.38	8	49	505	1986
000073313820776	12	County Highway Agency	8	850	4	9	38.0172	-89.1528	12	1	268.92	8	0	505	1987
000073314020779	19	Town Highway Agency	7	50	4	8	38.0836	-89.1682	18	1	425.79	8	25	505	1987
000073314120781	17	Town Highway Agency	7	100	4	9	38.1851	-89.2498	16	1	380.97	8	30	505	1987
000073314220782	17	County Highway Agency	8	325	4	9	38.0535	-89.2255	17	1	380.97	8	0	505	1987
000073314320783	18	County Highway Agency	8	325	4	9	38.0535	-89.2237	18	1	403.38	8	0	505	1987

Dams

Facility Name	Action Plan	County Name	Distance to Nearest City (mile)	Drainage Area of Dam (sq. miles)	Length of Dam (ft)	Height of Dam (ft)	Latitude	Longitude	Maximum Discharge Rate (ft3/sec)	Maximum Storage Area (acre-ft)	Name of River	NATDAM ID Number	Nearest City to Dam	Normal Storage Area (acre-ft)	Owner of the Dam	Purpose of the Dam	Relative Hazard Rating Emergency	Replacement Cost ($1,000)	Spillway Type on Dam	Spillway Width (ft)	Surface Area of Water (acres)	Year Built
PINCKNEYVILLE RESERVOIR DAM	Y	PERRY	2	6.5	920	45	38.0969	-89.3955	6371	6565	OPOSSUM CREEK	IL00537	PINKNEYVILLE	2870	City of Pinckneyville	S	S		U	50	202	1953
NEW CHERRY LAKE DAM	N	PERRY	1	0	340	22	38.0329	-89.2256	0	72	REESE CREEK	IL00546	DUQUOIN	58		R	L		N	0	0	
SOUTHWESTERN IL/ /HEADQUARTERS LAKE	N	PERRY	37	0	475	8	38.0028	-89.5162	0	414	PIPESTONE CREEK	IL00539	MURPHYSBORO	45	Southwestern Illinois Coa	S	S		U	10	0	1962
FOERICH POND DAM	N	PERRY	30	0	450	21	38.1978	-89.5420	0	122	TRIB MUD CREEK	IL00536	NEW ATHENS	66	Andy Foertch	P	L		N	0	0	1953
LAKE DUQUOIN DAM	N	PERRY	3	0	700	18	38.0617	-89.2233	0	2544	REESE CREEK	IL00535	DUQUOIN	1387	City of DuQuoin	R	S		U	69	0	1937
ELKS RESERVOIR DAM	N	PERRY	14	0	510	16	38.0788	-89.3115	0	61	PANTHER CREEK	IL00733	VERGENNES	42	Perry County Country Club	R	L		U	35	0	1930
YEARHING LAKE DAM	N	PERRY	37	0	350	15	38.0122	-89.4905	0	158	GALUM CREEK	IL00939	MURPHYSBORO	24	Unknown	RP	L		U	10	0	
KATHLEEN MINE	N	PERRY	1	0.11	0	22	38.1856	-89.5722	367	280		IL83498	CUTLER	0	CUTLER MINING CO.	T	S		U	0	0	
FIDELITY MINE NO.II	N	PERRY	0	0	0	16	37.9656	-89.3278	0	1080		IL83502	NO TOWN	0	FREEMAN UNITED COAL MININ	T	L		U	0	0	

Appendix G – Map of Critical Facilities

Appendix H – Top ten flood flows form the USGS Stream Gauge Data

County	Perry County	
Station	Matthews, IL	
River	Beaucoup Creek	
Period of Record	1946-1982	
Latitude	37.9675	
Longitude	89.35222	
Rank	**Year**	**Discharge (cfs)**
1	1961	18,800
2	1946	18,100
3	1949	13,800
4	1950	13,800
5	1968	11,600
6	1957	11,200
7	1958	10,500
8	1977	9,870
9	1979	8,560
10	1964	8,340