Multi-Hazard Mitigation Plan

McDonough County

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Multi-Hazard Mitigation Plan

McDonough County, Illinois

Adoption Date: -- _____ --

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Table of Contents

Section 1 - Public Planning Process 5
1.1 Narrative Description 5
1.2 Planning Team Information 5
1.3 Public Involvement in Planning Process 6
1.4 Neighboring Community Involvement 7
1.5 Review of Technical and Fiscal Resources 7
1.6 Review of Existing Plans 9

Section 2 - Jurisdiction Participation Information 10
2.1 Adoption by Local Governing Body 10
2.2 Jurisdiction Participation 10

Section 3 - Jurisdiction Information 12
3.1 Topography 12
3.2 Climate 13
3.3 Demographics 13
3.4 Economy 14
3.5 Industry 15
3.6 Land Use and Development Trends 16
3.7 Major Lakes, Rivers, and Watersheds 19

Section 4 - Risk Assessment 21
4.1 Hazard Identification/Profile 21
4.1.1 Existing Plans 21
4.1.2 National Hazard Records 21
4.1.3 Hazard Ranking Methodology 23
4.1.4 GIS and HAZUS-MH 26
4.2 Vulnerability Assessment 27
4.2.1 Asset Inventory 27
4.2.1.2 Essential Facilities List 28
4.2.1.3 Facility Replacement Costs 28
4.3 Future Development 29
4.4 Hazard Profiles 30
4.4.1 Tornado Hazard 30
4.4.2 Flood Hazard ..... 40_Toc253656523
4.4.3 Earthquake 49
4.4.4 Thunderstorm Hazard 58
4.4.5 Drought and Extreme Heat Hazard 70
4.4.6 Winter Storm Hazard 74
4.4.7 Hazardous Materials Storage and Transport Hazard 79
4.4.8 Fire Hazard 87
4.4.9 Subsidence 90

Section 5 - Mitigation Strategy 99
5.1 Community Capability Assessment 100
5.1.1 National Flood Insurance Program (NFIP) 100

5.1.2 Stormwater Management Stream Maintenance Ordinance 101
5.1.3 Zoning Management Ordinance 101
5.1.4 Erosion Management Program/ Policy 102
5.1.5 Fire Insurance Rating Programs/ Policy 102
5.1.6 Land Use Plan 102
5.1.7 Building Codes 102
5.2 Mitigation goals 102
5.3 Mitigation Actions/Projects 103
5.4 Implementation Strategy and Analysis of Mitigation Projects 105
5.5 Multi-Jurisdictional Mitigation Strategy 113

Section 6 - Plan Maintenance 115
6.1 Monitoring, Evaluating, and Updating the Plan 115
6.2 Implementation through Existing Programs 115
6.3 Continued Public Involvement 115
Glossary of Terms 113

Appendix A: Multi-Hazard Mitigation Plan Meeting Minutes 119

Appendix B: Local Newspaper Articles and Photographs 129

Appendix C: Adopting Resolutions 146

Appendix D: NCDC Historical Hazards 160

Appendix E: Historical Hazard Maps 170

Appendix F: Critical Facilities Maps 165

Appendix G: Stream Gauge Data 189

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 required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt an MHMP.

In recognition of the importance of planning in mitigation activities, FEMA created **Haz**ards **US**A **M**ulti-**H**azard (HAZUS-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. Southern Illinois University at Carbondale (SIUC) and The Polis Center (Polis) at Indiana University Purdue University Indianapolis (IUPUI) are assisting McDonough County with performing the hazard risk assessment.

1.2 Planning Team Information

The McDonough County Multi-Hazard Mitigation Planning Team is headed by Dan Kreps, who is the primary point of contact. Members of the planning team include representatives from various county departments, cities and towns, and public and private utilities. Table 1-1 identifies the planning team individuals and the organizations they represent.

Table 1-1: Multi Hazard Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Dan Kreps	Director	Emergency Services and Disaster Agency	McDonough County
Lynnette Cale	Administrator	McDonough County Health Department	McDonough County
Tammy Camp	Chief County Assessment Officer	McDonough County	McDonough County
David Raymond	Superintendent	Bushnell Street Department	City of Bushnell
Merville Hilliard	Chief	Bushnell Police Department	City of Bushnell
Mary Brown	Coordinator	Bushnell ESDA	City of Bushnell
Danay Bick	Mayor	City of Colchester	City of Colchester
Robbie Phelps		City of Colchester	City of Colchester
Curt Barker	Chief	Macomb Police Department	City of Macomb
Ed Lavin	City Council Member	City of Macomb	City of Macomb

Name	Title	Organization	Jurisdiction
Walter Burnett	Public Works Director	City of Macomb	City of Macomb
J.R. Hyde	Deputy Chief	Macomb Fire Department	City of Macomb
Jake Kreps		Village of Blandinsville	Village of Blandinsville
Williy Carnes		Village of Blandinsville	Village of Blandinsville
Todd Danner		Village of Good Hope	Village of Good Help
Terry Seaver		Village of Industry	Village of Industry
Jack Faybee		Village of Prairie City	Village of Prairie City
Todd Louden		Village of Scotia	Village of Scotia
Sharon Faulk	Clerk	Village of Tennessee	Village of Tennessee
John Jessen	Director Support Services	McDonough District Hospital	Macomb District Hospital
Barbara Whedbee	EMS Director	McDonough District Hospital	Macomb District Hospital
Dana Biernbaum	Assistant Vice President for Administrative Services	Western Illinois University	Western Illinois University
Joe Heckman	Graduate Assistant Emergency Management	Western Illinois University	Western Illinois University
Chad Sperry	Director	GIS Laboratory	Western Illinois University

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

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

An MHMP kickoff meeting was held at the McDonough County Health Department building on December 17, 2009. Representatives from SIUC and The Polis Center explained the rationale behind the MHMP program and answered questions from the participants. SIUC representatives provided an overview of HAZUS-MH, described the timeline and the process of the mitigation planning project, and presented McDonough County with a Memorandum of Understanding (MOU) for sharing data and information.

The McDonough County Multi-Hazard Mitigation Planning Committee met on February 9, 2010, March 23, 2010, May 18, 2010, June 14, 2010, and July 26, 2010. Each meeting was approximately two hours in length. The meeting minutes are included in Appendix A. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

1.3 Public Involvement in Planning Process

An effort was made to solicit public input during the planning process, and a public meeting was held on May 18, 2010 to review the county's risk assessment. Appendix A contains the minutes from the public meeting. Appendix B contains press releases sent to local newspaper throughout the public input process.

1.4 Neighboring Community Involvement

The McDonough County planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The team also invited participation from adjacent counties to obtain their involvement in the planning process. Details of neighboring stakeholders' involvement are summarized in Table 1-2.

Table 1-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Chris Helle	Fulton County	Fulton County Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Jack Curfman	Hancock County	Hancock County Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Jenna Link	Henderson County	Henderson County Health Department	Invited to participate in public meeting, reviewed the plan and provide comments.
Rich Utter	Schuyler County	Schuyler Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Aaron Winski	Warren County	Schuyler Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide 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
Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps
U.S. Census	County Profile Information, e.g. Population and Physical Characteristics
Department of Commerce and Economic Opportunity	Community Profiles
Illinois Department of Employment Security	Industrial Employment by Sector
NOAA National Climatic Data Center	Climate Data
Illinois Emergency Management Agency	2007 Illinois Natural Hazard Mitigation Plan
Illinois Water Survey (State Climatologist Office)	Climate Data
United States Geological Survey	Physiographic/Hill Shade Map, Earthquake Information, Hydrology
Illinois State Geological Survey	Geologic, Karst Train, Physiographic Division and Coal Mining Maps

1.6 Review of Existing Plans

McDonough County and its local communities utilized a variety of planning documents to direct community development. These documents include land use plans, comprehensive plans, emergency response plans, municipal ordinances, and building codes. The planning process also incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 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
FEMA	2009	McDonough County Flood Insurance Study	Describes the NFIP program, which communities participates; provide flood maps	Sections 4 and 5
Supervisor of Assessments	2009	GIS Database	Parcel and Assessor Data For McDonough County.	Section 4
State of Illinois Emergency Management Plan	2007	2007 Illinois Natural Hazard Mitigation Plan	This plan provides an overview of the process for identifying and mitigating natural hazards in Illinois as require by the Disaster Mitigation Act of 2000.	Guidance on hazards and mitigation measures and background on historical disasters in Illinois.
City of Macomb and PGAV Urban Consulting Group	1989,1991 & 2009	Macomb Redevelopment Plan and Project document	This plan created guidelines and goals for the City of Macomb and its zoning.	Sections 3 and 5

Section 2 - Jurisdiction Participation Information

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

Table 2-1: Participating Jurisdictions

Jurisdiction Name
McDonough County
Village of Bardolph
Village of Blandinsville
City of Bushnell
City of Colchester
Village of Good Hope
Village of Industry
City of Macomb
Village of Prairie City
Village of Sciota
Village of Tennessee

2.1 Adoption by Local Governing Body

The draft plan was made available on July 26, 2010 to the planning team for review. Comments were then accepted. The McDonough County hazard mitigation planning team presented and recommended the plan to the County Commissioners, who adopted it on <date adopted>. Resolution adoptions are included in Appendix C of this plan.

2.2 Jurisdiction Participation

It is required that each jurisdiction participates in the planning process. Table 2-2 lists each jurisdiction and describes its participation in the construction of this plan.

Table 2-2: Jurisdiction Participation

Jurisdiction Name	Participating Member	Participation Description
McDonough County	Dan Kreps	MHMP planning team member
Village of Bardolph		MHMP planning team member
Village of Blandinsville	Jake Kreps and WillyCarnes	MHMP planning team member
City of Bushnell	Mary Brown	MHMP planning team member
City of Colchester	Robbie Phelps and Danay Bick	MHMP planning team member
Village of Good Hope	Todd Danner	MHMP planning team member
Village of Industry	Terry Seaver	MHMP planning team member
City of Macomb	J.R. Hyde	MHMP planning team member
Village of Prairie City	Jack Faybee	MHMP planning team member
Village of Sciota	Todd Louden	MHMP planning team member
Village of Tennessee	Sharon Foulk	MHMP planning team member

All members of the MHMP planning committee were actively involved in attending the MHMP meetings, providing available Geographic Information Systems (GIS) data and historical hazard

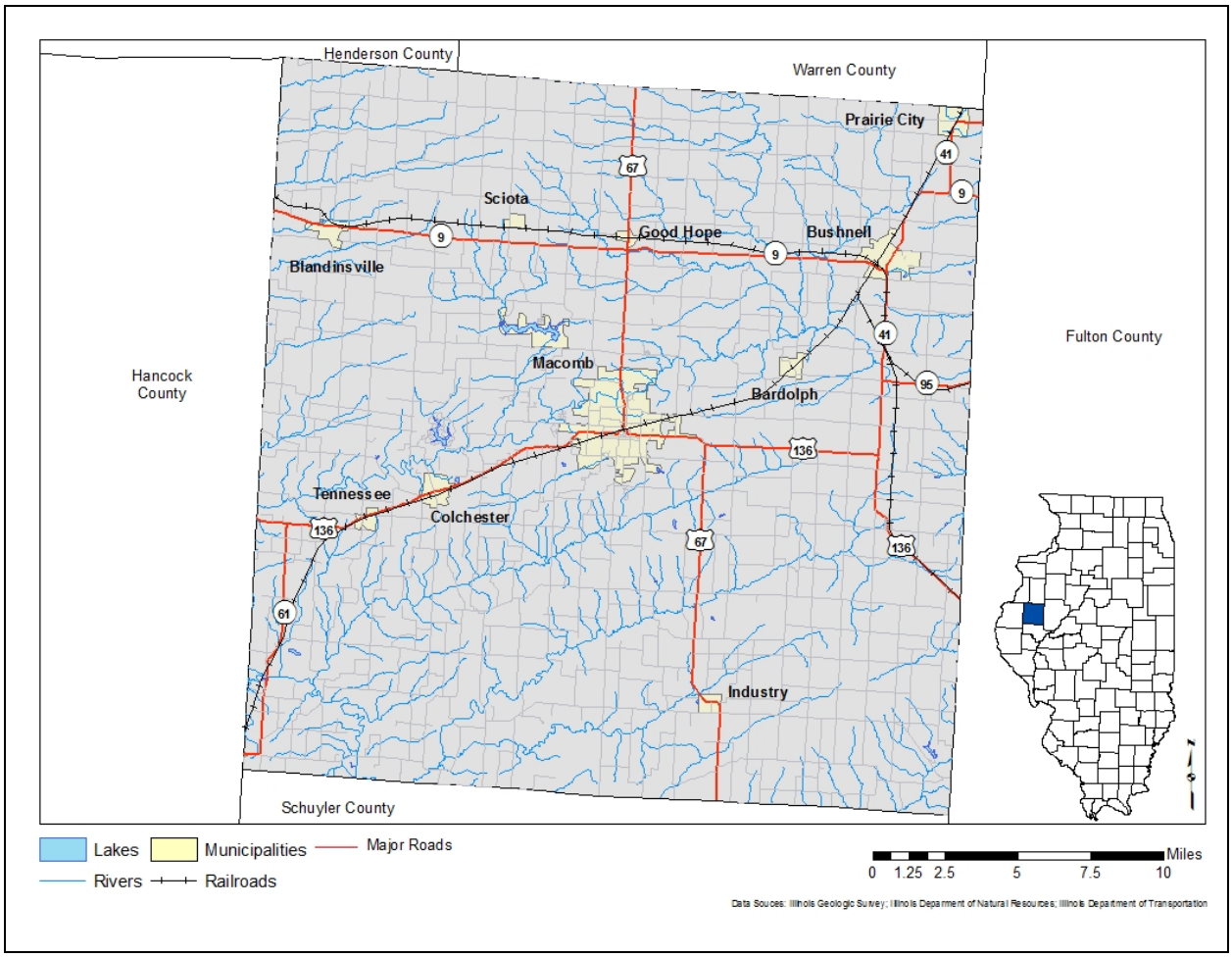
information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and coordinating the county's formal adoption of the plan.

Section 3 - Jurisdiction Information

McDonough County was part of the "Military Tract" set aside by Congress for veterans of the War of 1812. The County was named in honor of Thomas McDonough who defeated a British squadron in the naval Battle of Lake Champlain. The City of Macomb is the county seat.

McDonough County is located in the west-central Illinois. The county has total land area of 590 square miles. It is bordered by Warren County in the north, Fulton County in the east, Schuyler County in the south, Hancock County in the west, and Henderson County in the northwest. Figure 3-1 depicts McDonough County's location.

Figure 3-1: McDonough County, Illinois



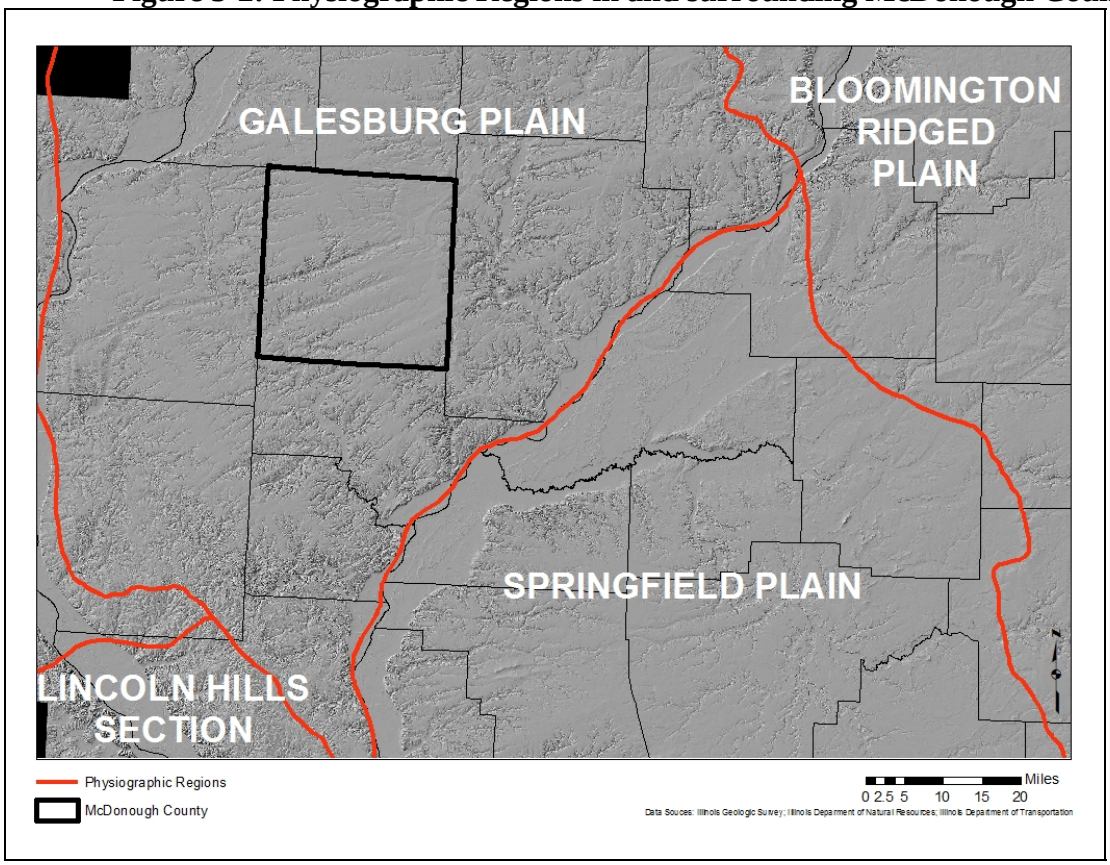
Sources:http://www.cyberdriveillinois.com/departments/archives/irad/McDonough.html; http://www.fedstats.gov/qf/states/17000.html; http://factfinder.census.gov; http://www.genealogytrails.com

3.1 Topography

McDonough County is situated in the Central Lowland Province of the Till Plains Section and lies within the Galesburg Plain physiographic division. The Galesburg Plain is till plain Illinoisan

in age which varies from level ground to rolling hills with a few moraine ridges. Figure 3-2 illustrates the physiographic regions surrounding McDonough County.

Figure 3-2: Physiographic Regions in and surrounding McDonough County



3.2 Climate

McDonough County climate is typical of Central Illinois. The variables of temperature, precipitation, and snowfall can vary greatly from one year to the next. Winter temperatures can fall below freezing starting as early as September and extending as late as May. Based on National Climatic Data Center (NCDC) normals from 1971 to 2000 for Peoria, which is the closest city with available climate data, the average winter low is 14.3° F and the average winter high is 36.6° F. In summer, the average low is 60.1° F and average high is 85.7° F. Average annual precipitation is 36.03 inches throughout the year.

3.3 Demographics

McDonough County has a population of 32,913. According to American FactFinder (2008), McDonough County's population stayed relatively constant from 2000 to 2008. The population is spread throughout 19 townships: Bethel, Blandinsville, Bushnell, Chalmers, Colchester, Eldorado, Emmet, Hire, Industry, Lamoine, Macomb, Macomb City, Mound, New Salem, Prairie City, Sciota, Scotland, Tennessee, and Walnut Grove. The largest community in McDonough County is Macomb, which has a population of approximately 18,558. The breakdown of

population by incorporated and unincorporated areas is included in Table 3-1. Incorporated communities are marked with an asterisk (*).

Table 3-1: Population by Township

Township	2000 Population	% of County
Bethel	383	1.16
Blandinsville*	1,003	3.05
Bushnell*	3,444	10.46
Chalmers	740	2.25
Colchester*	1,959	5.95
Eldorado	227	0.69
Emmet	1,318	4.00
Hire*	246	0.75
Industry*	851	2.59
Lamoine*	400	1.22
Macomb*	608	1.85
Macomb City*	18,558	56.39
Mound*	279	0.85
New Salem	412	1.25
Prairie City*	595	1.81
Sciota*	574	1.74
Scotland	444	1.35
Tennessee*	408	1.24
Walnut Grove*	464	1.41

Source: American FactFinder, 2000

3.4 Economy

American FactFinder reported for 2000 that 61.2% of the workforce in McDonough County was employed in the private sector. The breakdown is included in Table 3-2. Educational services, health care, and social assistance represents the largest sector, employing approximately 38.2% of the workforce. The 2000 annual per capita income in McDonough County is $19,035.

Table 3-2: Industrial Employment by Sector

Industrial Sector	% Dist. In County (2000)
Agriculture, forestry, fishing, hunting, and mining	4.2
Construction	3.7
Manufacturing	8.1
Wholesale trade	1.6
Retail trade	11.5
Transportation, warehousing and utilities	3.9
Information	1.0
Finance, insurance, real estate, and rental/leasing	6.3
Professional, technical services	4.0
Educational services, health care, and social assistance	38.2

Industrial Sector	% Dist. In County (2000)
Arts, entertainment, recreation	10.3
Public administration	3.4

Source: American FactFinder, 2000

3.5 Industry

McDonough County's major employers and number of employees are listed in Table 3-3. The largest employer is Western Illinois University, which was established in 1888 and has approximately 2,200 employees. NTN Bower is the second largest, with 516 employees.

Table 3-3: Major Employers

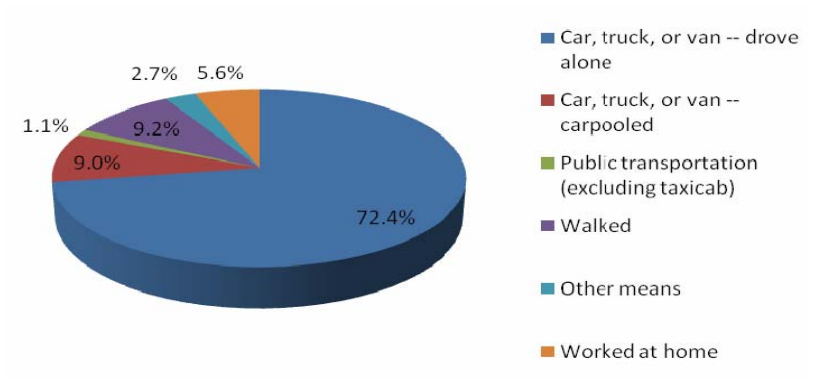
Company Name	City/Town	Year Established	# of Employees	Type of Business
Manufacturing				
Kitchen Cooked	Bushnell	1934	49	Potato Processing
Midwest Control Products	Bushnell			Fabrication
Norforge	Bushnell	1904	32	Forged and Machined Components
Vaughan & Bushnell	Bushnell	1882	145	Tool Making
Yetter Manufacturing	Colchester		122	Farm Equipment
Whalen Manufacturing	Macomb		82	
Pella Corporation	Macomb		330	Window Manufacturing
NTN Bower	Macomb		516	Cylindrical and Tapered Roller Bearings
Bushnell Illinois Tank Company	Bushnell		57	Farm Equipment
Health Care				
McDonough District Hospital	Macomb		483	Medicine
Wesley Village	Macomb		98	Retirement/Nursing Care
Bridgeway, Inc.	Macomb		226	Rehabilitation Services
Other				
Western Illinois University	Macomb	1899	2,192	Higher Education
Walmart	Macomb		235	Retail
Sodexo	Macomb		190	Food Services
Mosaic	Macomb		170	
Farm King	Macomb		56	
Archer Daniels Midland	Bushnell		28	Food Preparation

Source: McDonough County Planning Team

Commuter Patterns

According to American FactFinder information from 2000, approximately 16,275 of McDonough County's population are in the work force. The average travel time from home to work is 14.6 minutes. Figure 3-3 depicts the commuting patterns for McDonough County's labor force.

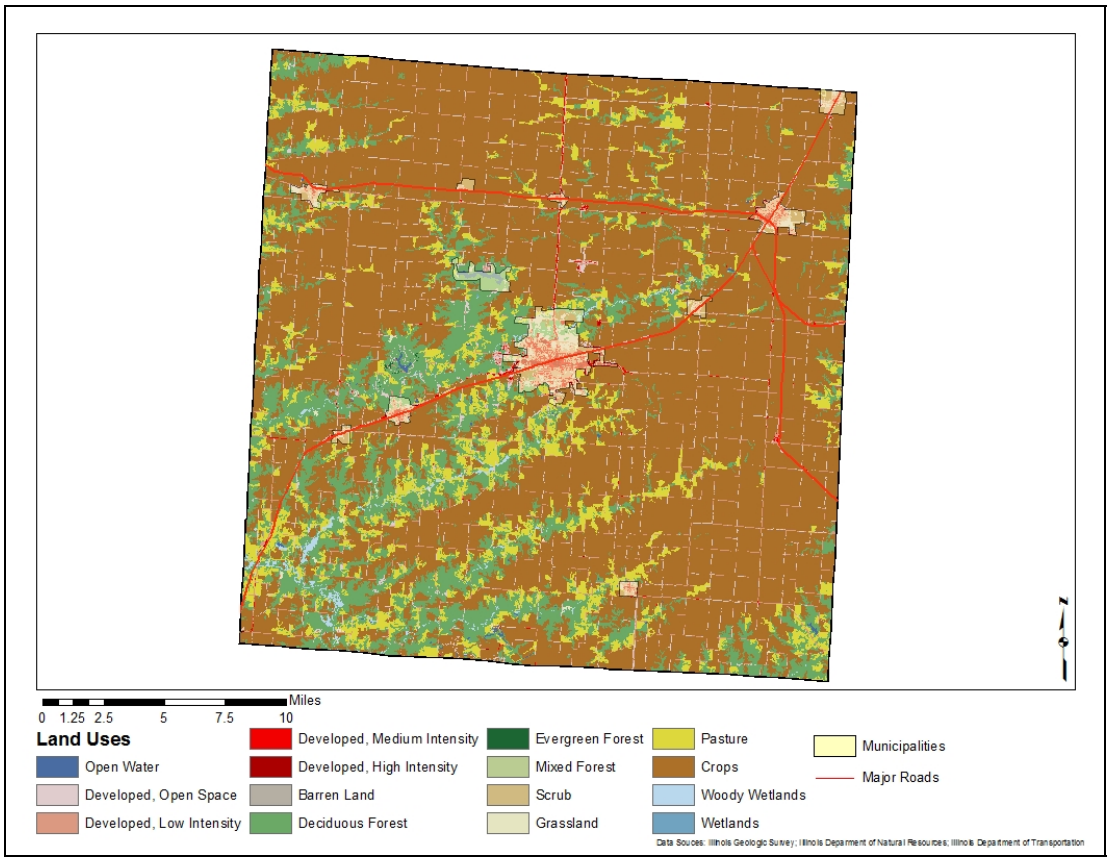
Figure 3-3: Commuter Patterns for McDonough County



3.6 Land Use and Development Trends

Agriculture is the predominant land use in McDonough County with over 75% of the land used as pasture or for growing crops. Other significant land uses include manufacturing, residential, and tourism. McDonough County is also home to Argyle State Park and Argyle Hollows Barrens Nature Preserve which offer fishing, hiking, camping and boating facilities. Figure 3-4 shows the land use in McDonough County.

Figure 3-4: McDonough County Land Use



In October of 1986, the City of Macomb contracted PGAV Urban Consulting to create a Redevelopment Plan and Project document. This plan created guidelines and goals for the City of Macomb and its zoning. As demands of the city changed and the downtown began to deteriorate, amendment of the Redevelopment Plan was necessary. This Redevelopment Plan was edited and amended twice, 1991 and September of 2009. The current zoning for the City of Macomb is shown in Figure 3-5. The amendments in 2009 are concerned with proposing a tax increment to increase the funds available to recreate the City of Macomb, specifically the downtown area. Current zoning for the downtown is seen in Figure 3-6. The 2009 Redevelopment Plan (also referred to as the West Side Redevelopment Project) focuses on enhancing 140 acres of the City of Macomb. The 140 acres encompasses 364 parcels, 11 of which are vacant. The current zoning of the 140 acres consists of residential, commercial, institutional and industrial. Moving forward with this plan is restricted by access to properties (e.g. presence of railroad tracks) and available funds.

Figure 3-5: Existing Zoning for Macomb, Illinois

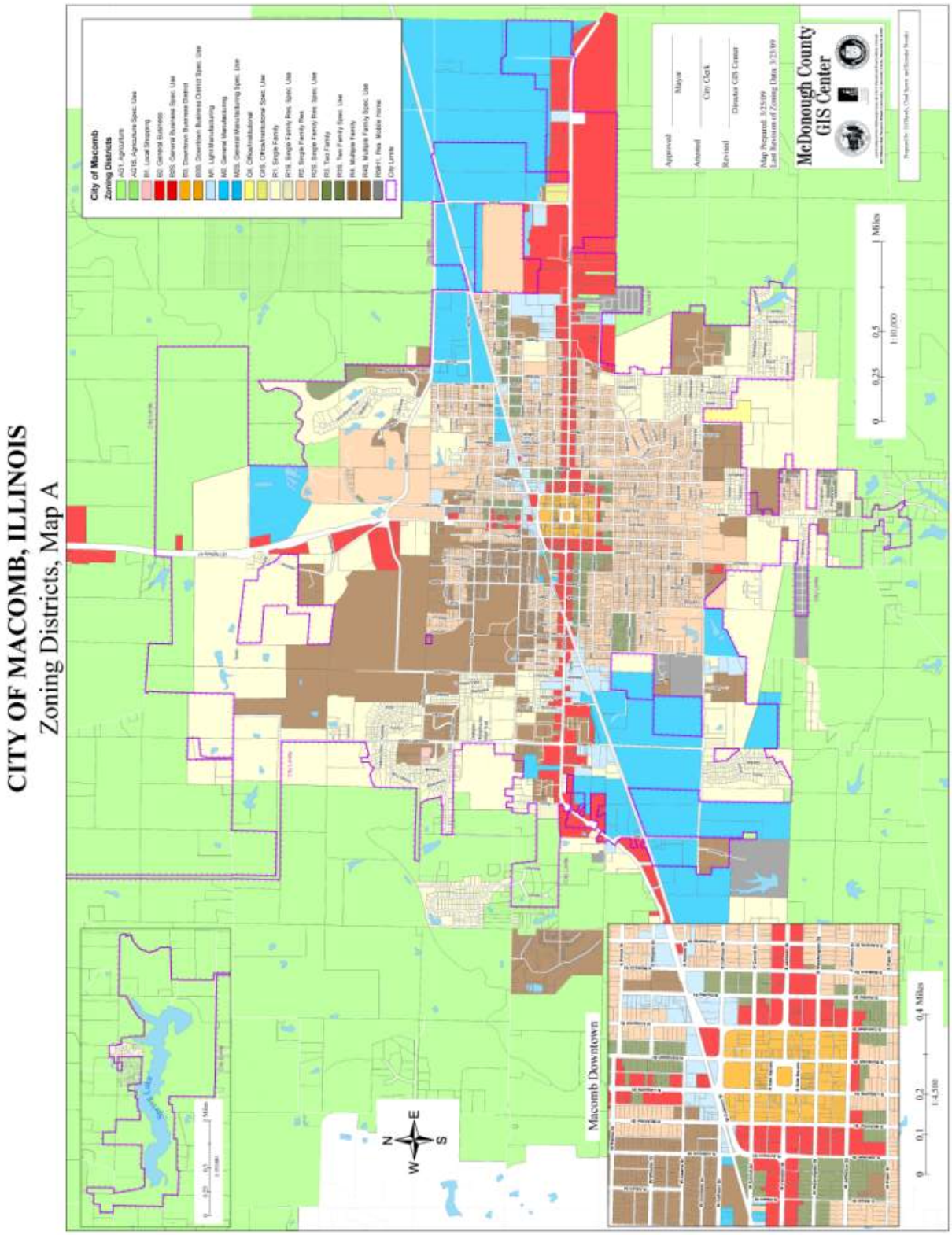
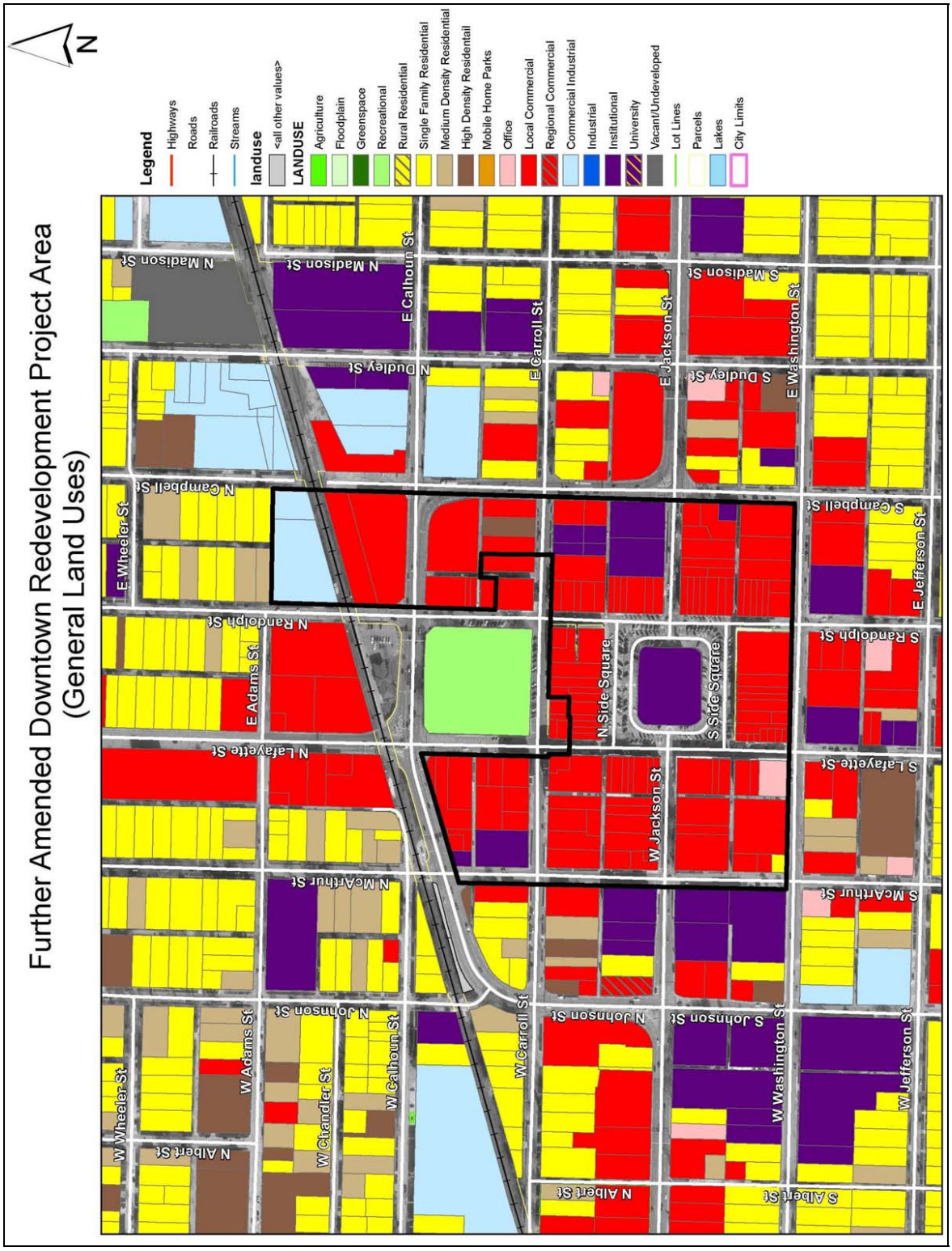
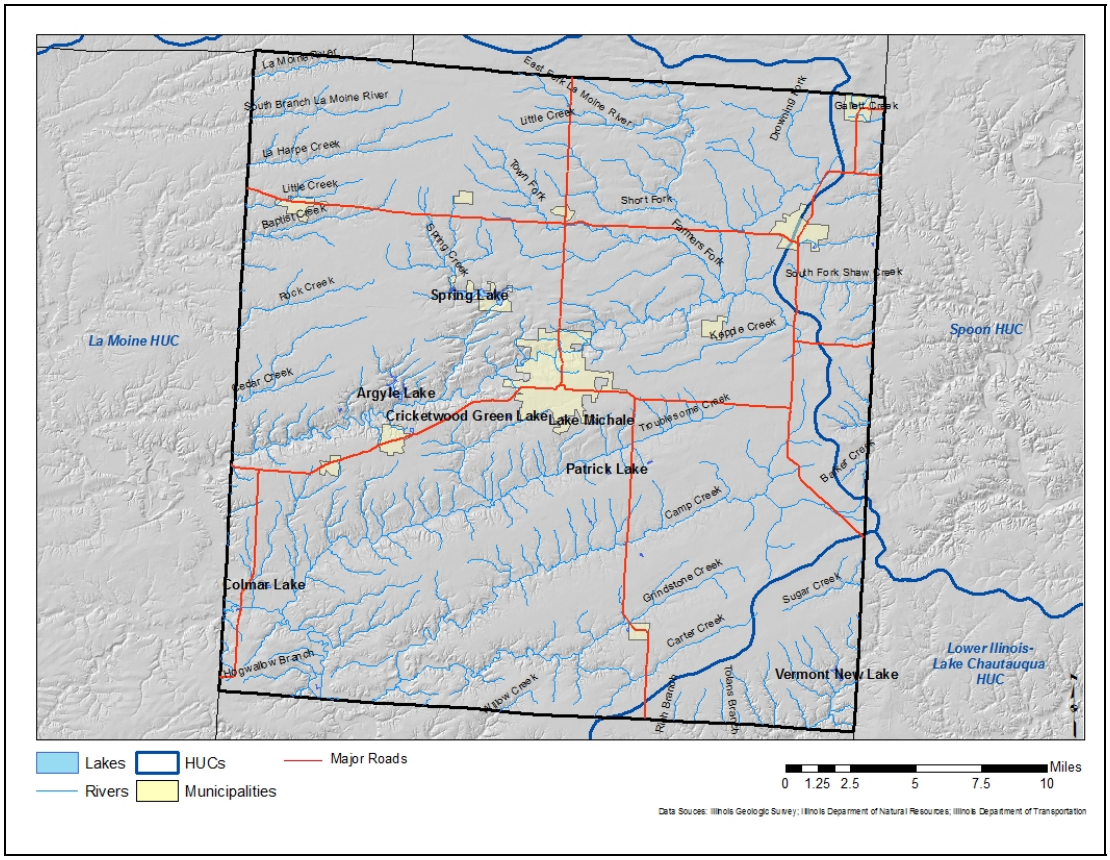


Figure 3-6: Detailed current land use of downtown Macomb, Illinois, one of the main focus areas of the West Side redevelopment Project.



3.7 Major Lakes, Rivers, and Watersheds

McDonough County has a number of bodies of water including Spring Lake, Argyle Lake, Lake Michael, Cricketwood Green Lake, Patrick Lake, Colmar Lake and Vermont New Lake. According to the USGS, McDonough County consists of three drainage basins: La Moine (HUC 730010), the Lower Illinois-Lake Chautauqua (HUC 7130003) and the Spoon (HUC 7130005; Figure 3-6).



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. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people. This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected 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 1-4 did not contain a risk analysis. These local planning documents were reviewed to identify historical hazards and help identify risk. To facilitate the planning process, State flood data was used for the flood analysis.

4.1.2 National Hazard Records

4.1.2.1 National Climatic Data Center (NCDC) Records

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

The NCDC data included 149 reported events in McDonough County between May 12, 1957 and the October 31, 2009 (the most updated information as of the date of this plan). A summary table of events related to each hazard type is included in the hazard profile sections that follow. Pictures of some of the winter storm events are shown in Appendix D. Full details of individual hazard events can be found on the NCDC website. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC recorded latitude and longitude. These events are plotted and 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

4.1.2.2 FEMA Disaster Information

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

Figure 4-1: FEMA-Declared Emergencies and Disasters in McDonough County (1965-2009)

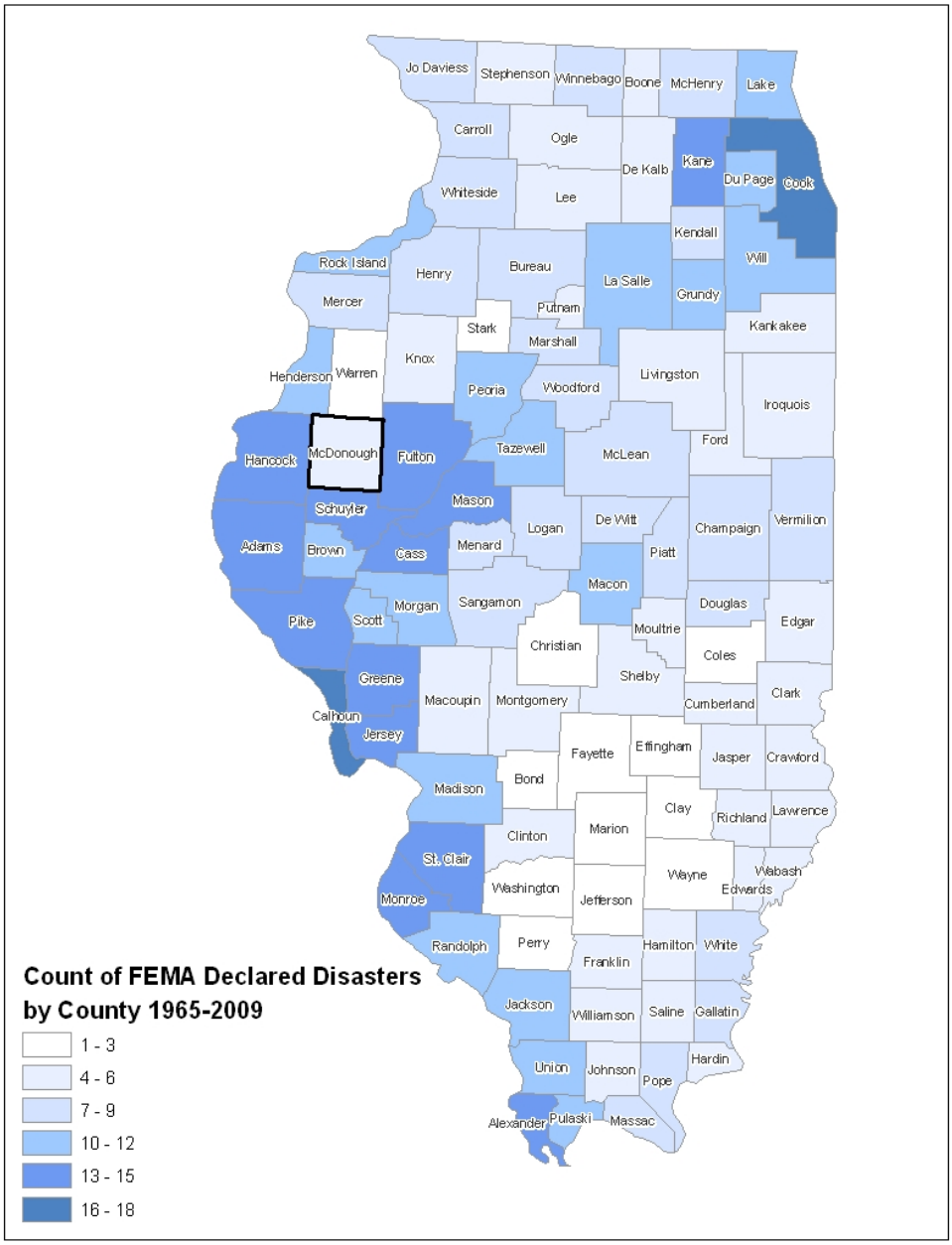


Table 4-2: FEMA-Declared Emergencies in McDonough County (1965-present)

Date of Incident	Date of Declaration	Disaster Description	Type of Assistance
Sept. 21-Oct. 8, 1986	October 8, 1986	Torrential Rains, Flash Flooding	
June 20, 1990	June 22, 1990	Tornadoes, Thunderstorms, Flooding	
January 1, 1999	January 4, 1999	Snow Emergency	Public
December 10-31, 2000	January 17, 2001	Snow and Severe Winter Storms	Public
April 21-May 23, 2002	May 15, 2002	Severe Storms, Tornadoes, Flooding	Individual
May 4-May 10, 2003	May 15, 2003	Tornadoes, Severe Storms, Flooding	Individual

4.1.3 Hazard Ranking Methodology

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

Table 4-3: Planning Team Hazard List

Hazard
Tornado
Fire/Explosion
Thunderstorms/High Winds/Hail/Lightning
Transportation Hazardous Materials Release
Winter Storm
Flooding
Drought/Extreme Heat
Earthquake

4.1.4 Calculating the Risk Priority Index

The first step in determining the Risk Priority Index (RPI) was to have the planning team members generate a list of hazards which have 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 4-4 displays the probability of the future occurrence ranking. This ranking was based upon previous history and the definition of hazard. Using the definitions given, the likelihood of future events is "Quantified" which results in the classification within one of the four "Ranges" of likelihood.

Table 4-4: Future Occurrence Ranking

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

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

Table 4-5: Hazard Magnitude

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

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

Table 4-6: McDonough County Hazards (RPI)

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornado	4 - Highly Likely	8 - Catastrophic	32	1
Fire/Explosion	3 - Likely	4 - Critical	12	2
Thunderstorms/High Winds/Hail/Lightning	4 - Highly Likely	2 - Limited	8	3
Transportation Hazardous Materials Release	3 - Likely	2 - Limited	6	4

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Winter Storm	3 - Likely	2 - Limited	6	5
Flooding	3 - Likely	1 - Negligible	3	6
Drought/Extreme Heat	2 - Limited	1 - Negligible	2	7
Earthquake	1 - Unlikely	2 - Limited	2	8

4.1.5 Jurisdictional Hazard Ranking

Because the jurisdictions in McDonough County differ in their susceptibilities to certain hazards—for example, the city of Macomb, which has a railroad running through it, is more likely to experience a train derailment than the village of Industry which is not located near any railroad—the hazards identified by the planning team were ranked by SIUC for each individual jurisdiction using the methodology outlined in Section 4.1.4. The SIUC rankings were based on input from the planning team members, available historical data, and the hazard modeling results described within this hazard mitigation plan. During the five-year review of the plan this table will be updated by the planning team to ensure these jurisdictional rankings accurately reflect each community's assessment of these hazards. Table 4-7 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern).

Table 4-7: Hazard Rankings by Jurisdiction

Jurisdiction	Hazard							
	Tornado	HAZMAT	Fire/Explosion	Thunderstorms	Flooding	Winter Storms	Extreme Heat/Drought	Subsidence
City of Macomb	1	2	3	4	6	5	N/A	N/A
City of Bushnell	1	2	3	4	6	5	7	NA
Village of Good Hope	1	6	3	4	6	5	7	N/A
Village of Prairie City	1	3	N/A	2	4	5	N/A	NA
Village of Sciota	1	4	2	3	7	5	6	N/A
*Village of Bardolph	1	4	2	3	5	6	7	NA
*Village of Blandinsville	1	4	2	3	6	5	7	NA
*City of Colchester	1	4	2	3	6	5	7	8
*Village of Industry	1	4	2	3	6	5	7	8
*Village of Plymouth	1	4	2	3	5	6	7	NA
*Village of Tennessee	1	4	2	3	5	6	7	8

N/A = Not Applicable
*Hazard ranking for this jurisdiction was completed by SIUC

4.1.6 GIS and HAZUS-MH

The third step in this assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. Where possible, the hazards were quantified using GIS analyses and HAZUS-MH. This process reflects a Level 2 approach to analyzing hazards as defined for HAZUS-MH. The approach includes substitution of selected default data with local data. This process improved 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 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 will fall into a structural class, and structures in each class will respond in a similar fashion to a specific depth of flooding or ground shaking. 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 through GIS, HAZUS-MH, and historical information to predict which communities would be at risk.

Using HAZUS-MH

1. 100-year overbank flooding
2. Earthquake scenarios

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 SIUC; verified the datasets using local knowledge, and allowed SIUC to use their local GIS data for additional verification. SIUC GIS analysts made these updates and corrections to the HAZUS-MH data tables prior to performing the risk assessment. These changes to the HAZUS-MH inventory reflect a Level 2 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 the most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts.
- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) have been applied to the HAZUS-MH model data. HAZUS-MH reports of essential facility losses reflect updated data.

McDonough County provided SIUC with parcel boundaries and county Assessor records. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary. Each parcel point was linked to an Assessor record based upon matching parcel numbers. The generated building inventory points represent the approximate locations (within a parcel) of building exposure.

- The aggregate building inventory tables used in this analysis have not been updated. Default HAZUS-MH model data was used for the earthquake.

- For the flood analysis, user-defined facilities were updated from the building inventory information provided by McDonough County.

Parcel-matching results for McDonough County are listed in Table 4-8.

Table 4-8: Parcel-Matching for McDonough County

Data Source	Count
Assessor Records	17,867
County-Provided Parcels	17,963
Assessor Records with Improvements	12,253
Matched Parcel Points	12,253

The following assumptions were made during the analysis:

- The building exposure for flooding, tornado, and HAZMAT is determined from the Assessor records. It is assumed that the population and the buildings are located at the centroid of the parcel.
- The building exposure for earthquake used HAZUS-MH default data.
- The algorithm used to match county-provided parcel point locations with the Assessor records is not perfect. The results in this analysis reflect matched parcel records only. The parcel-matching results for McDonough County are included in Table 4-8.
- Population counts are based upon 2.5 persons per household. Only residential occupancy classes are used to determine the impact on the local population. If the event were to occur at night, it would be assumed that people are at home (not school, work, or church).
- The analysis is restricted to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.

4.2.1.2 Essential Facilities List

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

Table 4-9: Essential Facilities List

Facility	Number of Facilities
Care Facilities	9
Emergency Operations Centers	2
Fire Stations	8
Police Stations	8
Schools	20

4.2.1.3 Facility Replacement Costs

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

Table 4-10: Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Agricultural	236	$36,487
Commercial	728	$355,771
Education	34	$65,717
Government	37	$16,844
Industrial	198	$130,783

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Religious/Non-Profit	89	$55,069
Residential	13,801	$1,767,275
Total	**15,123**	**$2,427,946**

4.3 Future Development

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

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

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition for Tornado Hazard

Tornadoes pose a great risk to Illinois and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of the state's 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 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour 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 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 miles per hour to F5 tornadoes with effective wind speeds of over 260 miles per hour. The Fujita intensity scale is described in Table 4-11.

Table 4-11: Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
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.

Source: NOAA Storm Prediction Center

Previous Occurrences for Tornado Hazard

There have been several occurrences of tornadoes within McDonough County during the past few decades. The NCDC database reported 29 tornadoes/funnel clouds in McDonough County since 1957. These tornadoes have been attributed with two injuries and over $1.7 million in property damage. The most recent recorded event occurred on December 17, 2008, when a tornado with winds estimated at 80 mph briefly touched down near New Philadelphia.

McDonough County NCDC recorded tornadoes are identified in Table 4-12. Pictures of some of the tornado events are shown in Appendix D. Additional details of individual hazard events can be found on the NCDC website.

Table 4-12: McDonough County Tornadoes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
McDonough County	5/21/1957	Tornado	F3	0	0	250K	0
McDonough County	9/27/1959	Tornado	F2	0	1	250K	0
McDonough County	5/16/1960	Tornado	F1	0	0	25K	0
McDonough County	4/21/1964	Tornado	F3	0	0	25K	0
McDonough County	7/18/1971	Tornado	F1	0	0	25K	0
McDonough County	6/2/1973	Tornado	F1	0	0	0	0
McDonough County	6/2/1973	Tornado	F1	0	0	25K	0
McDonough County	8/8/1973	Tornado	F1	0	0	0	0
McDonough County	4/13/1974	Tornado	F2	0	0	250K	0
McDonough County	6/20/1974	Tornado	F0	0	0	0	0
McDonough County	6/21/1974	Tornado	F1	0	0	0	0
McDonough County	6/24/1975	Tornado	F0	0	0	3K	0
McDonough County	6/8/1981	Tornado	F0	0	0	0	0
McDonough County	3/12/1982	Tornado	F2	0	1	25K	0
McDonough County	5/17/1991	Tornado	F0	0	0	0	0
McDonough County	7/25/1992	Tornado	F0	0	0	0	0
McDonough County	7/25/1992	Tornado	F0	0	0	250K	0
Blandinsville	4/30/1997	Tornado	F1	0	0	20K	0
Industry	4/30/1997	Tornado	F0	0	0	20K	0
Blandinsville	7/19/1997	Tornado	F0	0	0	0	0
Industry	5/12/1998	Tornado	F0	0	0	0	0
Good Hope	4/5/1999	Tornado	F2	0	0	6K	0
Industry	6/1/1999	Funnel Cloud	N/A	0	0	0	0
Bushnell	6/4/1999	Funnel Cloud	N/A	0	0	0	0
McDonough County	7/17/2000	Funnel Cloud	N/A	0	0	0	0
Tennessee	5/10/2003	Tornado	F1	0	0	400K	0
Blandinsville	4/2/2006	Tornado	F1	0	0	150K	0
McDonough County	5/1/2006	Funnel Cloud	N/A	0	0	0	0
New Philadelphia	12/27/2008	Tornado	F0	0	0	0	0

* 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 generally moved from southwest to northeast across the county. The extent of the hazard varies both in terms of the extent of the path and the wind speed.

Risk Identification for Tornado Hazard

Based on historical information, the probability of future tornadoes in McDonough County is likely. 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
4	x	8	=	**32**

Vulnerability Analysis for Tornado Hazard

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

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, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included as Appendix E.

Building Inventory

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

Infrastructure

During a tornado the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is 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 gauge the anticipated impacts of tornadoes in the county, in terms of numbers and types of buildings and infrastructure.

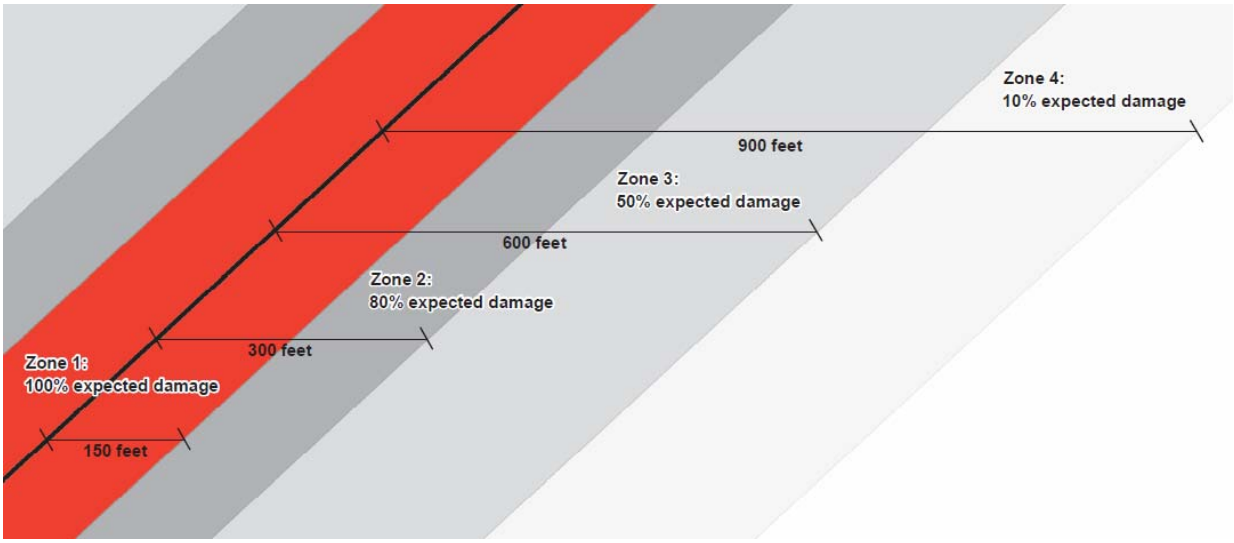
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based upon the F4 tornado event that ran for ~30 miles through Colchester, Macomb, and Bushnell. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 4-13 depicts tornado damage curves as well as path widths.

Table 4-13: Tornado Path Widths and Damage Curves

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

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 4-2 and Table 4-14 describe the zone analysis. The selected hypothetical tornado path is depicted in Figure 4-3, and the damage curve buffers are shown in Figure 4-4 and 4-5.

Figure 4-2: F4 Tornado Analysis Using GIS Buffers



An F4 tornado has four damage zones, depicted in Table 4-14. Total devastation is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will experience 10% damage.

Table 4-14: F4 Tornado Zones and Damage Curves

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

Figure 4-3: Hypothetical F4 Tornado Path in McDonough County

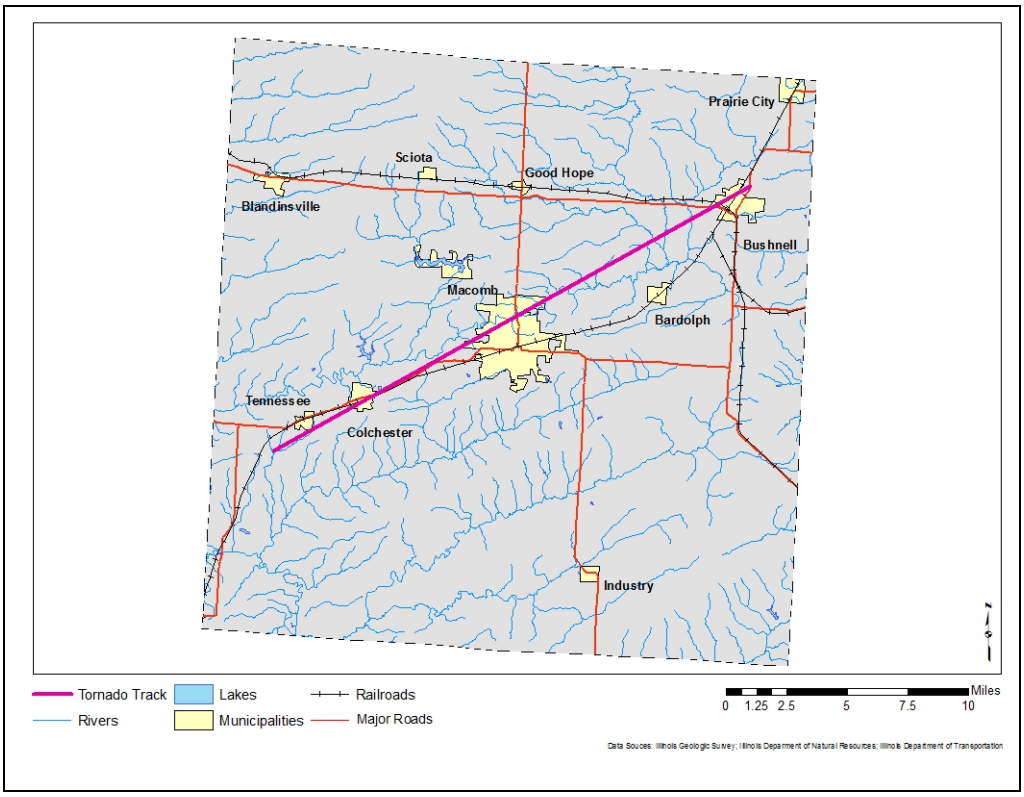


Figure 4-4: Modeled F4 Tornado Damage Buffers in McDonough County near Macomb, IL

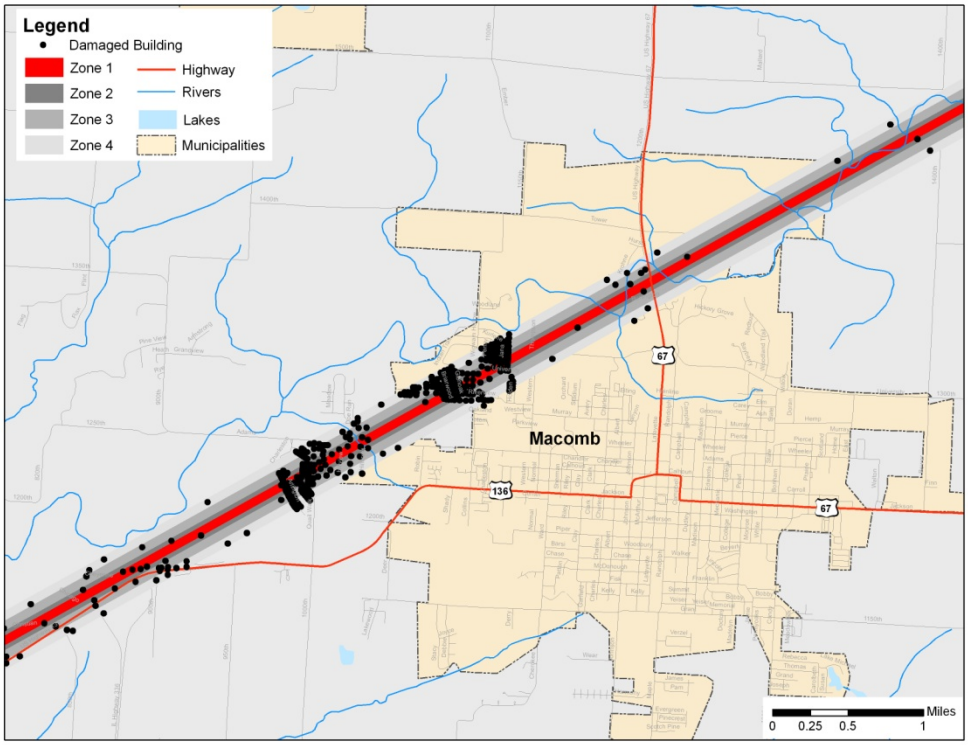
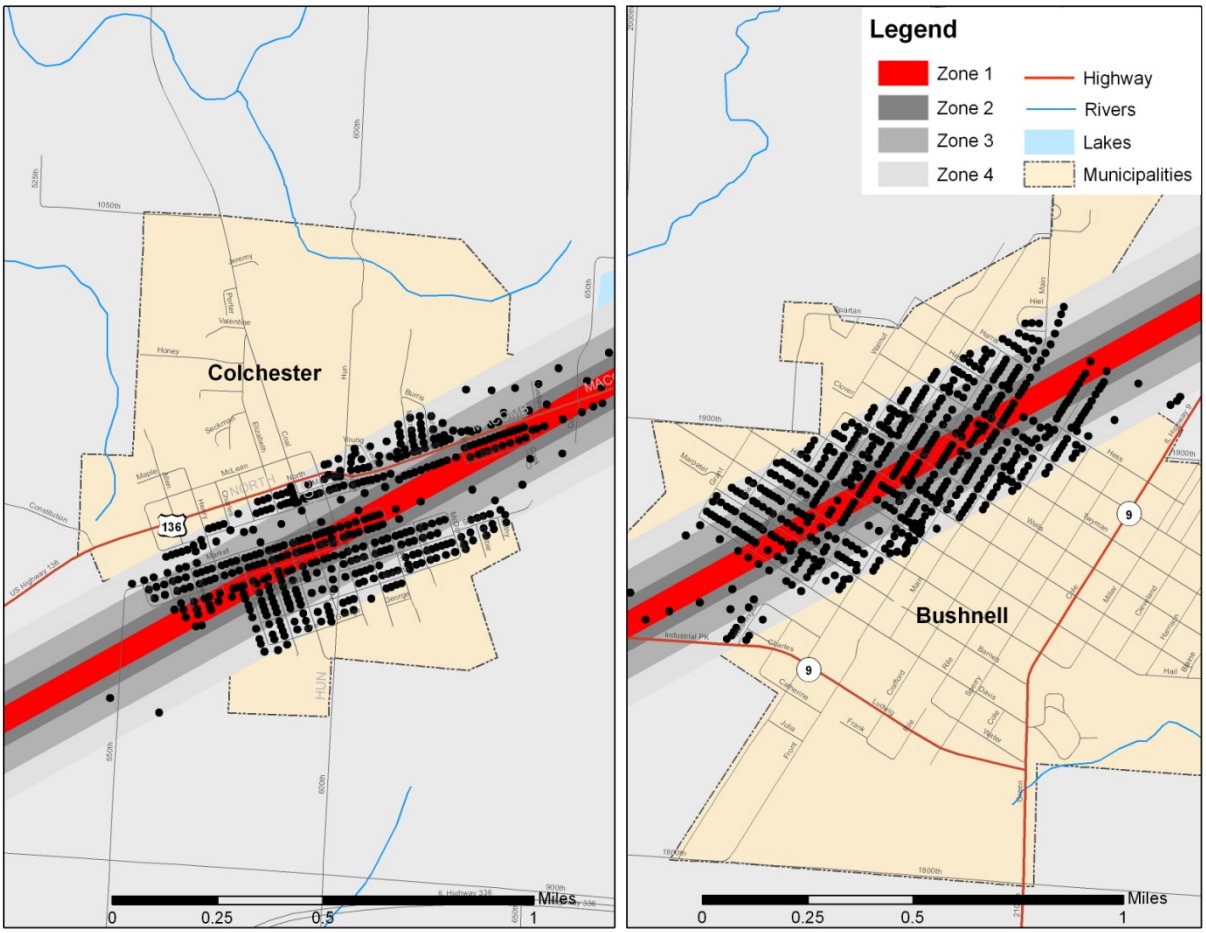


Figure 4-5: Modeled F4 Tornado Damage Buffers in McDonough County Near Colchester and Bushnell, IL



The results of the analysis are depicted in Tables 4-15 and 4-16. The GIS analysis estimates that 1,571 buildings will be damaged. The estimated building losses were $89.6 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 McDonough 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 4-15: Estimated Numbers of Buildings Damaged by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	259	228	439	439
Commercial	19	13	30	50
Industrial	2	2	6	6
Agriculture	0	0	0	0
Religious	11	10	23	30
Government	0	0	0	0
Education	0	1	2	1
Total	**291**	**254**	**500**	**526**

Table 4-16: Estimated Building Losses by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$14,563,440	$13,399,279	$13,687,521	$2,653,484
Commercial	$467,079	$546,170	$1,082,865	$738,975
Industrial	$88,398	$615,125	$672,321	$96,202
Agriculture	$0	$0	$0	$0
Religious	$0	$0	$0	$0
Government	$0	$0	$0	$0
Education	$0	$31,200,000	$9,093,750	$657,200
Total	**$15,118,917**	**$45,760,574**	**$24,536,457**	**$4,145,861**

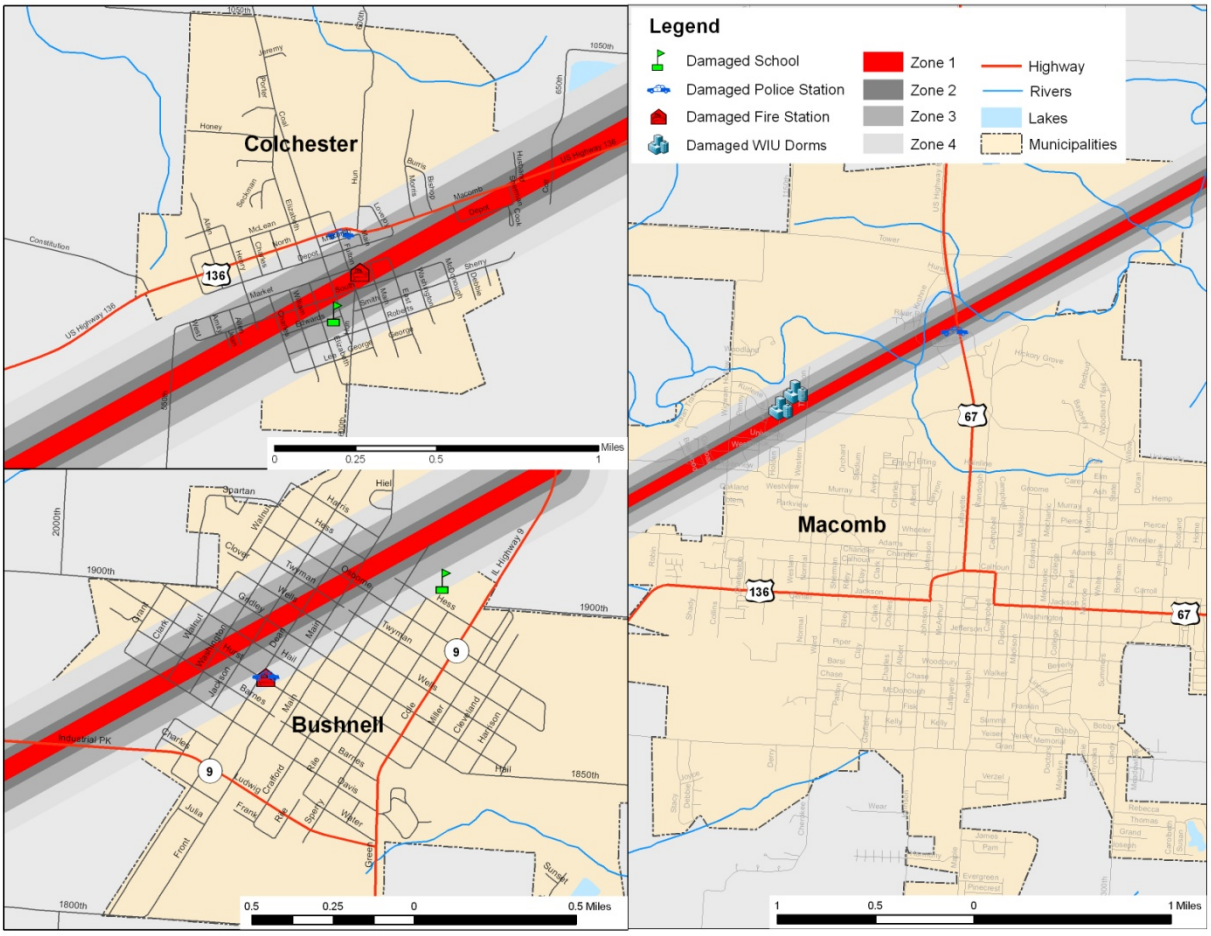
Critical Facilities Damage

There are 8 critical facilities located within 900 feet of the hypothetical tornado path. The affected facilities are identified in Table 4-17, and their geographic locations are shown in Figure 4-6.

Table 4-17: Estimated Essential Facilities Affected

Name
Fire Stations
Bushnell Fire Protection District
Colchester Fire Protection District
Police Stations
Colchester Police Department
Bushnell Police Department
School Facilities
Bushnell-Prairie City Elementary School
West Prairie South Elementary School
Western Illinois University - Thompson Hall
Western Illinois University - Higgins Hall

Figure 4-6: Essential Facilities within Tornado Path in Bushnell, Colchester, and Macomb



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, 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 McDonough County is included in Table 4-10.

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

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 warnings of

approaching storms are also vital to preventing the loss of property and ensuring the safety of McDonough County residents.

4.4.2 Flood Hazard

Hazard Definition for Flooding

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

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can 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 cannot hold back the potential energy of the water. If a dam or levee fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (of concern would be transportation routes and utility lines required to maintain or protect life), and environmental damage.

Many communities view both dams and levees as permanent and infinitely safe structures. This sense of security may well be false, leading to significantly increased risks. Both downstream of dams and on floodplains protected by levees, security leads to new construction, added

infrastructure, and increased population over time. Levees in particular are built to hold back flood waters only up to some maximum level, often the 100-year (1% annual probability) flood event. When that maximum is exceeded by more than the design safety margin, the levee will be overtopped or otherwise fail, inundating communities in the land previously protected by that levee. It has been suggested that climate change, land-use shifts, and some forms of river engineering may be increasing the magnitude of large floods and the 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 for Flooding

The NCDC database reported 39 flood events in McDonough County since 1995. These flood events have been attributed with one injury and $390,000 in property damage. One of the most recent significant events occurred during May 2009. Three days of heavy rains resulted in the La Moine River near Colmar going above moderate flood stage. The flooding resulted in several road closures and $250,000 worth of property damage.

McDonough County NCDC recorded floods are identified in Table 4-18. Pictures of some of the flood events are shown in Appendix D. Additional details of individual hazard events can be found on the NCDC website.

Table 4-18: McDonough County Previous Occurrences of Flooding*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macomb	5/16/1995	Flash Flood	N/A	0	1	0	0
McDonough County	2/20/1997	Flood	N/A	0	0	0	0
Bardolph	5/17/1999	Urban/small Stream Fled	N/A	0	0	0	0
Macomb	5/17/1999	Urban/small Stream Fled	N/A	0	0	0	0
Blandinsville	6/8/1999	Urban/small Stream Fled	N/A	0	0	0	0
Colmar	6/26/2000	Urban/small Stream Fled	N/A	0	0	0	0
Macomb	7/4/2000	Urban/small Stream Fled	N/A	0	0	0	0
Macomb	7/10/2000	Flash Flood	N/A	0	0	0	0
Blandinsville	7/31/2000	Urban/small Stream Fled	N/A	0	0	0	0
Countywide	2/24/2001	Urban/small Stream Fled	N/A	0	0	0	0
Bushnell	8/3/2001	Flash Flood	N/A	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macomb	8/23/2001	Urban/small Stream Fled	N/A	0	0	0	0
Countywide	5/11/2002	Flash Flood	N/A	0	0	0	0
McDonough County	5/11/2002	Flood	N/A	0	0	0	0
Bushnell	5/12/2002	Flash Flood	N/A	0	0	0	0
Macomb	6/11/2002	Flash Flood	N/A	0	0	0	0
Countywide	6/11/2002	Flash Flood	N/A	0	0	0	0
Good Hope	6/13/2002	Flash Flood	N/A	0	0	0	0
Prairie City	6/13/2002	Flash Flood	N/A	0	0	0	0
Macomb	6/25/2003	Flash Flood	N/A	0	0	20K	0
McDonough County	5/24/2004	Flood	N/A	0	0	0	0
McDonough County	8/27/2004	Flood	N/A	0	0	0	6K
McDonough County	9/16/2004	Flood	N/A	0	0	0	10K
McDonough County	10/23/2004	Flood	N/A	0	0	0	0
McDonough County	11/1/2004	Flood	N/A	0	0	0	0
McDonough County	12/7/2004	Flood	N/A	0	0	0	0
McDonough County	1/4/2005	Flood	N/A	0	0	0	0
McDonough County	1/12/2005	Flood	N/A	0	0	0	0
McDonough County	2/14/2005	Flood	N/A	0	0	0	0
Macomb	5/31/2006	Flash Flood	N/A	0	0	5K	0
Blandinsville	6/22/2007	Flash Flood	N/A	0	0	0	0
Macomb	6/22/2007	Flash Flood	N/A	0	0	0	0
Macomb	6/22/2007	Flash Flood	N/A	0	0	0	0
Blandinsville	6/22/2007	Flash Flood	N/A	0	0	0	0
Colchester	6/22/2007	Flash Flood	N/A	0	0	0	0
Industry	7/27/2008	Flash Flood	N/A	0	0	15K	0
Blandinsville	5/1/2009	Flood	N/A	0	0	100K	0
Blandinsville	5/15/2009	Flood	N/A	0	0	250K	0
Industry	5/15/2009	Flood	N/A	0	0	0	0

* 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 Failure

According to the McDonough 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 NFIP, which has suffered flood loss damage on two 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.

The Illinois Emergency Management Agency (IEMA) was contacted to determine the location of repetitive loss structures in McDonough County. IEMA reported that there were no repetitive loss structures in McDonough, County.

Geographic Location for Flooding

Most river flooding occurs in spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Severe thunderstorms may cause flooding during the summer or fall, but tend to be localized.

Flash floods, brief heavy flows in small streams or normally dry creek beds, also occur within the county. Flash flooding is typically characterized by high-velocity water, often carrying large amounts of debris. Urban flooding involves the overflow of storm drain systems and is typically the result of inadequate drainage following heavy rainfall or rapid snowmelt.

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.

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers across the United States. For McDonough County, no data is provided.

Geographic Location for Dam and Levee Failure

The National Inventory of Dams identified 21 dams in McDonough County. The maps in Appendix E illustrate the locations of McDonough dams. Of these 22 dams, there is one high hazard dam, four significant hazard dams, and 16 low hazard dams. Eight of these dams have emergency action plan (EAP). Table 4-19 summarizes the dam information.

Table 4-19: National Inventory of Dams

Dam Name	River	Hazard	EAP
Irish Lake Dam	Tributary of East Fork of La Moine River	L	N
McClare East Pond Dam	Tributary of East Fork of La Moine River	S	N
Blandinsville City Reservoir Dam	Tributary to Little Creek	H	Y
Vermont City Reservoir Dam	Tributary to Sugar Creek	S	N
Patrick Lake Dam	Tributary to Troublesome Creek	S	Y
Freeman United /Industry/Structure Dam 4	Tributary to Grindstone Creek	L	N
Freeman United /Industry/Structure Dam 3	Tributary to Grindstone Creek	L	N
Freeman United /Industry/Structure Dam 1	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Structure Dam 7	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Structure Dam 6	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Structure Dam 2	Tributary to Grindstone Creek	L	N
Freeman United /Industry/Structure Dam 3S	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Structure Dam 28	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Structure Dam 22	Tributary to Grindstone Creek	L	Y
Freeman United /Industry/Incline Pond	Tributary to Grindstone Creek	L	N
Freeman United /Industry/Structure Dam 21	Tributary to Grindstone Creek	L	N

Dam Name	River	Hazard	EAP
Blandisville Storage 2 Dam	Tributary to Laharpe Creek	L	N
Freeman United /Industry/Structure Dam 18	Tributary to Grindstone Creek	L	N
Freeman United /Industry/Structure Dam 20	Tributary to Grindstone Creek	L	N
Spring Lake Dam	Spring Creek	L	N
Cricket Wood Green Lake Dam	Tributary to Troublesome Creek	S	NR

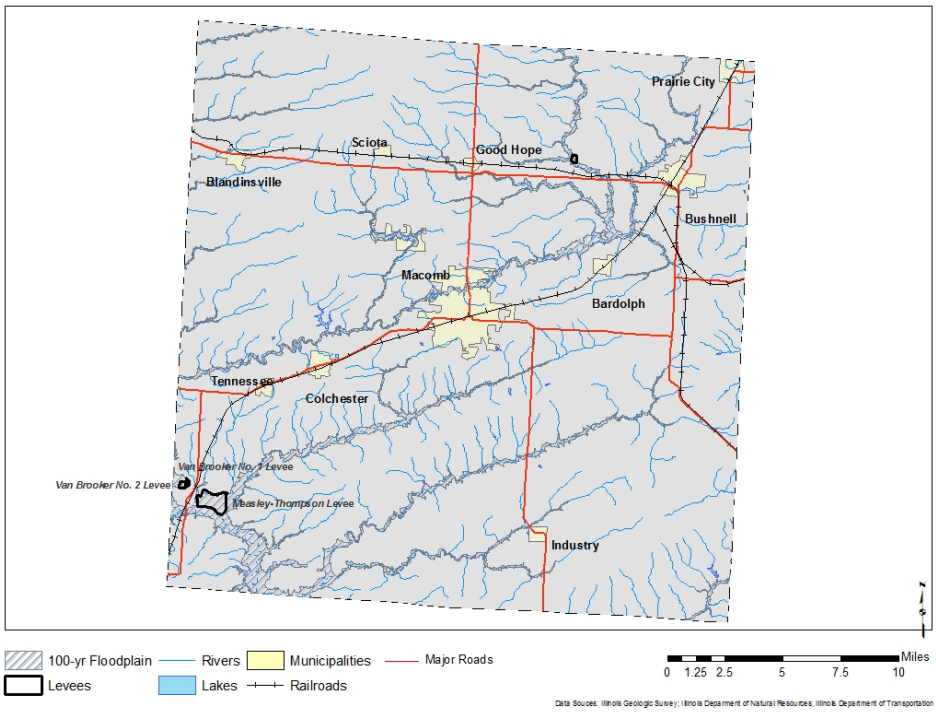
* The dams listed in this multi-hazard mitigation plan are recorded from default HAZUS-MH data. Their physical presences were not confirmed; therefore, new or unrecorded structures may exist. A more complete list of locations and attributes is included in Appendix E. L= Low Hazard Dam, S = Significant Hazard Dam, Y = Yes, N = No, NR = not required.

A review of the United States Army Corps of Engineers and local records revealed four levees within McDonough County. Three of these levees are located along the La Moine River and the other is located along the East Fork of the La Moine River. All these levees are considered agricultural levees which have protection levels that range from 5 to 10-year flood event and are not intended to protect lives and non-agricultural property. Table 4-20 lists the levees and their approximate locations are shown of Figure 4-7.

Table 4-20: List of Levees in McDonough County

Name	River	Sponsorship	Area Protected (Acres)	Protection Level	Certification	
					PL 84 99 (USACE)	FEMA
Bradford Levee	East Fork of the La Moine River	None	50	5	No	No
Van Brooker NO.1 Levee	La Moine River	None	40	10	No	No
Van Brooker NO.1 Levee	La Moine River	None	55	5	No	No
Measley-Thompson Levee	La Moine River	None	500	5	No	No

Figure 4-7 Location on Levees in McDonough County



Hazard Extent for Flooding

The HAZUS-MH flood model is designed to generate a flood depth grid and flood boundary polygon by deriving hydrologic and hydraulic information based on user-provided elevation data or by incorporating selected output from other flood models. HAZUS-MH also has the ability to clip a Digital Elevation Model (DEM) with a user-provided flood boundary, thus creating a flood depth grid. For McDonough County, HAZUS-MH was used to extract flood depth by clipping the DEM with the IDNR FIRMs Base Flood Elevation (BFE) boundary. The BFE is defined as the area that has a 1% chance of flooding in any given year.

Flood hazard scenarios were modeled using GIS analysis and HAZUS-MH. The flood hazard modeling was based on historical occurrences and current threats. Existing flood maps were used to identify the areas of study. These digital files, although not official FIRMs, provided the boundary which was the basis for this analysis. Planning team input and a review of historical information provided additional information on specific flood events.

Risk Identification for Flood Hazard

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

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	1	=	3

HAZUS-MH Analysis Using 100-Year Flood Boundary and County Parcels

HAZUS-MH generated the flood depth grid for a 100-year return period by clipping the 1/3-ArcSecond (approximately 10 meters) Digital Elevation Model (DEM) to the McDonough County flood boundary. Next, HAZUS-MH utilized a user-defined analysis of McDonough County with site-specific parcel data provided by the county.

HAZUS-MH estimates the 100-year flood would damage 54 buildings at a replacement cost of $3.4 million. The total estimated numbers of damaged buildings are given in Table 4-21. Figure 4-8 depicts the McDonough County parcel points that fall within the 100-year floodplain. Figures 4-8 and 4-9 highlight damaged buildings within the floodplain areas in McDonough County and the City of Macomb.

Table 4-21: McDonough County HAZUS-MH Building Damage

General Occupancy	Number of Buildings Damaged	Total Building Damage (x1000)
Residential	133	$3,367,589
Commercial	0	$0
Industrial	0	$0
Agricultural	0	$0
Religious	0	$0
Government	1	$0
Education	0	$0
Total	**54**	$3,367,589

Figure 4-8: McDonough County Buildings in Floodplain (100-Year Flood)

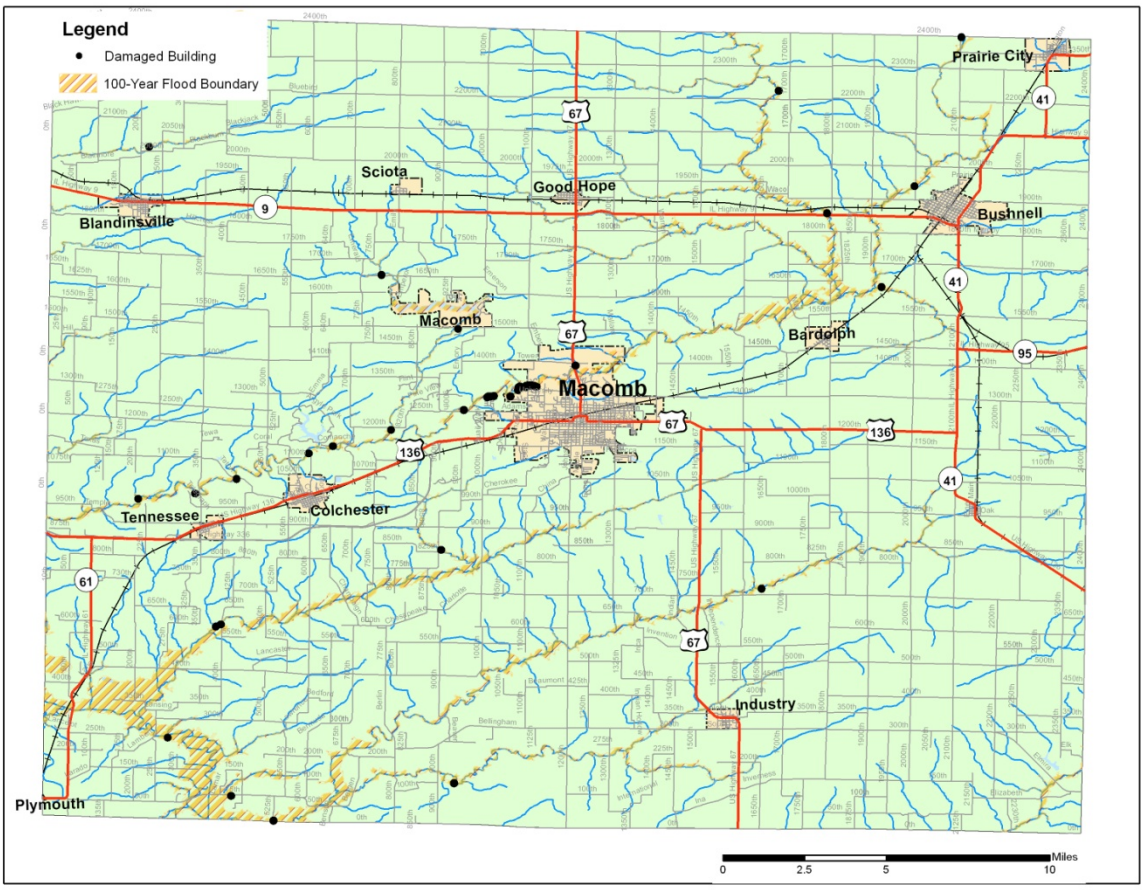
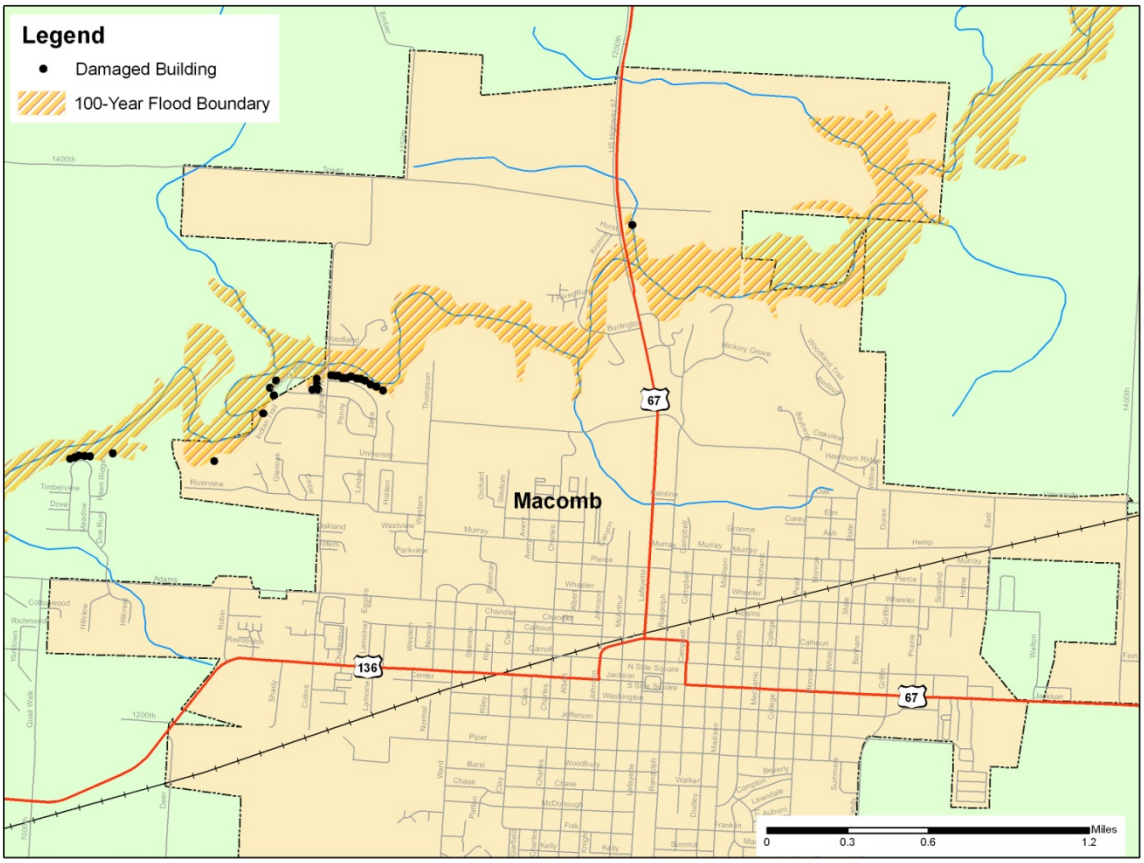


Figure 4-9: McDonough County Urban Areas (Macomb) Flood-Prone Areas (100-Year Flood)



Critical Facilities

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

The analysis identified no critical facilities that are subject to downstream flooding.

Infrastructure

The types of infrastructure that could be impacted by a flood include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of a flood. The impacts to these items include broken, failed, or impassable

roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could also fail or become impassable, causing traffic risks.

Vulnerability Analysis for Flash Flooding

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

A map and list of all critical facilities is included as Appendix F.

Vulnerability to Future Assets/Infrastructure for Flooding

Flash flooding could affect any low lying location or areas of poor drainage within this jurisdiction; therefore, a significant portion of county's population and buildings are vulnerable to a flash flood. Currently, the McDonough County planning commission 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.

Analysis of Community Development Trends

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

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, the forces of plate tectonics have shaped Earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing 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 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 shows 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 huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill 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.

The possibility of the occurrence of a catastrophic earthquake in the central and eastern United States is real as evidenced by history and described throughout this section. The impacts of significant earthquakes affect large areas, terminating public services and systems needed to aid the suffering and displaced. These impaired systems are interrelated in the hardest struck zones. Power lines, water and sanitary lines, and public communication may be lost; and highways, railways, rivers, and ports may not allow transportation to the affected region. Furthermore, essential facilities, such as fire and police departments and hospitals, may be disrupted if not previously improved to resist earthquakes.

As with hurricanes, mass relocation may be necessary, but the residents who are suffering from the earthquake can neither leave the heavily impacted areas nor receive aid or even communication in the aftermath of a significant event.

Magnitude, which is determined from measurements on seismographs, measures the energy released at the source of the earthquake. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. Earthquake magnitudes and their corresponding intensities are listed in tables 4-22 and 4-23.

Source: http://earthquake.usgs.gov/learning/topics/mag_vs_int.php

Table 4-22: 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.
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 4-23: 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

Previous Occurrences for Earthquake Hazard

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 northern Illinois—as of the date of this report—occurred on February 10, 2010 at 3:59:35 local time about 3.0 km (2 miles) east-northeast of Virgil, IL and measured 3.8 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, although concentrated in Southern Illinois.

Seismic activity on the New Madrid Seismic Zone of southeastern Missouri is very significant both historically and at present. 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 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*]

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 minor injuries 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 Olmsted, 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 antenna, 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.

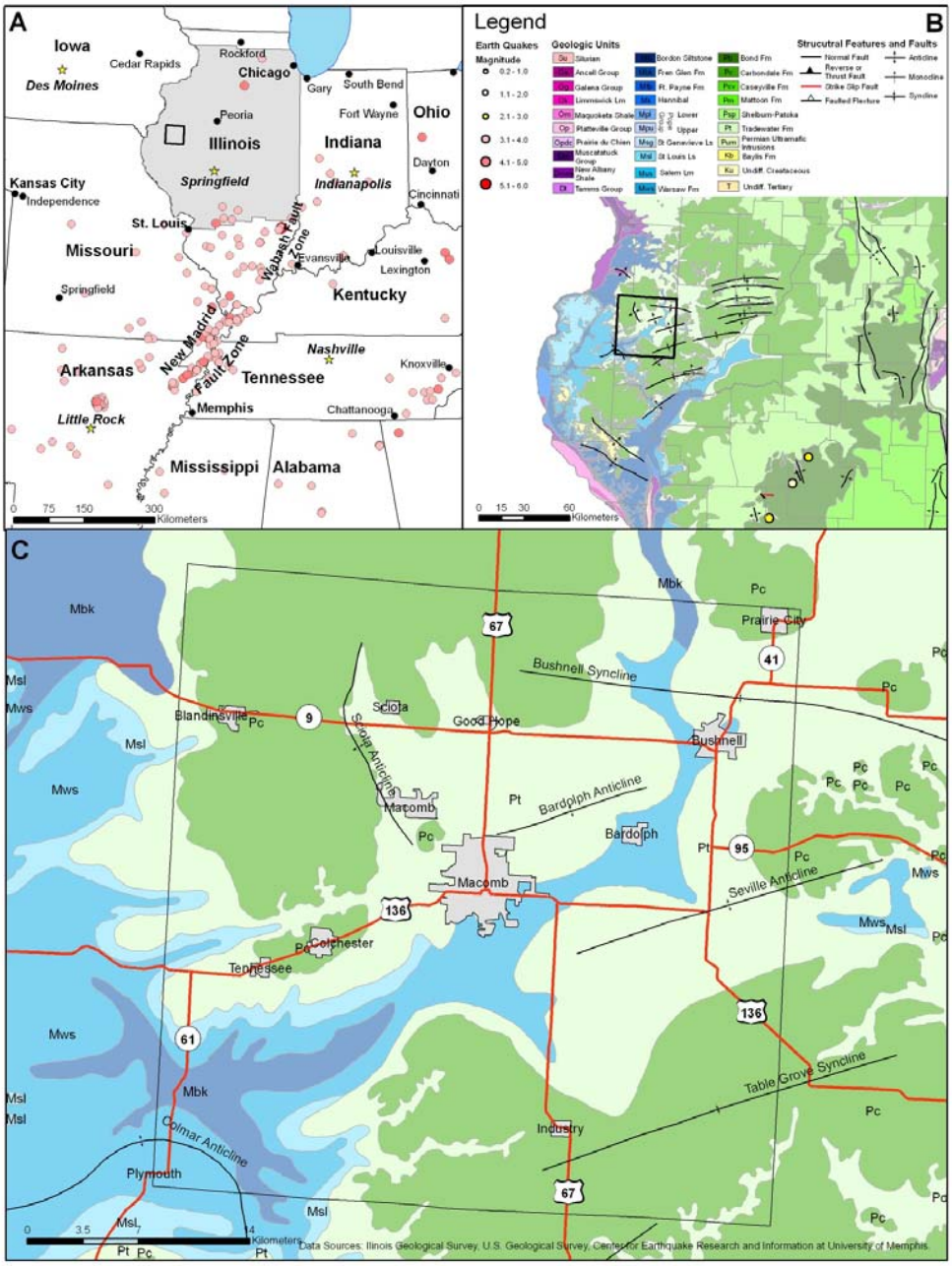
Above text adapted from http://earthquake.usgs.gov/regional/states/illinois/history.php and from Seismicity of the United States, 1568-1989 (Revised), C.W. Stover and J.L. Coffman, U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington: 1993.

Geographic Location for Earthquake Hazard

Within Illinois, the two most significant zones of seismic activity are the New Madrid Seismic Zone and the Wabash Valley Fault System. There have been no earthquake epicenters recorded in McDonough County since 1974.

Figure 4-10 depicts the following: a) Location of notable earthquakes in the Illinois region with inset of McDonough County; b) Generalized geologic bedrock map with earthquake epicenters, geologic structures, and inset of McDonough County; c) Geologic and earthquake epicenter map of McDonough County.

Figure 4-10 a, b, c: McDonough County Earthquakes



Hazard Extent for Earthquake Hazard

The extent of the earthquake is countywide. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. A National Earthquake Hazards Reduction Program (NEHRP) compliant soils map was used for the analysis which was provided by FEMA. The map identifies the soils most susceptible to failure.

Calculated Risk Priority Index for Earthquake Hazard

Based on historical information as well as current USGS and SIUC research and studies, future earthquakes in McDonough County are possible but, large (>5.5 M) earthquakes that would cause catastrophic damage are unlikely. Severe to catastrophic earthquake damage is unlikely because of the large distance (>200 miles) between McDonough County and nearest the major seismic zones, the New Madrid Seismic Zone and the Wabash Valley Fault Zone. According to the McDonough County planning team's RPI assessment, earthquake is ranked as the number eight hazard.

RPI = Probability x Magnitude/Severity.

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

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. a damaged police station will no longer be able to serve the community). A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can 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 residents to seek shelter).

Infrastructure

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

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

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

The following earthquake hazard modeling scenarios were performed:

- 5.5 magnitude earthquake local epicenter
- 500-year return period event

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. Fortunately, a National Earthquake Hazards Reduction Program (NEHRP) soil classification map exists for Illinois. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking. FEMA provided a soils map and liquefaction potential map that was used in HAZUS-MH.

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

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

Results for 5.5 Magnitude Earthquake in McDonough County

The results of the initial analysis, the 5.5 magnitude earthquake with an epicenter in the City of Macomb, are depicted in Tables 4-24 and 4-25 and Figure 4-11. HAZUS estimates that approximately 1,811 buildings will be at least moderately damaged. This is more than 12% of the total number of buildings in the region. It is estimated that 64 buildings will be damaged beyond repair.

The total building related losses totaled $180.2 million; 16% 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 61% of the total loss.

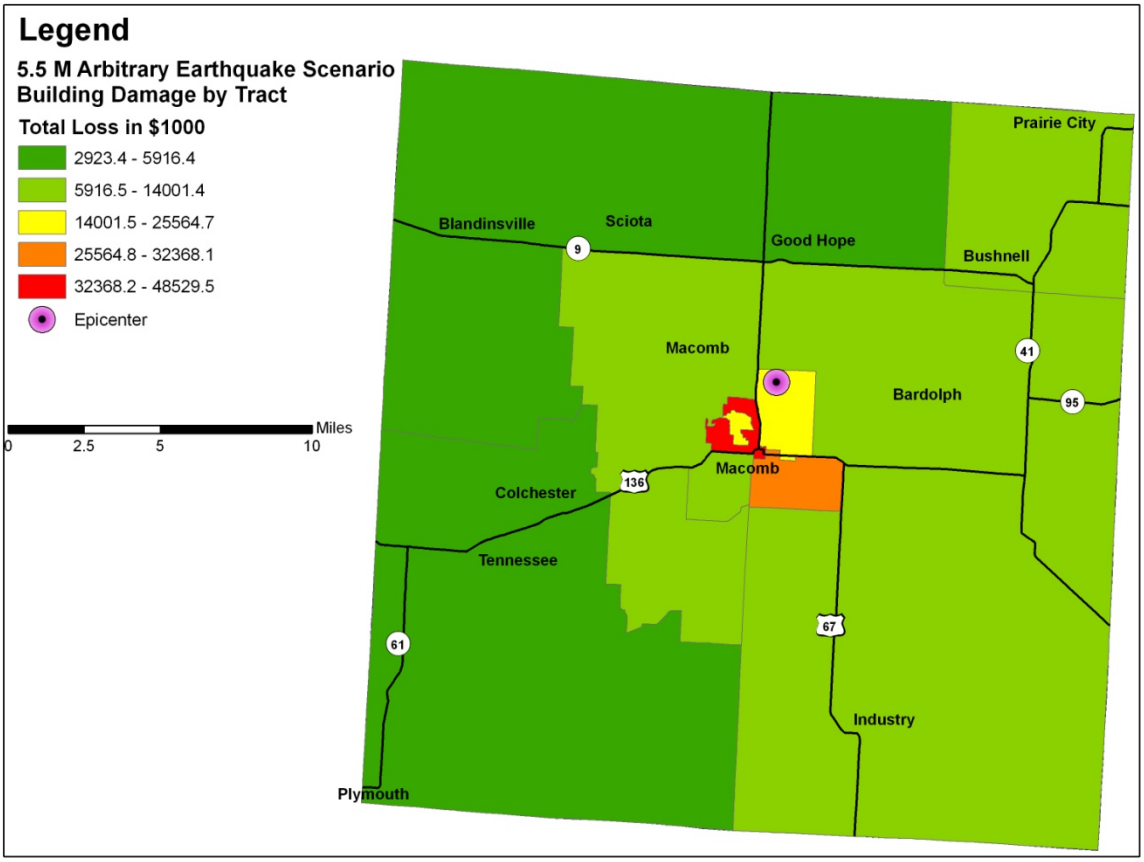
Table 4-24: McDonough County 5.5M Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	160	1.53	38	1.32	29	2.03	9	2.54	1	1.52
Commercial	429	4.12	147	5.08	110	7.81	35	10.56	6	9.19
Education	21	0.20	6	0.22	5	0.35	2	0.45	0	0.54
Government	25	0.24	6	0.22	5	0.32	1	0.34	0	0.38
Industrial	128	1.23	35	1.20	26	1.84	8	2.37	1	1.64
Other Residential	2,793	26.82	866	29.90	494	34.97	109	32.60	19	29.18
Religion	54	0.52	17	0.59	12	0.88	4	1.25	1	1.31
Single Family	6,805	65.34	1,781	61.46	731	51.79	167	49.88	36	56.25
Total	**10,414**		**2,897**		**1,411**		**336**		**64**	

Table 4-25: McDonough County 5.5M Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.38	5.02	0.21	0.47	6.07
	Capital-Related	0.00	0.16	4.01	0.12	0.14	4.44
	Rental	1.18	2.60	2.08	0.07	0.21	6.15
	Relocation	4.36	1.71	3.67	0.30	1.95	11.99
	Subtotal	**5.55**	**4.84**	**14.78**	**0.71**	**2.78**	**28.66**
Capital Stock Loses							
	Structural	6.28	6.35	3.90	0.76	1.82	19.11
	Non_Structural	28.74	32.59	15.16	3.69	6.21	86.40
	Content	13.79	11.79	11.17	2.91	5.19	44.85
	Inventory	0.00	0.00	0.30	0.74	0.11	1.15
	Subtotal	**48.81**	**50.73**	**30.53**	**8.10**	**13.33**	**151.51**
	Total	**54.36**	**55.58**	**45.31**	**8.81**	**16.12**	**180.17**

Figure 4-11: McDonough County 5.5M Scenario-Building Economic Losses in $1,000s of Dollars



McDonough County 5.5M Scenario—Essential Facility Losses

Before the earthquake, the region had 487 care beds available for use. On the day of the earthquake, the model estimates that only 28 care beds (6%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 59% of the beds will be back in service. By day 30, 84% will be operational.

500-Year Probabilistic Scenario Results

The results of the 500-year probabilistic analysis are depicted in Tables 4-26 and 4-27. HAZUS-MH estimates that approximately 111 buildings will be at least moderately damaged. This is more than 1% of the total number of buildings in the region. It is estimated that seven buildings will be damaged beyond repair. The total building-related losses totaled $3.92 million; 34% 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 54% of the total loss.

Table 4-26: 500-Year Probabilistic Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	224	1.53	8	2.45	3	3.11	0	3.84	0	2.08
Commercial	693	4.72	25	7.50	8	8.51	1	10.40	0	6.94
Education	32	0.22	1	0.35	0	0.41	0	0.49	0	0.51
Government	36	0.24	1	0.32	0	0.36	0	0.40	0	0.39
Industrial	188	1.28	7	2.04	2	2.44	0	2.95	0	1.46
Other Residential	4,124	28.10	117	35.05	37	37.33	3	25.62	0	23.93
Religion	85	0.58	3	0.88	1	1.09	0	1.38	0	1.22
Single Family	9,296	63.33	171	51.42	47	46.74	6	54.93	1	63.46
Total	**14,678**		**333**		**100**		**11**		**1**	

Table 4-27: 500-Year Probabilistic Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.01	0.22	0.02	0.03	0.28
	Capital-Related	0.00	0.00	0.18	0.01	0.01	0.20
	Rental	0.06	0.09	0.12	0.01	0.01	0.28
	Relocation	0.22	0.07	0.17	0.02	0.09	0.58
	Subtotal	**0.28**	**0.18**	**0.69**	**0.06**	**0.14**	**1.35**
Capital Stock Loses							
	Structural	0.33	0.23	0.19	0.07	0.11	0.93
	Non_Structural	0.58	0.37	0.23	0.07	0.12	1.38
	Content	0.08	0.04	0.07	0.04	0.04	0.26
	Inventory	0.00	0.00	0.00	0.01	0.00	0.01
	Subtotal	**1.00**	**0.65**	**0.48**	**0.18**	**0.26**	**2.57**
	Total	**1.28**	**0.83**	**1.17**	**0.24**	**0.40**	**3.92**

500-Year Probabilistic Scenario—Essential Facility Losses

Before the earthquake, the region had 487 care beds available for use. On the day of the earthquake, the model estimates that only 323 care beds (67%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 98% of the beds will be back in service. By day 30, 100% will be operational.

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

New construction, especially critical facilities, 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 that is susceptible to liquefaction.

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

4.4.4 Thunderstorm Hazard

Hazard Definition for Thunderstorm Hazard

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

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

Hail

Hail is a product of a strong thunderstorm. Hail usually falls near the center of a storm, however strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, resulting in damage in other areas near the storm. Hailstones range from pea-sized to baseball-sized, 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 105 hail storms in McDonough County since 1973. These hail storms have been attributed with $87,000 in property damage. Hail storms occur nearly every year in the late spring and early summer months. The most recent reported occurrence was in June 2009 when severe thunderstorms produced large hail and wind gusts over 58 mph.

McDonough County hail storms are identified in Table 4-28. Pictures of some of the thunderstorm events are shown in Appendix D. Additional details of individual hazard events can be found on the NCDC website.

Table 4-28: McDonough County Hail Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
McDonough County	4/30/1973	Hail	1.00 in.	0	0	0	0
McDonough County	8/8/1973	Hail	1.75 in.	0	0	0	0
McDonough County	4/3/1974	Hail	0.75 in.	0	0	0	0
McDonough County	6/20/1974	Hail	1.75 in.	0	0	0	0
McDonough County	6/21/1974	Hail	1.75 in.	0	0	0	0
McDonough County	6/21/1974	Hail	2.75 in.	0	0	0	0
McDonough County	6/21/1974	Hail	0.75 in.	0	0	0	0
McDonough County	3/26/1976	Hail	0.75 in.	0	0	0	0
McDonough County	3/26/1976	Hail	1.50 in.	0	0	0	0
McDonough County	3/26/1976	Hail	1.50 in.	0	0	0	0
McDonough County	6/2/1980	Hail	1.00 in.	0	0	0	0
McDonough County	6/2/1980	Hail	1.75 in.	0	0	0	0
McDonough County	6/2/1980	Hail	2.75 in.	0	0	0	0
McDonough County	6/8/1981	Hail	1.75 in.	0	0	0	0
McDonough County	4/23/1985	Hail	1.00 in.	0	0	0	0
McDonough County	5/6/1986	Hail	1.75 in.	0	0	0	0
McDonough County	5/21/1987	Hail	1.75 in.	0	0	0	0
McDonough County	4/5/1988	Hail	1.50 in.	0	0	0	0
McDonough County	6/26/1989	Hail	1.75 in.	0	0	0	0
McDonough County	6/7/1990	Hail	1.00 in.	0	0	0	0
McDonough County	8/29/1990	Hail	0.75 in.	0	0	0	0
McDonough County	3/26/1991	Hail	0.75 in.	0	0	0	0
McDonough County	5/17/1991	Hail	0.75 in.	0	0	0	0
McDonough County	10/23/1991	Hail	2.00 in.	0	0	0	0
McDonough County	6/23/1992	Hail	1.75 in.	0	0	0	0
McDonough County	6/23/1992	Hail	1.75 in.	0	0	0	0
Colmar	8/18/1993	Hail	1.00 in.	0	0	0	0
Blandinsville	7/20/1994	Hail	1.00 in.	0	0	0	0
Macomb	4/7/1995	Hail	1.75 in.	0	0	0	0
Macomb	4/7/1995	Hail	0.75 in.	0	0	0	0
Good Hope	4/9/1995	Hail	0.75 in.	0	0	0	0
Colchester	4/10/1995	Hail	0.75 in.	0	0	0	0
Colchester	4/10/1995	Hail	0.75 in.	0	0	0	0
Macomb	4/10/1995	Hail	1.75 in.	0	0	0	0
Macomb	5/13/1995	Hail	4.00 in.	0	0	0	0
Macomb	5/13/1995	Hail	4.00 in.	0	0	0	0
Fandon	5/13/1995	Hail	3.00 in.	0	0	0	0
Macomb	5/13/1995	Hail	2.75 in.	0	0	0	0
Colchester	4/18/1996	Hail	1.75 in.	0	0	0	0
Macomb	4/18/1996	Hail	1.75 in.	0	0	0	0
Bushnell	4/18/1996	Hail	1.00 in.	0	0	0	0
Bushnell	4/18/1996	Hail	1.50 in.	0	0	0	0
Colchester	4/15/1998	Hail	1.00 in.	0	0	0	0
Colchester	5/12/1998	Hail	1.00 in.	0	0	0	0

Adair	5/12/1998	Hail	1.75 in.	0	0	0	0
Blandinsville	5/19/1998	Hail	1.25 in.	0	0	0	0
Colchester	5/23/1998	Hail	1.00 in.	0	0	0	0
Prairie City	8/26/2000	Hail	1.00 in.	0	0	0	0
Colmar	4/5/2001	Hail	0.75 in.	0	0	0	0
Fandon	4/5/2001	Hail	0.88 in.	0	0	0	0
Macomb	4/5/2001	Hail	1.00 in.	0	0	0	0
Macomb	4/5/2001	Hail	1.75 in.	0	0	0	0
Macomb	4/5/2001	Hail	0.75 in.	0	0	0	0
Macomb	4/5/2001	Hail	0.75 in.	0	0	0	0
Macomb	7/17/2001	Hail	0.75 in.	0	0	0	0
Blandinsville	6/4/2002	Hail	1.00 in.	0	0	0	0
Fandon	7/26/2002	Hail	0.88 in.	0	0	0	0
Fandon	7/26/2002	Hail	1.00 in.	0	0	0	0
Macomb	7/9/2003	Hail	0.75 in.	0	0	15K	0
Macomb	7/18/2003	Hail	0.75 in.	0	0	20K	0
Tennessee	7/18/2003	Hail	0.75 in.	0	0	20K	2K
Macomb	9/26/2003	Hail	0.88 in.	0	0	0	0
Macomb	5/24/2004	Hail	0.88 in.	0	0	0	5K
Blandinsville	5/30/2004	Hail	1.00 in.	0	0	0	3K
Adair	3/30/2005	Hail	0.88 in.	0	0	0	0
Good Hope	9/19/2005	Hail	1.00 in.	0	0	1K	0
Bushnell	9/19/2005	Hail	1.00 in.	0	0	3K	0
Macomb	11/5/2005	Hail	0.88 in.	0	0	0	0
Tennessee	3/11/2006	Hail	1.25 in.	0	0	4K	0
Macomb	3/11/2006	Hail	0.88 in.	0	0	0	0
Macomb	3/11/2006	Hail	1.00 in.	0	0	3K	0
Colchester	3/11/2006	Hail	0.88 in.	0	0	0	0
Macomb	3/11/2006	Hail	1.00 in.	0	0	0	0
Prairie City	3/11/2006	Hail	0.75 in.	0	0	0	0
Blandinsville	4/2/2006	Hail	1.75 in.	0	0	10K	0
Macomb	4/2/2006	Hail	0.88 in.	0	0	1K	0
Walnut Grove	4/6/2006	Hail	0.75 in.	0	0	0	0
Industry	4/14/2006	Hail	0.88 in.	0	0	0	0
Bushnell	4/18/2006	Hail	0.75 in.	0	0	0	0
Macomb	5/24/2006	Hail	0.75 in.	0	0	0	0
Macomb	5/24/2006	Hail	0.88 in.	0	0	0	0
Macomb	5/24/2006	Hail	0.88 in.	0	0	2K	0
Macomb	6/22/2006	Hail	1.00 in.	0	0	8K	0
Colchester	6/22/2006	Hail	0.75 in.	0	0	0	0
Macomb	6/22/2006	Hail	0.75 in.	0	0	0	0
Prairie City	7/19/2006	Hail	0.88 in.	0	0	0	0
Blandinsville	7/19/2006	Hail	0.88 in.	0	0	0	2K
Bushnell	9/11/2006	Hail	0.75 in.	0	0	0	0
Tennessee	3/1/2007	Hail	0.75 in.	0	0	0	0
Blandinsville	3/1/2007	Hail	0.75 in.	0	0	0	0
Scottsburg	3/1/2007	Hail	0.75 in.	0	0	0	0
Macomb Muni Arpt	3/1/2007	Hail	0.75 in.	0	0	0	0

Bushnell	3/1/2007	Hail	0.75 in.	0	0	0	0
Macomb	3/1/2007	Hail	0.88 in.	0	0	0	0
Bushnell	3/1/2007	Hail	0.75 in.	0	0	0	0
Macomb Muni Arpt	3/1/2007	Hail	0.75 in.	0	0	0	0
Tennessee	6/21/2007	Hail	1.00 in.	0	0	0	0
Tennessee	6/21/2007	Hail	0.88 in.	0	0	0	0
Prairie City	5/2/2008	Hail	0.75 in.	0	0	0	0
Adair	5/13/2008	Hail	1.00 in.	0	0	0	0
Macomb	5/25/2008	Hail	0.88 in.	0	0	0	0
Bushnell	5/25/2008	Hail	0.88 in.	0	0	0	0
Macomb	5/25/2008	Hail	1.00 in.	0	0	0	0
Colmar	6/15/2008	Hail	0.75 in.	0	0	0	0
Adair	6/1/2009	Hail	1.00 in.	0	0	0	0

* 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 three occurrences of significant lightning strikes in McDonough County since 1959. Two lightning strikes occurred in Macomb, Illinois, one in August 2001 and one in August 2006, and one lightning strike occurred in Bushnell, Illinois, in July 2004. Property damage from these lightning strikes is estimated at $3,000.

The NCDC database identified 150 wind storms reported since 1969, the most recent of which was reported in August 2009 when storms produced wind gusts between 60 and 70 miles per hour.

As shown in Table 4-29, wind storms have historically occurred year-round with the greatest frequency and damage between May and July. The following table includes available top wind speeds for McDonough County.

Table 4-29: McDonough County Wind Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
McDonough County	7/3/1969	Tstm Wind	NM	0	0	0	0
McDonough County	7/5/1969	Tstm Wind	NM	0	0	0	0
McDonough County	2/19/1971	Tstm Wind	NM	0	0	0	0
McDonough County	2/19/1971	Tstm Wind	NM	0	0	0	0
McDonough County	2/19/1971	Tstm Wind	NM	0	0	0	0
McDonough County	5/1/1973	Tstm Wind	NM	0	0	0	0
McDonough County	10/3/1973	Tstm Wind	NM	0	0	0	0
McDonough County	6/20/1974	Tstm Wind	NM	0	0	0	0
McDonough County	6/14/1975	Tstm Wind	52 kts.	0	0	0	0
McDonough County	7/23/1975	Tstm Wind	NM	0	0	0	0
McDonough County	8/20/1975	Tstm Wind	NM	0	0	0	0
McDonough County	5/4/1977	Tstm Wind	NM	0	0	0	0
McDonough County	6/16/1977	Tstm Wind	NM	0	0	0	0
McDonough County	6/30/1978	Tstm Wind	59 kts.	0	0	0	0

McDonough County	8/18/1979	Tstm Wind	61 kts.	0	0	0	0
McDonough County	5/30/1980	Tstm Wind	57 kts.	0	0	0	0
McDonough County	6/1/1980	Tstm Wind	NM	0	0	0	0
McDonough County	6/2/1980	Tstm Wind	61 kts.	0	0	0	0
McDonough County	7/10/1980	Tstm Wind	NM	0	0	0	0
McDonough County	8/13/1980	Tstm Wind	NM	0	0	0	0
McDonough County	9/1/1980	Tstm Wind	61 kts.	0	0	0	0
McDonough County	9/6/1980	Tstm Wind	NM	0	0	0	0
McDonough County	9/7/1980	Tstm Wind	NM	0	0	0	0
McDonough County	6/7/1982	Tstm Wind	52 kts.	0	0	0	0
McDonough County	6/7/1982	Tstm Wind	NM	0	0	0	0
McDonough County	8/24/1982	Tstm Wind	NM	0	0	0	0
McDonough County	8/24/1982	Tstm Wind	NM	0	0	0	0
McDonough County	8/24/1982	Tstm Wind	NM	0	0	0	0
McDonough County	8/24/1982	Tstm Wind	NM	0	0	0	0
McDonough County	12/27/1982	Tstm Wind	NM	0	0	0	0
McDonough County	11/1/1984	Tstm Wind	NM	0	0	0	0
McDonough County	6/2/1987	Tstm Wind	61 kts.	0	0	0	0
McDonough County	5/8/1988	Tstm Wind	NM	0	0	0	0
McDonough County	5/8/1988	Tstm Wind	NM	0	0	0	0
McDonough County	4/27/1990	Tstm Wind	NM	0	0	0	0
McDonough County	6/13/1990	Tstm Wind	NM	0	0	0	0
McDonough County	6/19/1990	Tstm Wind	56 kts.	0	0	0	0
McDonough County	10/2/1991	Tstm Wind	NM	0	0	0	0
McDonough County	6/17/1992	Tstm Wind	NM	0	0	0	0
McDonough County	7/2/1992	Tstm Wind	NM	0	0	0	0
McDonough County	9/7/1992	Tstm Wind	NM	0	0	0	0
McDonough County	9/9/1992	Tstm Wind	NM	0	0	0	0
Blandinsville	8/18/1993	Tstm Wind	NM	0	0	1K	1K
Colmar	8/18/1993	Tstm Wind	NM	0	0	0	0
Macomb	8/28/1993	Tstm Wind	NM	0	0	5K	0
Colchester	8/28/1993	Tstm Wind	NM	0	0	1K	0
Industry	8/28/1993	Tstm Wind	NM	0	0	1K	0
Good Hope	8/15/1995	Tstm Wind	NM	0	0	1K	0
Macomb	6/6/1996	Tstm Wind	60 kts.	0	0	0	0
Central Illinois	10/29/1996	High Wind	52 kts.	0	0	0	0
Macomb	4/5/1997	Tstm Wind	50 kts.	0	0	0	0
Central Illinois	4/6/1997	High Wind	54 kts.	0	0	1.6M	0
Blandinsville	7/19/1997	Tstm Wind	60 kts.	0	0	0	0
Sciota	7/19/1997	Tstm Wind	52 kts.	0	0	0	0
Central Illinois	9/29/1997	High Wind	52 kts.	0	1	15K	0
Colchester	3/27/1998	Tstm Wind	63 kts.	0	0	0	0
Macomb	3/27/1998	Tstm Wind	56 kts.	0	0	1K	0
Colchester	5/12/1998	Tstm Wind	50 kts.	0	0	0	0
Blandinsville	6/18/1998	Tstm Wind	NM	0	0	1K	0
Countywide	6/29/1998	Tstm Wind	70 kts.	0	0	0	0
Blandinsville	6/29/1998	Tstm Wind	95 kts.	0	0	0	0
Macomb	6/29/1998	Tstm Wind	76 kts.	0	0	0	0

Central Illinois	11/9/1998	High Wind	57 kts.	0	0	0	0
Macomb	6/4/1999	Tstm Wind	56 kts.	0	0	0	0
Macomb	8/12/1999	Tstm Wind	52 kts.	0	0	0	0
Macomb	8/12/1999	Tstm Wind	52 kts.	0	1	0	0
Blandinsville	2/29/2000	Tstm Wind	56 kts.	0	0	0	0
Blandinsville	4/20/2000	Tstm Wind	54 kts.	0	0	0	0
Colchester	7/5/2000	Tstm Wind	0 kts.	0	0	0	0
Central Illinois	2/25/2001	High Wind	50 kts.	0	0	0	0
Blandinsville	6/14/2001	Tstm Wind	51 kts.	0	0	0	0
Macomb	6/14/2001	Tstm Wind	56 kts.	0	0	0	0
Macomb	6/14/2001	Tstm Wind	52 kts.	0	0	0	0
Fandon	8/22/2001	Tstm Wind	60 kts.	0	0	0	0
Macomb	3/9/2002	Tstm Wind	52 kts.	0	0	0	0
Macomb	3/9/2002	Tstm Wind	70 kts.	0	0	0	0
Colchester	6/25/2003	Tstm Wind	60 kts.	0	0	20K	1.9M
Macomb	6/25/2003	Tstm Wind	60 kts.	0	0	20K	0
Industry	6/25/2003	Tstm Wind	60 kts.	0	0	20K	1.9M
Bushnell	6/25/2003	Tstm Wind	60 kts.	0	0	20K	1.9M
Macomb	7/9/2003	Tstm Wind	52 kts.	0	0	30K	5K
Macomb	7/9/2003	Tstm Wind	51 kts.	0	0	100K	0
Tennessee	7/18/2003	Tstm Wind	57 kts.	0	0	30K	5K
Colchester	7/18/2003	Tstm Wind	52 kts.	0	0	40K	5K
Tennessee	7/18/2003	Tstm Wind	52 kts.	0	0	40K	5K
Macomb	8/11/2003	Tstm Wind	52 kts.	0	0	3K	0
Blandinsville	5/30/2004	Tstm Wind	70 kts.	0	0	50K	10K
Macomb	6/8/2005	Tstm Wind	52 kts.	0	0	0	0
Bushnell	6/8/2005	Tstm Wind	52 kts.	0	0	10K	5K
Macomb	8/19/2005	Tstm Wind	52 kts.	0	0	5K	0
Macomb	9/8/2005	Tstm Wind	52 kts.	0	0	6K	0
Sciota	9/8/2005	Tstm Wind	52 kts.	0	0	5K	0
Tennessee	9/8/2005	Tstm Wind	52 kts.	0	0	2K	4K
Macomb	9/19/2005	Tstm Wind	52 kts.	0	0	7K	0
Adair	3/13/2006	Tstm Wind	52 kts.	0	0	1K	0
Colmar	4/2/2006	Tstm Wind	65 kts.	0	0	12K	0
Industry	4/2/2006	Tstm Wind	61 kts.	0	0	4K	0
Bushnell	4/2/2006	Tstm Wind	65 kts.	0	0	15K	0
Bushnell	4/2/2006	Tstm Wind	65 kts.	0	0	20K	0
Macomb	5/24/2006	Tstm Wind	52 kts.	0	0	5K	0
Pennington Pt	6/22/2006	Tstm Wind	52 kts.	0	0	1K	4K
Prairie City	3/31/2007	Tstm Wind	58 kts.	0	0	0	0
Blandinsville	4/10/2008	Tstm Wind	65 kts.	0	0	0	0
ILZ035	5/11/2008	High Wind	56 kts.	0	0	20K	0
ILZ035	5/11/2008	High Wind	53 kts.	0	0	0	0
Tennessee	6/3/2008	Tstm Wind	52 kts.	0	0	0	0
Macomb	6/3/2008	Tstm Wind	52 kts.	0	0	0	0
Macomb	6/3/2008	Tstm Wind	61 kts.	0	0	5K	0
Macomb	6/3/2008	Tstm Wind	52 kts.	0	0	0	0
Macomb	6/3/2008	Tstm Wind	61 kts.	0	0	0	0

Macomb	6/3/2008	Tstm Wind	61 kts.	0	0	0	0
Macomb	6/3/2008	Tstm Wind	61 kts.	0	0	0	0
Macomb	6/3/2008	Tstm Wind	61 kts.	0	0	25K	0
Industry	6/3/2008	Tstm Wind	61 kts.	0	0	25K	0
Macomb	6/15/2008	Tstm Wind	52 kts.	0	0	5K	0
Macomb Muni Arpt	6/15/2008	Tstm Wind	60 kts.	0	0	0	0
Bushnell	6/15/2008	Tstm Wind	56 kts.	0	0	0	0
Prairie City	7/21/2008	Tstm Wind	61 kts.	0	0	0	0
Macomb	7/21/2008	Tstm Wind	56 kts.	0	0	0	0
New Philadelphia	7/21/2008	Tstm Wind	61 kts.	0	0	0	0
Pennington Pt	7/21/2008	Tstm Wind	56 kts.	0	0	0	0
Macomb	12/27/2008	Tstm Wind	60 kts.	0	0	0	0
Macomb	3/8/2009	Tstm Wind	50 kts.	0	0	0	0
Macomb	3/8/2009	Tstm Wind	56 kts.	0	0	0	0
Macomb	3/8/2009	Tstm Wind	56 kts.	0	0	0	0
Industry	3/8/2009	Tstm Wind	56 kts.	0	0	0	0
Pennington Pt	3/24/2009	Tstm Wind	56 kts.	0	0	0	0
Bardolph	3/24/2009	Tstm Wind	62 kts.	0	0	0	0
Bardolph	3/24/2009	Tstm Wind	62 kts.	0	0	0	0
Bardolph	3/24/2009	Tstm Wind	62 kts.	0	0	0	0
Adair	6/1/2009	Tstm Wind	52 kts.	0	0	0	0
Macomb	6/18/2009	Tstm Wind	50 kts.	0	0	0	0
Macomb	6/18/2009	Tstm Wind	52 kts.	0	0	0	0
Tennessee	6/19/2009	Tstm Wind	54 kts.	0	0	0	0
Tennessee	6/19/2009	Tstm Wind	56 kts.	0	0	0	0
Macomb	6/19/2009	Tstm Wind	52 kts.	0	0	0	0
Macomb	6/19/2009	Tstm Wind	56 kts.	0	0	0	0
Good Hope	6/27/2009	Tstm Wind	56 kts.	0	0	50K	0
Good Hope	6/27/2009	Tstm Wind	54 kts.	0	0	0	0
Walnut Grove	6/27/2009	Tstm Wind	61 kts.	0	0	100K	0
Bushnell	6/27/2009	Tstm Wind	61 kts.	0	0	25K	0
Macomb	6/27/2009	Tstm Wind	61 kts.	0	0	0	0
Doddsville	8/4/2009	Tstm Wind	56 kts.	0	0	25K	0
Scottsburg	8/19/2009	Tstm Wind	52 kts.	0	0	0	0

* 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 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 varies in terms of the extent of the storm, the wind speed, and the size of hail stones. Thunderstorms can occur at any location within the county.

Risk Identification for Thunderstorm Hazard

Based on historical information, the occurrence of future high winds, hail, and lightning is highly likely. High winds with widely varying magnitudes are expected to happen. According to the RPI, thunderstorms and high wind damage ranked as the number 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 equally distributed threat across the entire jurisdiction; therefore, the entire county's population and all buildings are vulnerable to a severe thunderstorm and can expect the same impacts within the affected area. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in McDonough County are discussed in Table 4-10.

Critical Facilities

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

Building Inventory

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

Infrastructure

During a severe thunderstorm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is 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.

Potential Dollar Losses for Thunderstorm Hazard

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

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

It was determined that since 1999, McDonough County has incurred $825,000 in damages relating to thunderstorms, including hail, lightning, and high winds. The storm events resulting in property damage are listed in Table 4-30.

Table 4-30: McDonough County Property Damage (1999–Present)

Location or County	Date	Type	Property Damage
		1999-2002 Subtotal	$ -
Colchester	6/25/2003	Tstm Wind	$ 20,000
Macomb	6/25/2003	Tstm Wind	$ 20,000
Industry	6/25/2003	Tstm Wind	$ 20,000
Bushnell	6/25/2003	Tstm Wind	$ 20,000
Macomb	7/9/2003	Hail	$ 15,000
Macomb	7/9/2003	Tstm Wind	$ 30,000
Macomb	7/9/2003	Tstm Wind	$ 100,000
Macomb	7/18/2003	Hail	$ 20,000
Tennessee	7/18/2003	Hail	$ 20,000
Tennessee	7/18/2003	Tstm Wind	$ 30,000
Colchester	7/18/2003	Tstm Wind	$ 40,000
Tennessee	7/18/2003	Tstm Wind	$ 40,000
Macomb	8/11/2003	Tstm Wind	$ 3,000
		2003 Subtotal	$ 378,000
Blandinsville	5/30/2004	Tstm Wind	$ 50,000
		2004 Subtotal	$ 50,000
Bushnell	6/8/2005	Tstm Wind	$ 10,000
Macomb	8/19/2005	Tstm Wind	$ 5,000
Macomb	9/8/2005	Tstm Wind	$ 6,000
Sciota	9/8/2005	Tstm Wind	$ 5,000
Tennessee	9/8/2005	Tstm Wind	$ 2,000
Good Hope	9/19/2005	Hail	$ 1,000
Bushnell	9/19/2005	Hail	$ 3,000
Macomb	9/19/2005	Tstm Wind	$ 7,000
		2005 Subtotal	$ 39,000
Tennessee	3/11/2006	Hail	$ 4,000
Macomb	3/11/2006	Hail	$ 3,000
Adair	3/13/2006	Tstm Wind	$ 1,000
Blandinsville	4/2/2006	Hail	$ 10,000
Macomb	4/2/2006	Hail	$ 1,000

Location or County	Date	Type	Property Damage	
Colmar	4/2/2006	Tstm Wind	$	12,000
Industry	4/2/2006	Tstm Wind	$	4,000
Bushnell	4/2/2006	Tstm Wind	$	15,000
Bushnell	4/2/2006	Tstm Wind	$	20,000
Macomb	5/24/2006	Hail	$	2,000
Macomb	5/24/2006	Tstm Wind	$	5,000
Pennington Pt	6/22/2006	Tstm Wind	$	1,000
		2006 Subtotal	$	78,000
		2007 Subtotal	$	-
McDonough County	5/11/2008	High Wind	$	20,000
Macomb	6/3/2008	Tstm Wind	$	5,000
Macomb	6/3/2008	Tstm Wind	$	25,000
Industry	6/3/2008	Tstm Wind	$	25,000
Macomb	6/15/2008	Tstm Wind	$	5,000
		2008 Subtotal	$	80,000
Good Hope	6/27/2009	Tstm Wind	$	50,000
Walnut Grove	6/27/2009	Tstm Wind	$	100,000
Bushnell	6/27/2009	Tstm Wind	$	25,000
Doddsville	8/4/2009	Tstm Wind	$	25,000
		2009 Subtotal	$	200,000
		Total Property Damage	**$**	**825,000**

The historical NCDC data can be sporadic in spatial and temporal coverage and not fully documented all damages related to severe thunderstorms or high winds. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based on averages in approximately the last decade, it can be determined that McDonough County incurs an annual property loss of approximately $82,500 per year.

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 McDonough County residents.

4.4.5 Drought and Extreme Heat Hazard

Hazard Definition for Drought Hazard

Drought is a climatic phenomenon that occurs in McDonough County. The meteorological condition that creates a drought is below normal rainfall. However, excessive heat can lead to increased evaporation, which will enhance drought conditions. Droughts can occur in any month. Drought differs from normal arid conditions found in low rainfall areas. Drought is the consequence of a reduction in the amount of precipitation over an undetermined length of time (usually a growing season or more).

The severity of a drought depends on location, duration, and geographical extent. Additionally, drought severity depends on the water supply, usage demands made by human activities, vegetation, and agricultural operations. Drought brings several different problems that must be addressed. The quality and quantity of crops, livestock, and other agricultural assets will be affected during a drought. Drought can adversely impact forested areas leading to an increased potential for extremely destructive forest and woodland fires that could threaten residential, commercial, and recreational structures.

Hazard Definition for Extreme Heat Hazard

Drought conditions are often accompanied by extreme heat, which is defined as temperatures that hover 10°F or more above the average high for the area and last for several weeks. Extreme heat can occur in humid conditions when high atmospheric pressure traps the damp air near the ground or in dry conditions, which often provoke dust storms.

Common Terms Associated with Extreme Heat

Heat Wave: Prolonged period of excessive heat, often combined with excessive humidity

Heat Index: A number in degrees Fahrenheit that tells how hot it feels when relative humidity is added to air temperature. Exposure to full sunshine can increase the heat index by 15°F.

Heat Cramps: Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are often the first signal that the body is having trouble with heat.

Heat Exhaustion: Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs, resulting in a form of mild shock. If left untreated, the victim's condition will worsen. Body temperature will continue to rise and the victim may suffer heat stroke.

Heat and Sun Stroke: A life-threatening condition. The victim's temperature control system, which produces sweat to cool the body, stops working. The body's temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

Source: FEMA

Previous Occurrences for Drought and Extreme Heat Hazard

The NCDC database reported three drought/heat wave events in McDonough County since 1959. The most recent reported event occurred in August 2000 across west-central Illinois. Temperatures topped out in the lower to middle 90s. Combined with high humidity, the hot temperatures resulted in heat indices ranging from 105 to 115 degrees during the afternoon of August 31, 2000.

NCDC records of droughts/heat waves are identified in Table 4-31. Pictures of some of the drought events are shown in Appendix D. Additional details of individual hazard events can be found on the NCDC website.

Table 4-31: McDonough County Drought/Heat Wave Events*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Statewide	7/25/1997	Excessive Heat	N/A	0	0	0	0
Statewide	7/19/1999	Excessive Heat	N/A	1	0	0	0
Central Illinois	8/31/2000	Excessive Heat	N/A	0	0	0	0

* 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 Drought and Extreme Heat Hazard

Droughts are regional in nature. All areas of the United States are vulnerable to the risk of drought and extreme heat.

Hazard Extent for Drought and Extreme Heat Hazard

Droughts and extreme heat can be widespread or localized events. The extent of the droughts varies both in terms of the extent of the heat and the range of precipitation.

Risk Identification for Drought/Extreme Heat Hazard

Based on historical information and input from the planning team, the occurrence of future drought and extreme heat is possible. According to the RPI, drought and extreme heat is ranked as the number seven hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	**1**	=	**2**

Vulnerability Analysis for Drought and Extreme Heat Hazard

Drought and extreme heat impacts are an equally distributed threat across the entire jurisdiction; therefore, the county is vulnerable to this hazard and can expect the same impacts within the

affected area. According to FEMA, approximately 175 Americans die each year from extreme heat. Young children, elderly, and infirmed populations have the greatest risk.

The entire population and all buildings have been identified as at risk. The building exposure for McDonough County, as determined from the building inventory is included in Table 4-10.

Critical Facilities

All critical facilities are vulnerable to drought. A critical facility will encounter many of the same impacts as any other building within the jurisdiction, which should involve only minor damage. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather. Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts similar to those discussed for critical facilities. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather.

Infrastructure

During a drought 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 a fire that could result from the hot, dry conditions. 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 heat wave. 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 Drought/Extreme Heat Hazard

Future development will remain vulnerable to these events. Typically, some urban and rural areas are more susceptible than others. For example, urban areas are subject to water shortages during periods of drought. Excessive demands of the populated area place a limit on water resources. In rural areas, crops and livestock may suffer from extended periods of heat and drought. Dry conditions can lead to the ignition of wildfires that could threaten residential, commercial, and recreational areas.

Analysis of Community Development Trends

Because droughts and extreme heat are regional in nature, future development will be impacted across the county. Although urban and rural areas are equally vulnerable to this hazard, those living in urban areas may have a greater risk from the effects of a prolonged heat wave. The atmospheric conditions that create extreme heat tend to trap pollutants in urban areas, adding contaminated air to the excessively hot temperatures and creating increased health problems.

Furthermore, asphalt and concrete store heat longer, gradually releasing it at night and producing high nighttime temperatures. This phenomenon is known as the "urban heat island effect."

Source: FEMA

Local officials should address drought and extreme heat hazards by educating the public on steps to take before and during the event—for example, temporary window reflectors to direct heat back outside, staying indoors as much as possible, and avoiding strenuous work during the warmest part of the day.

4.4.6 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: 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 central 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 2007–09, numerous ice storm events have occurred in central Illinois.

Snowstorms

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

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

Severe Cold

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

Previous Occurrences for Winter Storm Hazard

The NCDC database identified 76 winter storm and extreme cold events for McDonough County since 1995. These storm events have been attributed with one injury and $120,000 in property damage. The most recent reported event occurred in February 2009. Light to moderate snow, with brief heavy snow, fell across central Missouri and western Illinois. In addition to the accumulation of 3 to 5 inches of snow, strong northwest wind gusts reaching 35 to 40 mph produced areas of blowing and drifting.

The NCDC winter storms are listed in Table 4-32. Pictures of some of the winter storm events are shown in Appendix D. Additional details of individual hazard events can be found on the NCDC website.

Table 4-32: Winter Storm Events*

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
Central Illinois	1/18/1995	Heavy Snow	0	0	0	0
Central Illinois	11/10/1995	Snow/sleet/freezing Rain	0	0	0	0
Central Illinois	11/27/1995	Snow/sleet/freezing Rain	0	0	0	0
Central Illinois	1/18/1996	Winter Storm	0	0	0	0
Central Illinois	1/30/1996	Extreme Cold	0	0	0	0
Central Illinois	2/1/1996	Extreme Cold	0	0	0	0
Central Illinois	11/14/1996	Winter Storm	0	0	0	0
Central Illinois	12/27/1996	Winter Storm	0	0	0	0
Central Illinois	1/9/1997	Winter Storm	0	0	0	0
Central Illinois	1/10/1997	Extreme Wind-chill	0	1	0	0
Central Illinois	1/15/1997	Winter Storm	0	0	0	0
Central Illinois	1/17/1997	Extreme Wind-chill	0	0	0	0
Central Illinois	1/24/1997	Winter Storm	0	0	0	0
Central Illinois	2/3/1997	Winter Storm	0	0	0	0
Central Illinois	4/10/1997	Heavy Snow	0	0	0	0
Central Illinois	12/9/1997	Heavy Snow	0	0	0	0
Central Illinois	12/24/1997	Heavy Snow	0	0	0	0
Central Illinois	1/8/1998	Winter Storm	0	0	0	0
Central Illinois	3/8/1998	Heavy Snow	0	0	0	0
Central Illinois	12/30/1998	Winter Storm	0	0	0	0
Central Illinois	1/1/1999	Winter Storm	0	0	0	0
Central Illinois	3/5/1999	Winter Storm	0	0	0	0
Central Illinois	3/8/1999	Winter Storm	0	0	0	0
McDonough County	12/15/1999	Winter Storm	0	0	0	0
Central Illinois	12/16/1999	Winter Storm	0	0	0	0
Central Illinois	12/19/1999	Winter Storm	0	0	0	0
Central Illinois	12/23/1999	Winter Storm	0	0	0	0
Central Illinois	1/3/2000	Winter Storm	0	0	0	0
Central Illinois	1/17/2000	Winter Storm	0	0	0	0
Central Illinois	1/29/2000	Winter Storm	0	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
Central Illinois	2/17/2000	Winter Storm	0	0	0	0
Central Illinois	12/1/2000	Record Cold	0	0	0	0
Central Illinois	12/1/2000	Record Snow	0	0	0	0
Central Illinois	12/1/2000	Snow	0	0	0	0
Central Illinois	12/10/2000	Winter Storm	0	0	0	0
Central Illinois	12/13/2000	Snow	0	0	0	0
Central Illinois	12/15/2000	Ice Storm	0	0	0	0
Central Illinois	12/16/2000	Extreme Wind-chill	0	0	0	0
Central Illinois	12/18/2000	Snow/blowing Snow	0	0	0	0
Central Illinois	12/20/2000	Snow	0	0	0	0
Central Illinois	12/21/2000	Extreme Wind-chill	0	0	0	0
Central Illinois	12/23/2000	Extreme Wind-chill	0	0	0	0
Central Illinois	12/28/2000	Snow	0	0	0	0
Central Illinois	1/26/2001	Snow/blowing Snow	0	0	0	0
Central Illinois	1/28/2001	Ice Storm	0	0	0	0
Central Illinois	2/8/2001	Winter Storm	0	0	0	0
Central Illinois	1/30/2002	Winter Storm	0	0	0	0
Central Illinois	3/1/2002	Winter Storm	0	0	0	0
McDonough County	1/2/2003	Winter Storm	0	0	0	0
McDonough County	1/15/2003	Winter Storm	0	0	0	0
Central Illinois	2/14/2003	Winter Storm	0	0	0	0
Central Illinois	11/24/2004	Heavy Snow	0	0	15K	0
Central Illinois	1/5/2005	Ice Storm	0	0	80K	0
Central Illinois	12/8/2005	Winter Weather/mix	0	0	0	0
Central Illinois	1/20/2006	Ice Storm	0	0	15K	0
Central Illinois	3/21/2006	Winter Weather	0	0	10K	0
McDonough County	11/30/2006	Winter Storm	0	0	0	0
McDonough County	1/12/2007	Ice Storm	0	0	0	0
Central Illinois	1/20/2007	Winter Weather	0	0	0	0
McDonough County	2/6/2007	Winter Weather	0	0	0	0
McDonough County	2/12/2007	Winter Storm	0	0	0	0
McDonough County	2/16/2007	Winter Weather	0	0	0	0
McDonough County	2/24/2007	Ice Storm	0	0	0	0
McDonough County	12/1/2007	Ice Storm	0	0	0	0
Central Illinois	12/6/2007	Winter Weather	0	0	0	0
McDonough County	12/10/2007	Ice Storm	0	0	0	0
Central Illinois	12/15/2007	Winter Weather	0	0	0	0
McDonough County	12/22/2007	Winter Weather	0	0	0	0
Central Illinois	12/31/2007	Winter Weather	0	0	0	0
Central Illinois	1/29/2008	Winter Weather	0	0	0	0
McDonough County	1/31/2008	Winter Weather	0	0	0	0
McDonough County	2/3/2008	Winter Weather	0	0	0	0
McDonough County	2/6/2008	Winter Weather	0	0	0	0
McDonough County	2/28/2008	Winter Weather	0	0	0	0
Central Illinois	11/30/2008	Winter Weather	0	0	0	0
Central Illinois	12/16/2008	Winter Weather	0	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
McDonough County	12/18/2008	Ice Storm	0	0	0	0
McDonough County	2/21/2009	Winter Weather	0	0	0	0

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

Risk Identification for Winter Storm Hazard

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

RPI = Probability x Magnitude/Severity.

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

Vulnerability Analysis for Winter Storm Hazard

Winter storm impacts are equally distributed across the entire jurisdiction; therefore, the entire county is vulnerable to a winter storm and can expect the same impacts within the affected area. The building exposure for McDonough County, as determined from the building inventory, is included in Table 4-10.

Critical Facilities

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

Building Inventory

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

Infrastructure

During a winter storm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is 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.

Potential Dollar Losses for Winter Storm Hazard

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

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

It was determined that since 1999, McDonough County has incurred $120,000 in property damages relating to winter storms, including sleet/ice and heavy snow. The historical data is erratic and not wholly documented or confirmed. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based on averages in the last decade, it can be determined that McDonough County incurs an annual risk of approximately $12,000 per year.

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 equally impacted across the county.

4.4.7 Hazardous Materials Storage and Transport Hazard

Hazard Definition for Hazardous Materials Storage and Transport Hazard

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

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

Previous Occurrences for Hazardous Materials Storage and Transport Hazard

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

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, railroad, and/or river barge.

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.

Risk Identification for Hazardous Materials Release

Based on input from the planning team, the occurrence of a hazardous materials accident is likely. According to the RPI, Hazardous Materials Storage and Transport ranked as the number four hazard.

RPI = Probability x Magnitude/Severity.

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

Vulnerability Analysis for Hazardous Materials Storage and Transport Hazard

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

Critical Facilities

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

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can 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 residents to seek shelter).

Infrastructure

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

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

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for Anhydrous Ammonia release during a transportation incident at the intersection of US 136 (Jackson Street) and the Burlington Northern and Santa Fe Railroad Line in Macomb.

Anhydrous ammonia is a clear colorless gas with a strong odor. Contact with the unconfined liquid can cause frostbite. Though the gas is generally regarded as nonflammable, it can burn within certain vapor concentration limits with strong ignition. The fire hazard increases in the presence of oil or other combustible materials. Vapors from an anhydrous ammonia leak initially

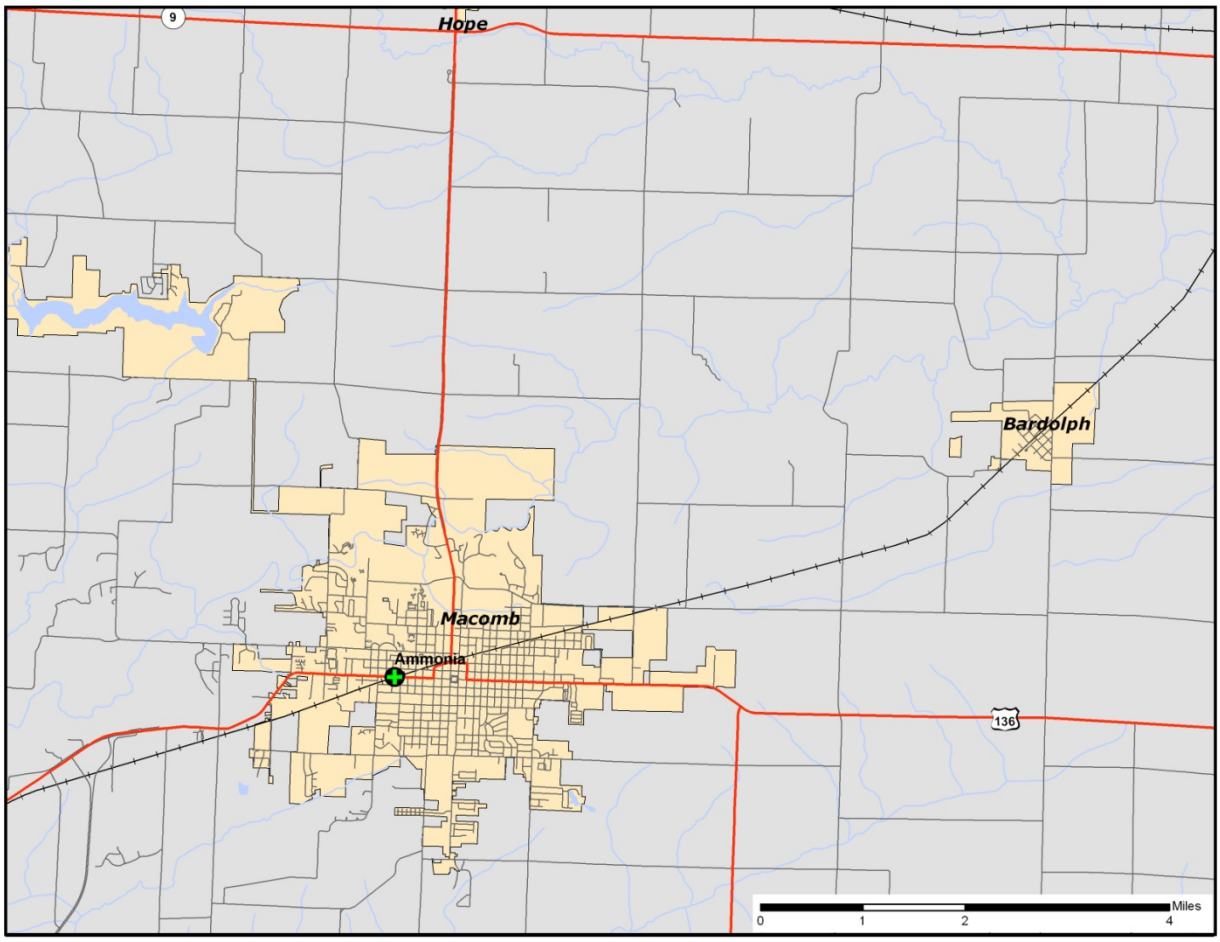
hug the ground, and prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations has adverse health effects. Anhydrous ammonia is generally used as a fertilizer, a refrigerant, and in the manufacture of other chemicals.

Source: CAMEO

ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Anhydrous ammonia is a common chemical used in industrial and agricultural operations and can be found in either liquid or gas form. Rail and truck tankers commonly haul anhydrous ammonia to and from facilities.

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area was chosen due to its proximity to the residential, commercial, and essential facility locations. The geographic area covered in this analysis is depicted in Figure 4-12.

Figure 4-12: Location of Chemical Release



Analysis

The ALOHA atmospheric modeling parameters, depicted in Figure 4-13, were based upon a westerly wind speed of five miles per hour. The temperature was 70°F with 75% humidity and a cloud cover of five-tenths skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 100% full. The anhydrous ammonia in this tank is in its liquid state.

This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to the ALOHA parameters, approximately 7,890 pounds of material would be released per minute. The image in Figure 4-14 depicts the plume footprint generated by ALOHA.

Figure 4-13: ALOHA Plume Modeling Parameters

SITE DATA:
Location: MACOMB, ILLINOIS
Building Air Exchanges per Hour: 0.32 (sheltered single storied)
Time: May 8, 2010 1105 hours CDT (using computer's clock)

CHEMICAL DATA:
Chemical Name: AMMONIA Molecular Weight: 17.03 g/mol
AEGL-1(60 min): 30 ppm AEGL-2(60 min): 160 ppm AEGL-3(60 min): 1100 ppm
IDLH: 300 ppm LEL: 160000 ppm UEL: 250000 ppm
Ambient Boiling Point: -29.0° F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

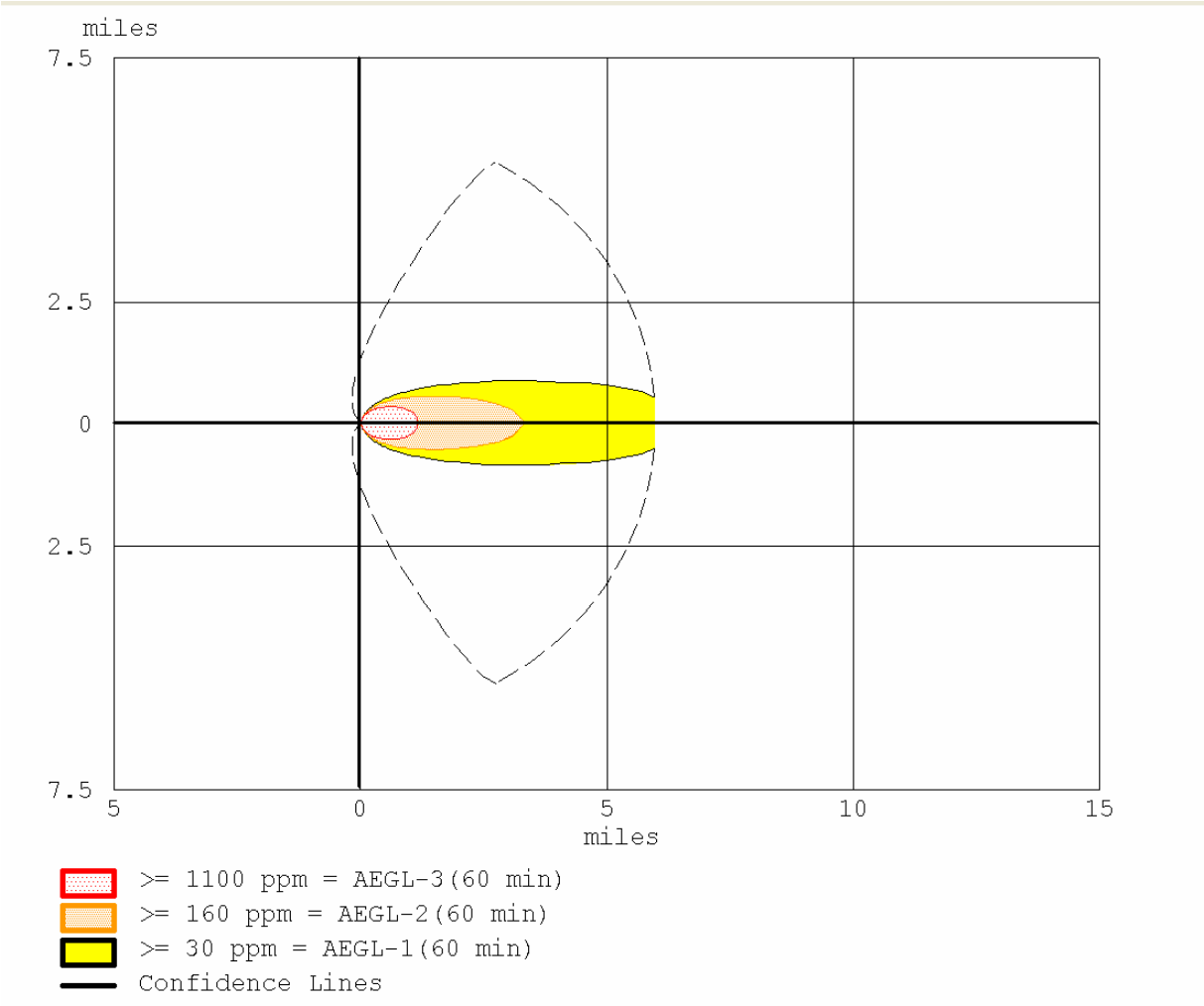
ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 5 miles/hour from SW at 10 meters
Ground Roughness: open country Cloud Cover: 5 tenths
Air Temperature: 70° F Stability Class: B
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 8 feet Tank Length: 33 feet
Tank Volume: 12,408 gallons
Tank contains liquid Internal Temperature: 70° F
Chemical Mass in Tank: 31.5 tons Tank is 100% full
Circular Opening Diameter: 2.5 inches
Opening is 12 inches from tank bottom
Release Duration: 14 minutes
Max Average Sustained Release Rate: 7,890 pounds/min
(averaged over a minute or more)

Total Amount Released: 60,060 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.2 miles --- (1100 ppm = AEGL-3(60 min))
Orange: 3.3 miles --- (160 ppm = AEGL-2(60 min))
Yellow: greater than 6 miles --- (30 ppm = AEGL-1(60 min))

Figure 4-14: Plume Footprint Generated by ALOHA



Acute Exposure Guideline Levels (AEGLs) are intended to describe the health effects on humans due to once-in-a-lifetime or rare exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). The image in Figure 4-15 depicts the plume footprint generated by ALOHA in ArcGIS.

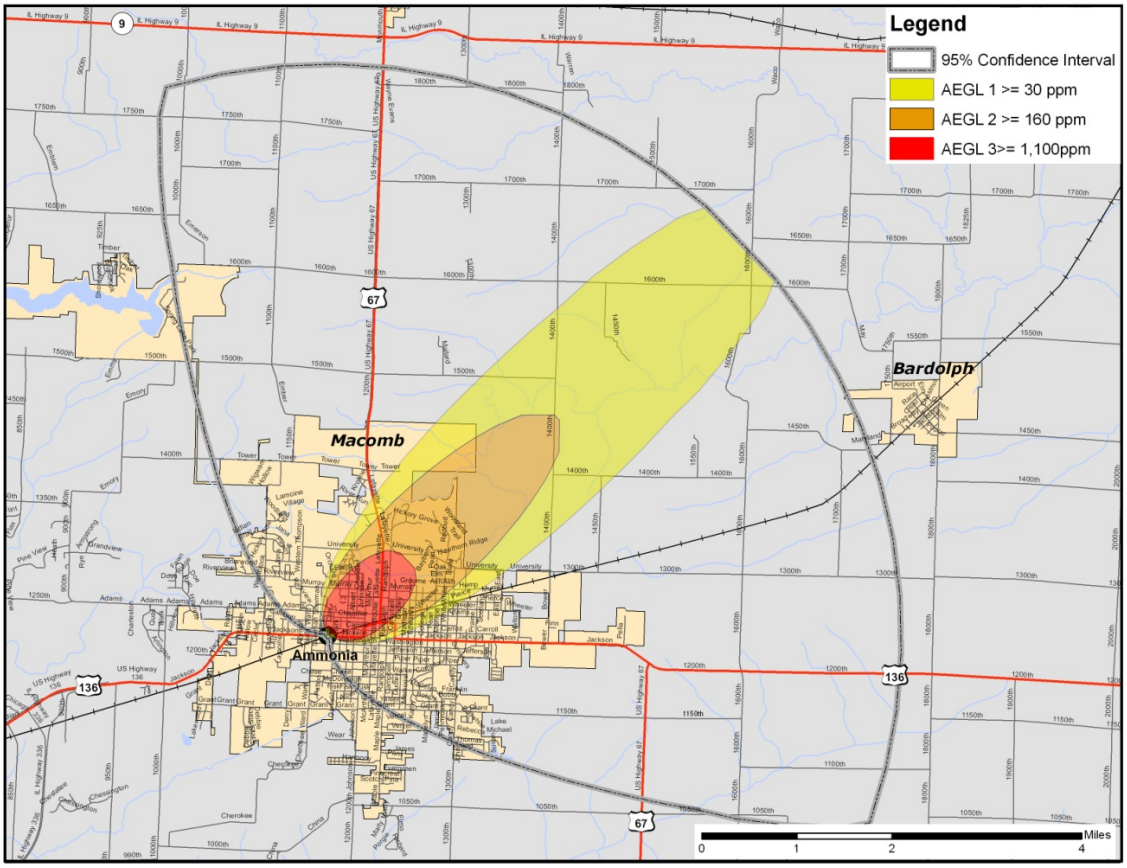
- **AEGL 3:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death. The red buffer (≥1100 ppm) extends no more than two miles from the point of release after one hour.

- **AEGL 2:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape. The orange buffer (≥160 ppm) extends no more than four miles from the point of release after one hour.

- **AEGL 1:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. The yellow buffer ≥30 ppm) extends more than six miles from the point of release after one hour.

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

Figure 4-15: ALOHA Plume Footprint Overlaid in ArcGIS

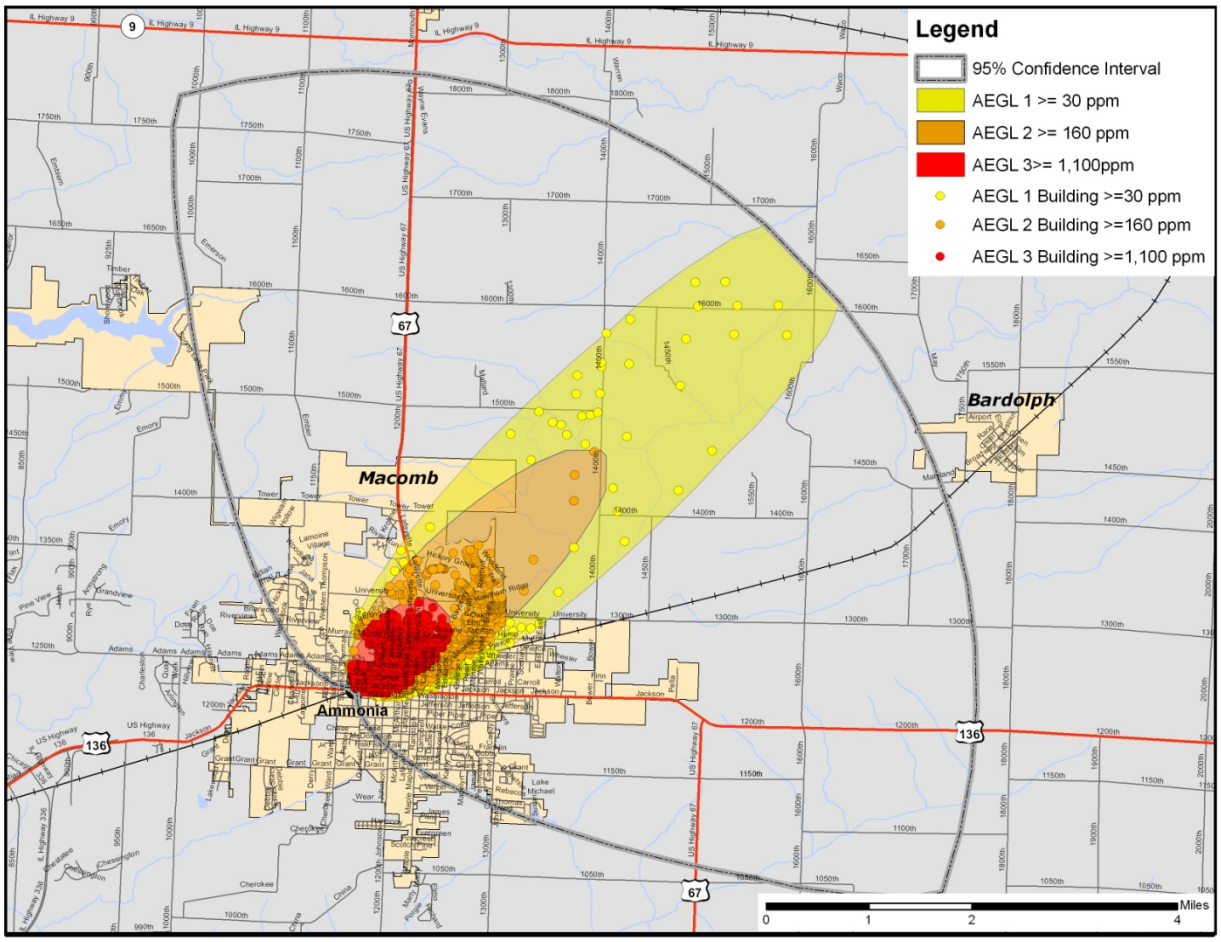


Results

By summing the building inventory within all AEGL levels (AEGL 3: ≥1,100 ppm, AEGL 2: ≥160 ppm and Level 1: ≥30 ppm.), the GIS overlay analysis predicts that as many as 1,638 buildings could be exposed at a replacement cost of $342.2 million. If this event were to occur, approximately 6,000 people would be affected. The results are depicted in Figure 4-16.

The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

Figure 4-16: McDonough County Building Inventory Classified By Plume Footprint



Building Inventory Damage

The results of the analysis against the building inventory points are depicted in Tables 4-33 through 4-36. Table 4-33 summarizes the results of the chemical spill by combining all AEGL level. Tables 4-34 through 4-36 summarize the results of the chemical spill for each level separately.

Table 4-33: Estimated Exposure for all Level (all ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	3,315	1,326	$141,486,990
Commercial	0	181	$41,809,668
Industrial	0	10	$2,879,664
Agriculture	0	0	$0
Religious/Nonprofit	0	100	$0
Government	0	8	$0
Education	2,667	13	$156,000,000
Total	**5,982**	**1,638**	**$342,176,322**

Table 4-34: Estimated Exposure for Level 3 (>=1100 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	1,745	698	$68,383,702
Commercial	0	71	$16,682,586
Industrial	0	4	$503,498
Agriculture	0	0	$0
Religious/Nonprofit	0	27	$0
Government	0	1	$0
Education	867	6	$74,000,000
Total	**2,612**	**807**	**$159,569,786**

Table 4-35: Estimated Exposure for Level 2 (>=160 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	1,133	453	$58,899,218
Commercial	0	76	$15,507,036
Industrial	0	2	$194,438
Agriculture	0	0	$0
Religious/Nonprofit	0	47	$0
Government	0	2	$0
Education	1,800	3	$82,000,000
Total	**2,933**	**583**	**$156,600,692**

Table 4-36: Estimated Exposure for Level 1 (>=30 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	438	175	$14,204,070
Commercial	0	34	$9,620,046
Industrial	0	4	$2,181,728
Agriculture	0	0	$0
Religious/Nonprofit	0	26	$0
Government	0	4	$0
Education	0	0	$0
Total	**438**	**243**	**$26,005,844**

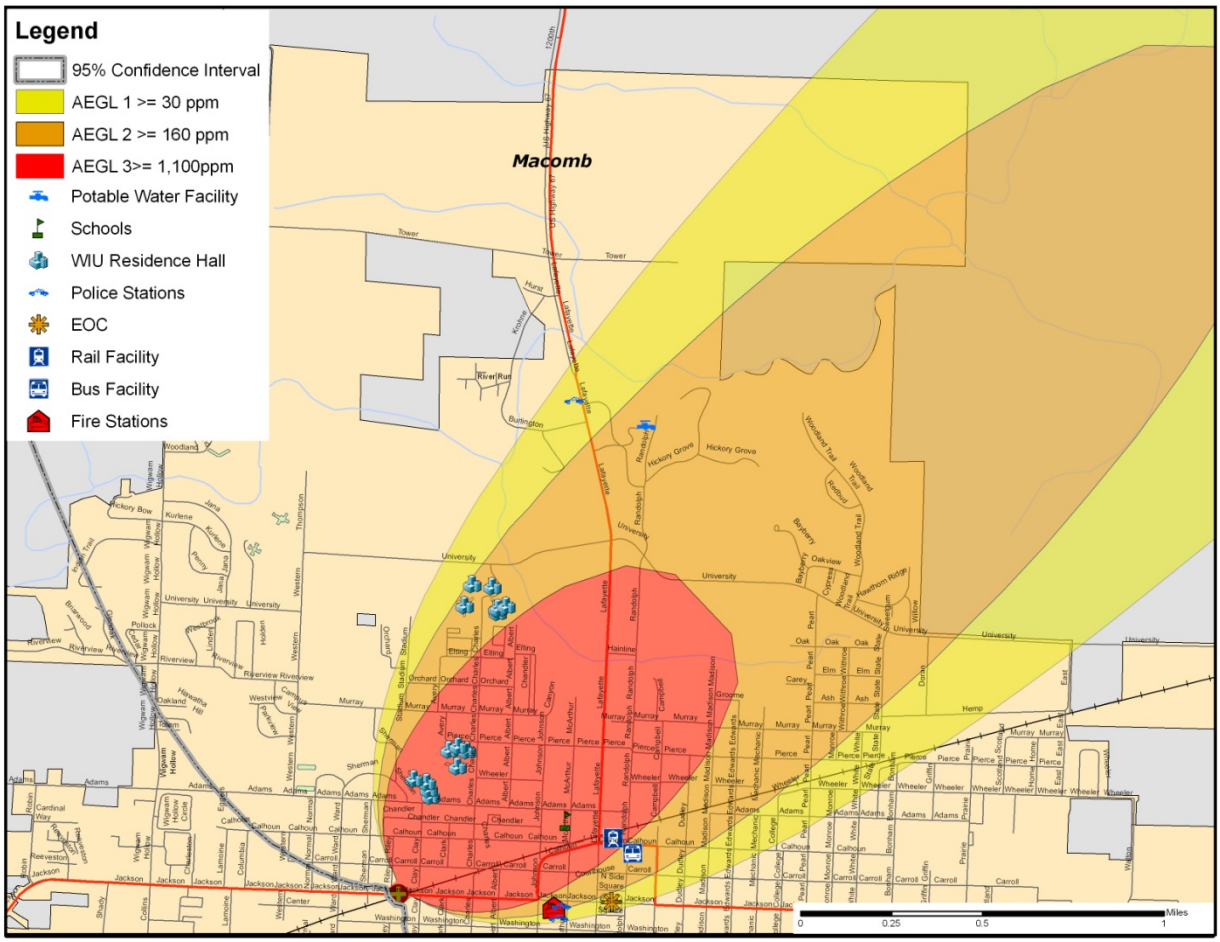
Critical Facilities Damage

There are 21 critical and user defined facilities within the limits of the chemical spill plume. The affected facilities are identified in Table 4-37. Their geographic locations are depicted in Figure 4-17.

Table 4-37: Essential Facilities within Plume Footprint

Name
Western Illinois University Dorms
Lincoln Hall
Washington Hall
Caroline Grote Hall
East Village
University Village B
University Village A
University Village C
Wetzel Hall
Tanner Hall
Bayliss Hall
Henninger Hall
Police Departments
Macomb Police Department
Mc Donough County Sheriff
Illinois State Police District 14 HQ
Fire Departments
Macomb Fire Dept
Emergency Operations Centers
McDonough Civil Defense (ESDA)
Schools
Project Insight
Utilities
Macomb Water Treatment Plant
Transportation
McDonough County Public Transit
Macomb Travel Center

Figure 4-17: Essential Facilities within Plume Footprint



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

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

Analysis of Community Development Trends

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

4.4.8 Fire Hazard

Hazard Definition for Fire Hazard

This plan will address three major categories of fires for McDonough County: 1) tire/scrap fires; 2) structural fires; and 3) wildfires.

Tire Fires

The state of Illinois generates thousands of scrap tires annually. Many of those scrap tires end up in approved storage sites that are carefully regulated and controlled by federal and state officials. However, scrap tires are sometimes intentionally dumped in unapproved locations throughout the state. The number of unapproved locations cannot be readily determined. These illegal sites are owned by private residents who have been continually dumping waste and refuse, including scrap tires, at those locations for many years.

Tire disposal sites can be fire hazards, in large part, because of the enormous number of scrap tires typically present at one site. This large amount of fuel renders standard firefighting practices nearly useless. Flowing and burning oil released by the scrap tires can spread the fire to adjacent areas. Tire fires differ from conventional fires in the following ways:

- Relatively small tire fires can require significant fire resources to control and extinguish.
- Those resources often cost much more than McDonough County government can absorb compared to standard fire responses.
- There may be significant environmental consequences of a major tire fire. Extreme heat can convert a standard vehicle tire into approximately two gallons of oily residue that may leak into the soil or migrate to streams and waterways.

Structural Fires

Lightning strikes, poor building construction, and building condition are the main causes for most structural fires in Illinois. McDonough County has a few structural fires each year countywide.

Wildfires

When hot and dry conditions develop, forests may become vulnerable to devastating wildfires. In the past few decades an increased commercial and residential development near forested areas has dramatically changed the nature and scope of the wildfire hazard. In addition, the increase in structures resulting from new development strains the effectiveness of the fire service personnel in the county.

Previous Occurrences for Fire Hazard

McDonough County has not experienced a significant or large-scale explosion at a fixed site or transportation route that has resulted in multiple deaths or serious injuries.

Geographic Location for Fire Hazard

Fire hazards occur countywide and therefore affect the entire county. The forested areas in the county have a higher chance of widespread fire hazard.

Hazard Extent for Fire Hazard

The extent of the fire hazard varies both in terms of the severity of the fire and the type of material being ignited. All communities in McDonough County are affected by fire equally.

Risk Identification for Fire Hazard

Based on input from the planning team, the occurrence of a fire is likely. According to the RPI, fire/explosion is ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	4	=	12

Vulnerability Analysis for Fire Hazard

This hazard impacts the entire jurisdiction equally; therefore, the entire population and all buildings within the county are vulnerable to fires and can expect the same impacts within the affected area.

Table 4-9 lists the types and numbers of all essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

The building exposure for McDonough County, as determined from the building inventory, is included in Table 4-10. Because of the difficulty predicting which communities are at risk, the entire population and all buildings have been identified at risk.

Critical Facilities

All critical facilities are vulnerable to fire hazards. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural damage from fire and water damage from efforts extinguishing fire. Table 4-9 lists the types and numbers of essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-10. Impacts to the general buildings within the county are similar to the

damages expected to the critical facilities. These impacts include structural damage from fire and water damage from efforts to extinguish the fire.

Infrastructure

During a fire 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 fire. Potential impacts include structural damage resulting in impassable roadways and power outages.

Vulnerability to Future Assets/Infrastructure for Fire Hazard

Any future development will be vulnerable to these events.

Analysis of Community Development Trends

Fire hazard events may occur anywhere within the county, because of this future development will be impacted.

4.4.9 Ground Failure Hazard

Subsidence

Subsidence in Illinois is a sinking of the land surface, usually associated with either underground mining or collapse of soil into crevices 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 McDonough County. This section provides an overview of the subsidence hazards in Illinois in general and a discussion of the potential subsidence risk for McDonough County.

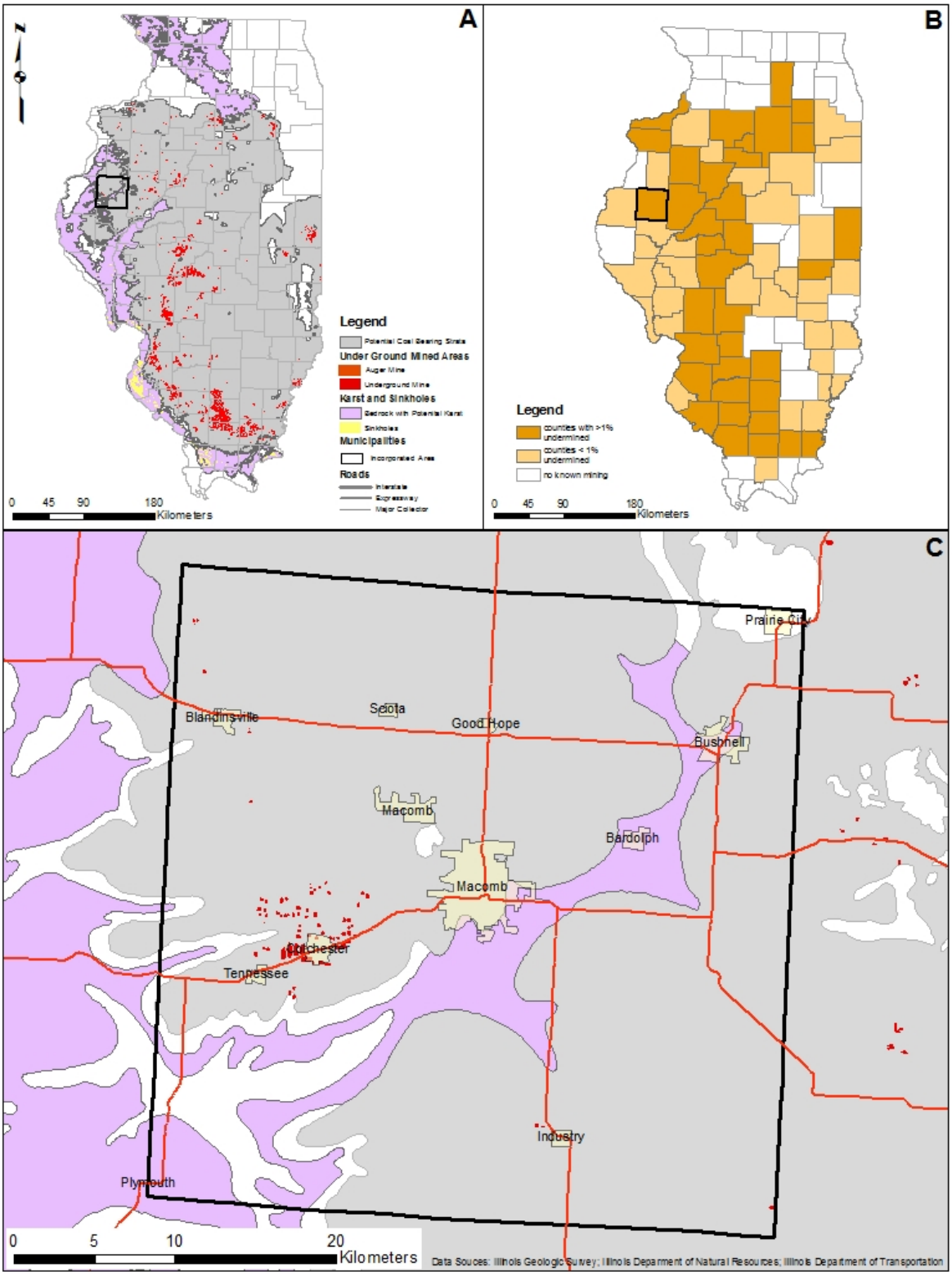
Underground Mining and Subsidence

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 approximately 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, approximately 1,050,400 acres (2.8% of the state) were 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 4-26a shows the statewide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines. Figure 4-26b shows the counties which are 0, < 1%, and >1% undermined; Figure 4-26c shows the countywide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines.

Figures 4-26a, 4-26b, and 4-26c: 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 is 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 overburden 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 as 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 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 materials are unconsolidated (loose), these materials 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 of a building, under a support post of a foundation, or in another critical location. Subsidence pits should be filled to ensure that people or animals do not fall into these structures (Bauer, 2006).

Trough 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 previously discussed, 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, within a few hours or days, or gradually over a period of years. Troughs originate over places in mines where pillars have collapsed, producing downward movement at the ground surface. These failures can develop

over mines of any depth. Trough subsidence produces 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 relates 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 may buckle and foundation walls may be pushed inward. Buildings damaged by compressional forces typically need their foundations rebuilt and may also need to be leveled due to differential settling (Bauer, 2006).

Mine Subsidence Insurance

The Mine Subsidence Insurance, as 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 McDonough County

Nearly all of McDonough County is underlain by rock units which potentially 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 6.3 mi^2 out of McDonough County's total 591 mi^2 (~ 1%) have been undermined. Nearly all the undermined areas are located near Colchester in the west central portion of the County. Towns potentially impact by mine subsidence include Colchester and Tennessee. Comparison of the GIS layer of parcels with structures attained from McDonough County with IDNR GIS layer of active and abandoned underground-coal mines was performed. This analysis revealed that 70 out of the 14,400 or <1% of the buildings in the county were above undermined areas. The 70 structures located above underground mines have an estimate value of $340,000.

Subsidence Related to Karst Features

Subsidence can also occur on land located over soluble bedrock. The land over such bedrock often has topography characteristics of past subsidence events. This topography is termed "karst." Karst terrain has unique landforms and hydrology found only in these areas. Bedrock in 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).

Sinkhole Formation

The karst feature most associated with subsidence is the sinkhole. A sinkhole is an area of ground with 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 it.

Sinkhole Collapse

Sudden collapse of a sinkhole occurs when 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 continues to wash 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 McDonough County

McDonough County is not underlain by a significant expanse of near-surface soluble bedrock (Figure 4-26c). Subsidence related to bedrock dissolution and their related soil piping features should not be an issue in McDonough County.

Hazard Extent for Subsidence

The extent of subsidence hazard in McDonough County is a function of where current development is located relative to areas of past and present underground mining and the occurrence of near-surface soluble bedrock.

Calculated Risk Priority Index for Ground Failure

Based on historical information, future ground failure in the affected regions of McDonough County is possible. While the planning team did not select ground failure as a potential significant hazard facing the County, several incorporated communities selected ground failure as a potential hazard (Table 4-6)

Vulnerability Analysis for Ground Failure

The existing buildings and infrastructure of McDonough County are discussed in types and numbers in Table 4-10

Critical Facilities

Any critical facility built above highly soluble bedrock or an underground mine 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 4-9 lists 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 4-10 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 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

Ground subsidence areas within McDonough County could impact the 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 (e.g. 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, McDonough 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 the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. The goal of mitigation is to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment, provided in Section 4 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community's needs.

5.1 Community Capability Assessment

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

5.1.1 National Flood Insurance Program (NFIP)

McDonough County, the City of Bushnell, and City of Macomb are members of the NFIP. The villages of Good Hope, Prairie City, Sciota, Bardolph, Blandinsville, Industry, Tennessee and the City of Colchester do not have an identified flood hazard boundary, and therefore choose not to participate in the program.

HAZUS-MH identified approximately 160 households located within the McDonough County Special Flood Hazard Area; 2 households paid flood insurance, insuring $70,000 in property value. The total premiums collected amounted to $619, which on average was $21 annually. From 1978 through 2007, only one claim has been filed totaling $2,298.

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

Table 5-1 identifies each community and the date each participant joined the NFIP.

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

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Floodplain Ordinance
McDonough County	6/17/1997	1/2/1981	N/A	N/A	6/17/1997
Village of Bardolph	N/A	N/A	N/A	N/A	N/A
Village of Blandinsville	N/A	N/A	N/A	N/A	N/A
City of Bushnell	6/7/1975	8/20/1976	N/A	N/A	8/20/1976
City of Colchester	N/A	N/A	N/A	N/A	N/A
Village of Good Hope	N/A	N/A	N/A	N/A	N/A
Village of Industry	N/A	N/A	N/A	N/A	N/A
City of Macomb	2/11/2009	NSFHA	N/A	N/A	2/11/2009
Village of Prairie City	N/A	N/A	N/A	N/A	N/A
Village of Sciota	N/A	N/A	N/A	N/A	N/A
Village of Tennessee	N/A	N/A	N/A	N/A	N/A

5.1.2 Stormwater Management Stream Maintenance Ordinance

McDonough County does not have a Stormwater Management Ordinance. However, The City of Macomb addresses stormwater management within the planning ordinances. The planning ordinances contain regulations on creation of stormwater sewers, parking lots, and development of impervious surfaces to manage stormwater.

5.1.3 Zoning Management Ordinance

The majority of McDonough County does not have zoning regulations. The City of Macomb has enacted a series of ordinances since 1972. Table 5-2 lists the adoption dates of plans and ordinances for The City of Macomb. Ordinances for The City of Macomb are documented in the "Municipal Code of Macomb, Illinois" which was released in December of 2008. This document lists details about each of the ordinances listed below as well as several other ordinances.

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
McDonough County	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Bardolph	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Blandinsville	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Bushnell	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Colchester	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Good Hope	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Industry	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Macomb	1997	1972	2000	1997	1997	1972	N/A	Intl.
Village of Prairie City	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Sciota	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Tennessee	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.1.4 Erosion Management Program/ Policy

McDonough County does not have an erosion management program. The City of Macomb has erosion management policy within the division of planned unit development. The City requires that any possible project designs contain a plan to control sedimentation and erosion within the given desired project site.

5.1.5 Fire Insurance Rating Programs/ Policy

Table 5-3 lists McDonough County's fire departments and respective information.

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

Fire Department	Fire Insurance Rating	Number of Firefighters
Blandinsville-Hire Fire Department	9	20
Bushnell Fire Protection District	9	27
Colchester Fire Protection District	9	22
Emmet-Chalmers Fire Protection District	9	15
Good Hope - Sciota Fire Protection District	9	24
Industry Fire Protection District	7	15
Macomb Fire Dept	4	20
New Salem Fire Protection District	9	28

5.1.6 Land Use Plan

McDonough County does not have a land use plan; the City of Macomb addresses land use within its zoning ordinance.

5.1.7 Building Codes

McDonough County uses the International Building Code as their guide for public building standards. The City of Macomb has adopted the International Building Code in their 2009 Municipal Code.

5.2 Mitigation goals

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

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

(a) Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.

(b) Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.

(c) Objective: Minimize the amount of infrastructure exposed to hazards.

(d) Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.

(e) Objective: Improve emergency sheltering in McDonough County.

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

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

(b) Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.

(c) Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.

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

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

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

5.3 Mitigation Actions/Projects

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

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held May 18, 2010, 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 June 14, 2010. 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?

5.3.1 Completed or Current Mitigation Actions/Projects

Since this is the first mitigation plan developed for McDonough 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.

5.4 Implementation Strategy and Analysis of Mitigation Projects

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

In Meeting #4, the planning team prioritized mitigation actions based on a number of factors. A rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 5-5. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 5-6.

Table 5-4: Completed and Ongoing Mitigation Actions

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Complete a siren placement study to determine siren coverage	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	Bushnell, Macomb	Complete	This study is complete.
Establish tie-down ordinances for mobile home parks	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Thunderstorm	Bushnell, Macomb	Complete	This mitigation action is complete.
Develop mutual aid agreements, i.e., Illinois Law Enforcement Alarm System (ILEAS) and Mutual Aid Box Alarm System (MABAS)	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County	Complete	These agreements are in place.
Establish a mass notification system	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	Macomb	Complete	Western Illinois University and Macomb schools utilize a mass notification system. The county has a separate strategy for equipping other communities with a similar system.
Procure permanent signage for frequently flooded roads	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.	Flood	McDonough County	Complete	Unincorporated areas of the county have permanent warning signs.
Establish Storm Ready Communities	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Tornado, Flood, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Ongoing	Incorporated and unincorporated communities in the county are Storm Ready designated.

Table 5-5: Future Mitigation Actions

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct a new flood study (DFIRM)	Goal: Create new or revise existing plans/maps for the community Objective: Support compliance with the NFIP for each jurisdiction.	Flood	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High	The County ESDA Director will oversee this project. FEMA will be approached for funding and assistance with the study. If funding is available, implementation will begin within one year.
Increase water storage capacity by dredging lakes	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve flood water retention and water storage	Flood, Drought	Macomb	High	The County ESDA Director will work with IDNR to oversee implementation of this project. Local resources and DNR are proposed sources of funding. Implementation will begin within one year.
Develop or adapt guidelines or regulations which require higher building and safety standards for new public and governmental buildings to increase disaster resistance throughout the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High	The ESDA Director will oversee this project. Funding sources will include local, state, and federal agencies and grant opportunities. Implementation will begin within one year.
Institute a mass notification system, e.g. Reverse 911. Nixel or Blackboard Connect, to cover all communities within the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve communication and relating to hazards with residence of McDonough County	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire	McDonough County	High	The County ESDA Director oversees the implementation of the project. Macomb is the only community with a mass notification system. Local resources will be used to maintain the system. Funding for implementation will be sought from state and federal agencies. Implementation, if funding is available, is forecasted to begin within one year.
Develop hazard mitigation and response protocols in businesses and schools; ensure that residents are aware of the protocols	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High	County officials will work with contacts in major businesses and schools to develop appropriate protocols. FEMA and IEMA will be approached for funding of materials and public education literature. If funding is available, implementation will begin within one year.
Procure generators or transfer situations for all essential facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the community.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Fire	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High	The County ESDA Director will oversee the implementation of this project. Local resources will be used to determine which facilities should receive generators. Funding has not been secured as of 2010, but local resources, community grants, or the PDM program are possible funding sources. If funding is available, this project is forecasted to begin within one year.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Educate the public on the benefits of the NFIP	Goal: Create new or revise existing plans/maps for the community Objective: Support compliance with the NFIP for each jurisdiction.	Flood	Bardolph, Blandinsville, Colchester, Good Hope, Industry, Plymouth, Prairie City, Sciota, Tennessee	Medium	Although the county is not typically at risk of severe flooding, the County Floodplain Manager will establish a team to educate the public on the benefits of joining the NFIP. FEMA may be approached for funding for educational materials. If funding and resources are available, implementation will begin within three years.
Repair drainage tiles and culverts at Barns and Jackson, 600 block of W. Davis, Harrison and W. Main, Time and Cleveland, and Jackson and Ward	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to flash floods.	Flood	Bushnell, Macomb	Medium	The Cities of Bushnell and Macomb will coordinate this project. Funding will be sought from IDNR and IEMA. If funding is available, implementation will begin within three years.
Establish a first response hazmat team, conduct appropriate training, and procure equipment	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat	McDonough County	Medium	Currently the county relies on mutual aid for much of its hazmat response. The ESDA Director will work with local first responders to develop a team. The county will request funding for training and equipment from IEMA and community grants. If funding is available, implementation will begin within three years.
Conduct a commodity flow study	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	McDonough County, Bushnell, Colchester, Macomb	Medium	The County ESDA Director and first responders will oversee implementation of this project. Community planners and local government leaders will coordinate this study. Funding will be requested from community grants or IEMA. Implementation will begin within three years.
Conduct a study to potentially re-engineer intersections with frequent vehicle accidents and complete pre-staged evacuation exercises	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat, Fire	McDonough County, Bushnell, Colchester, Macomb	Medium	The ESDA Director will work with the County and State Highway Departments to implement this project. Funding for engineers will be sought from state agencies and community grants. Implementation will begin within three years.
Conduct a study to determine shelter capacity in the county	Goal: To determine counties capacity to provide shelter and basic services to residence during a disaster. Objective: Improve emergency sheltering in the community.	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	The ESDA Director will work with local shelters to complete this project and will perhaps use HAZUS-MH. If additional shelters or supplies are needed, the PDM program or local resources are funding options. If funding is available, implementation will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Develop a database of special needs populations to be housed at a facility that can serve as a shelter	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	The health department will be approached to oversee implementation of this project. Local resources will be used to update the database. Once the database is in place, County planners and first response agencies can develop specialized evacuation plans. Implementation will begin within three years.
Purchase new equipment for managing debris, e.g. chippers and stump grinders	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	The County needs additional funding for debris management. The County ESDA Director will work with other local government leaders and first responders to determine what is needed. Funding may be sought from IDOT, IEMA, or community grants. If funding is available, implementation will begin within three years.
Harden fire and police stations; electric, water, and sewer plants, government buildings, and older university buildings	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	The County Engineer will oversee this project. Local resources will be used to determine which buildings should be hardened. Additional funding will be sought for an engineered study. Funding has not been secured as of 2010, but the PDM program or community grants are an option. If funding is available, implementation will begin within three years.
Establish shelters in mobile home parks and recreational parks and safe rooms in certain residential and commercial buildings	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the community.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	The County ESDA Director will oversee this project. A shelter study will be used to identify shelter areas. Funding has not been secured as of 2010, but the PDM program and community development grants are possible sources. Implementation will begin within three years.
Construct warming centers in each community within the county	Goal: Lessen the impacts of cold water hazards to the residence of McDonough County Objective: Improve emergency sheltering in the community.	Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium	Currently, only Western Illinois University has a warming center. The ESDA Director will work with local shelters and Red Cross to complete this project. The PDM program or local resources are funding options. If funding is available, implementation will begin within three years.
Purchase snow removal equipment and de-icing agents	Goal: Lessen the impacts of winter storms on transportation and emergency response. Objective: Equip public facilities and communities with adequately handle heavy snow and ice.	Winter Storm	McDonough County, Bardolph, Blandinsville, Colchester, Good Hope, Industry, Plymouth, Prairie City, Sciota, Tennessee	Medium	The County needs additional funding for equipment and salt. The County Engineer will work with other local government leaders and first responders to determine what is needed. Funding may be sought from ILDOT or IEMA. If funding is available, implementation will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Install inertial valves at critical facilities	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.	Earthquake	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low	The County ESDA Director will oversee implementation of this project and determine which facilities do not currently have inertial valves. Funding has not been secured as of 2010, but the PDM program and community grants are an option. If funding is available, implementation will begin within five years.
Establish a watershed tax to improve storm drainage	Goal: Create new or revise existing plans/maps for the community Objective: Improve infrastructure to reduce future flood damage.	Flood	Macomb	Low	The City of Macomb will work with the local planning commission to pursue a watershed tax. If local, state, and federal resources are available, implementation of this project will begin within five years.
Improve and enforce floodplain ordinances to restrict new construction in the areas	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Flood	McDonough County	Low	The County and Local floodplain managers will work with the local planning departments to review floodplain ordinances. The MHMP planning committee will develop public education options to re-affirm the ordinances in the communities. If local, state, and federal resources are available, implementation of this project will begin within five years.
Improve railroad crossings in McDonough County by adding crossing arms or better signals	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Hazmat, Fire	McDonough County	Low	The County ESDA Director will oversee this project. Local resources, e.g. rail companies, will be used to implement this project, and funding will be sought from local resources and community grants. If funding and resources are available, the project will begin within five years.
Create maps of undermined areas in the county	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Subsidence	McDonough	Low	The County ESDA Engineer will oversee this project. The county will seek assistance from IEMA and community grants. If funding is available, implementation will begin within five years.
Develop ordinances to bury new power lines in subdivisions	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Tornado, Earthquake, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low	The County ESDA Director, municipalities, and utility companies will oversee the implementation of this project. Local and corporate resources will be used to prioritize power lines and bury them. Commissioners and town/village boards will be approached for coordination of the ordinance development. The project is forecasted to be complete within approximately five years.
Upgrade existing and install new warning 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, Flood, Earthquake, Thunderstorm, Winter Storm	Colchester, Macomb	Low	The County ESDA Director will work with local officials on this project. Funding may be sought from the PDM program or community grants. Implementation, if funding is available, is forecasted to begin within five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Post signs in public places for storm shelter locations	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low	The County ESDA Director will oversee the implementation of this project. Local resources will be used for research and funding. Implementation will begin within five years.
Conduct a study to determine potential locations for debris in the event of a hazard	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County	Low	The County ESDA Director will oversee this project. Local resources will be used to research possible debris outlets. Funding for implementation has not been secured as of 2010, but local, state, and federal resources will be sought. Implementation will begin within five years.
Implement snow fences/tree barriers	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Winter Storm	McDonough County	Low	The County Engineer will oversee implementation of this project. Local resources and ILDOT will be used for funding. If funding is available, implementation will begin within five years.
Trim trees to minimize the amount/duration of power outages	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low	The County ESDA Director will coordinate a team to work with utility companies to address this strategy. Funding may come from community grants or local resources. If funding and resources are available, implementation will begin within five years.
Conduct a study to determine availability of 4WD vehicles	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	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low	The County ESDA Director will coordinate this project. Local resources will be used to survey the availability and create a database. Implementation will begin within five years.

Table 5-6: 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 implementations of any mitigation actions. Table 5-4 and 5-5 presents mitigation projects developed by the planning committee, as well as actions that are ongoing or already completed. Since this is the first mitigation plan developed for McDonough County, there are no deleted or deferred mitigation items.

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

5.5 Multi-Jurisdictional Mitigation Strategy

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

Each of the eleven incorporated communities within and including McDonough 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, the McDonough County Emergency Services and Disaster Agency (ESDA) will reconvene the MHMP planning committee to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during November 2015 to address the five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

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

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

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. This updated HAZUS-MH GIS data has been returned to the county for use and maintenance in the county's system. As newer data becomes available, 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 since many of the mitigation projects identified as part of this planning process are ongoing. McDonough County and its incorporated jurisdictions will update the zoning plans and ordinances listed in Table 5-2 as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

6.3 Continued Public Involvement

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

APPENDICES

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 X 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
IDOT - Illinois Department of Transportation

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 – Storm water Pollution Prevention Plan

U

USGS – United States Geological Survey

Appendix A: Multi-Hazard Mitigation Plan Meeting Minutes

IEMA Pre-Disaster Mitigation Plan

Assembly of the McDonough County Planning Team Meeting 1:
Chairman: Dan Kreps, McDonough County ESDA
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: Tuesday, February 9, 2010

Meeting Time: 1 p.m.

Place: McDonough County Health Department (505 E. Jackson St.)

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Megan Carlson	SIUC Geology
Dan Kreps	McDonough County ESDA
David Raymond	City of Bushnell
Merville Hilliard	City of Bushnell
Mary Brown	City of Bushnell
Lynette Cale	McDonough County Health Department
Curt Barker	Macomb Police Department
Joe Heckman	WIU
Ed Lavin	City of Macomb
Tammy Camp	McDonough County
Chad Sperry	WIU
JR Hyde	Macomb Fire Department
John Jessen	McDonough District Hospital
Walter Burnett	Macomb Public Works
Barbara Whedbee	McDonough District Hospital EMS

Introduction to the Pre-Disaster Mitigation Planning Process

The meeting is called to order

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

research assignments, surveys, along with the time spent reviewing and producing the planning document.

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

Jonathan Remo divided the planning project into five to six meetings. At the 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.

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

Meeting was adjourned.

Pre-Hazard Mitigation Planning Meeting
02/09/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
DAN KREPS	MCDONOUGH CO. ESDA	837-2686	mcESDA@mACOMB.com
David Raymond	City of Bushnell	772-2521	
Mary Hilliard	City of Bushnell	772-2521	
Mary Brown	City of Bushnell	772-2521	mab@bushnell.net
Lynnette Cale	McDonough Co. ~~HD~~ Health Department	837-9951 ext 204	LCale@mchdept.com
Curt Barker	Macomb P.D.	(309) 318-0416	cbarker@macombpolice.com
Joe Heckman	WIU	309. 298. 1808	Ja-Heckman@wiu.edu
Ed Lave	CITY OF MACOMB	309-696-4252	EJLAUIN@COMCAST.NET
Tammy Camp	McDonough County	833-5305	tammy@assessor.mcdonoughil.us

Pre-Hazard Mitigation Planning Meeting
02/09/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
Jonathan Reno	SIUC	618-453 7370	diamcat@siu.edu
Chad Sperry	WIU	309 298-2562	ce-sperry@wiu.edu
JR. Hyde	Macomb Fire	309-836-7800	JRhyde@cityofmacomb.com
JOHN JESSEN	McDonough District Hosp	309-836-1555	JCJessen@MDH.org
Walter Burnett	Macomb Public Works	309-833-292[illegible]	pwdirector@city.of macomb.com
Barbara Whedbee	McDonough District Hospital EMS	309-833-4102-11400	bjwhedbee@mdh.org

IEMA Pre-Disaster Mitigation Plan

Assembly of the McDonough County Planning Team Meeting 2:
Chairman: Dan Kreps, McDonough County ESDA
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: Tuesday, March 23, 2010

Meeting Time: 1 p.m.

Place: McDonough County Health Department

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Megan Carlson	SIUC Geology
Dan Kreps	ESDA
Sharon Foulk	
Larry Garth	
Todd Louden	Village of Sciota
Todd Danner	Village of Good Hope
Jack Fayber	Village of Prairie City
Dana Biernbaum	WIU-EM
Joe Heckman	WIU
Walter Burnett	City of Macomb
Chad Sperry	WIU
Curt Barker	MPD
Merville Hilliard	BPD
Mary Brown	Bushnell ESDA
David Raymond	Bushnell Street Department
JR Hyde	Macomb Fire Department
Lynette Cale	McDonough County Health Department
John Jessen	McDonough District Hospital
Barbara Whedbee	McDonough District Hospital- EMS

The meeting was called to order.

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

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

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

#1: Tornado
#2: Fire\Explosion
#3: Thunderstorms/High Winds/Hail/Lightening
#4: Transportation Hazardous Material Release
#5: Winter Storms
#6: Flooding
#7: Drought/Extreme Heat
#8: Earthquake

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

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

Meeting was adjourned.

Pre-Hazard Mitigation Planning Meeting
03/23/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
DAN KREPS	ESDA	309-837-2686	MCESDA@MACOMB.COM
Sharon Foulk		309776-4257	Village Clerk Tennessee
Larry Foulk		309-776 4257	
TODD LOUDEN	VILL OF ~~Good Hope~~ SCIOTA	309.456.3595	
TODD DANNER	VILL OF GOOD HOPE	HALL 456 3620 H# 456 3491	[redacted] T DANNER@WINCO.NET
Jack Fayhee	Vill of Prairie City	309-775-3317	fayhee@bushnell.net
Dana Biernbaum	WIU-EM	309.298.1800	DM-BIERNBAUM@WIU.EDU
Joe Heckman	WIU	309-298-1800	
Walter Burnett	City of Macomb	309-833-2821	pwdirector@cityofmacomb.com
Chad Sparry	WIU	309 298-2562	cr-sparry@wiu.edu

Pre-Hazard Mitigation Planning Meeting
03/23/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
Curt Barker	MPD	(309) 833-4505	cbarker@macomspolice.com
MERVILLE HILLIARD	BPD	772-4052	
MARY BROWN	BUSHNELL ESDA	772-2521	
DAVID RAYMOND	BUSHNELL STREET	772-2521	
J.R. Hyde	Macomb Fire	836-7800	JRHyde@cityofmacomb.com
Lynnette Cale	McDonough County Health Department	837-9951	LCale@mchdupt.com
JOHN JESSEN	McDonough District Hospital	836-1555	JCJESSEN@MDH.org
Barbara Whedbee	McDonough District Hospital EMS	309 833-4102 Ext 11400	bj.whedbee@mdh.org

IEMA Pre-Disaster Mitigation Plan

Assembly of the McDonough County Planning Team Meeting 3:
Chairman: Dan Kreps, McDonough County ESDA
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: May 18, 2010

Meeting Time: 7 p.m.

Place: City Hall Community Room

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Jen Dierauer	SIUC Geology
Dan Kreps	McDonough ESDA
Merville Hilliard	Bushnell Police
David Raymond	Bushnell Street Department
Donna Coates	Bushnell City Clerk
Mary Brown	Bushnell ESDA
Sharon Faulk	Tennessee Village
Larry	Tennessee Village
Curt Barker	Macomb Police Department
Joe Heckman	McDonough ESDA
Barb Whedbee	MDH EMS
Jake Kreps	Blandinsville ESDA
Robbie Phelps	Colchester Police
Todd Danner	Good Hope/Sciota
Don Logan	Village of Tennessee
Dana Biernbaum	WIU-Rish Management and Emergency Prep
Danay Bien	Mayor, City of Colchester
Jack Fayhee	Prairie City Town Board
Jerry Seaver	Industry
Walter Burnett	City of Macomb

The meeting was called to order.

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

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

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

Meeting was adjourned.

Pre-Hazard Mitigation Planning Meeting
05/18/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
JaKE KrePS	Blandinsville ESDA	309-333-4779	Kreps bless@Hotmail.com
Robbie Phelps	Colchester police	309-221-2605	RPhelps@Colchesterpolice.mcdonough.2.il.us.
TODD DANNER	GOOD HOPE / SCIOTA	309 456 3491	TDANNER@WINCO.NET
DON LOGAN	VILLAGE OF TENNESSEE	309-776-3505	
DANA BIERNBAUM	WIU - RISK MGMT & EMERGENCY PREP	309-298-1800	DM-BIERNBAUM@WIU.EDU
DANNY BICE	Mayor City of Colchester	309-313-5250	
Jack Faybee	Prairie City Town Brd	309-255-0130	faybee@bustnet.net
Terry Seaver	Industry	(309)221-3537	
WALTER BURNETT	City of Macomb	309-833-2821	pwdirector@cityofmacomb.com

Pre-Hazard Mitigation Planning Meeting
05/18/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
DAN KREPS	ESDA		MCESDA@MACOMB.COM
MERV HILLIARD	BUSHNELL POLICE		hilliard@bushnell
DAVID RAYMOND	BUSHNELL ST. DEPT		
DONNA COATES	BUSHNELL CITY CLERK		
MARY BROWN	BUSHNELL ESDA		
Sharon Faulk	Tennessee Village		
Larry	Tennessee Village		talithals@winco.net
Curt Barker	Macomb Police Dept	(309)833-4505	cbarker@macombpolice.com
Joe Heckman			
Barb Whedbee	MDH EMS		bjwhedbee@mdh.org

IEMA Pre-Disaster Mitigation Plan

Assembly of the McDonough County Planning Team Meeting 4:
Chairman: Dan Kreps, McDonough County ESDA
Plan Directors: SIUC Geology Department and IUPUI – Polis

Meeting Date: Monday, June 14, 2010

Meeting Time: 10 a.m.

Place: Macomb Police Department

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Beth Elision	SIUC Geology
John Buechler	IUPUI – Polis
Laura Danielson	IUPU – Polis
Todd Louden	Village Sciota
Robbie Phelps	City of Colchester
Willy Carnes	Village of Blandinsville
Terry Seaver	Village of Industry
Dan Kreps	McDonough County ESDA
Mary Brown	Bushnell ESDA
Merv Hilliard	Bushnell Police
David Raymond	Bushnell Street Department
Todd Danner	Village of Good Hope
J.R. Hyde	Macomb Fire Department
Barbara Whedbee	McDonough County Hospital EMS
Curt Barker	Macomb Police Department

The meeting was called to order.

Jonathan Remo thanked everyone for attending the meeting and stated that if the planning team members needed extra mitigation strategy handbooks that they were available upon request. He introduced John Buechler and Laura Danielson from the Polis Center that were also in attendance that day.

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

assessed for each mitigation item. Listed below are the New Mitigation Strategies that the Planning Team came up with:

Mitigation Item	Hazards Addressed	Jurisdictions Covered	Priority
Complete a siren placement study to determine siren coverage	Tornado, Thunderstorm	Bushnell, Macomb	Complete
Establish tie-down ordinances for mobile home parks	Tornado, Thunderstorm	Bushnell, Macomb	Complete
Develop mutual aid agreements, i.e., Illinois Law Enforcement Alarm System (ILEAS) and Mutual Aid Box Alarm System (MABAS)	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County	Complete
Establish a mass notification system	Hazmat	Macomb	Complete
Procure permanent signage for frequently flooded roads	Flood	McDonough County	Complete
Establish Storm Ready Communities	Tornado, Flood, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Ongoing
Conduct a new flood study (DFIRM)	Flood	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High
Increase water storage capacity by dredging lakes	Flood, Drought	Macomb	High
Develop or adapt guidelines or regulations which require higher building and safety standards for new public and governmental buildings to increase disaster resistance throughout the county	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High

Institute a mass notification system, e.g. Reverse 911 or Blackboard Connect, to cover all communities within the county	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	McDonough County	High
Develop hazard mitigation and response protocols in businesses and schools; ensure that residents are aware of the protocols	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High
Procure generators or transfer situations for all essential facilities	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Fire	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	High
Educate the public on the benefits of the NFIP	Flood	Bardolph, Blandinsville, Colchester, Good Hope, Industry, Plymouth, Prairie City, Sciota, Tennessee	Medium
Repair drainage tiles and culverts at Barns and Jackson, 600 block of W. Davis, Harrison and W. Main, Time and Cleveland, and Jackson and Ward	Flood	Bushnell, Macomb	Medium
Establish a first response hazmat team, conduct appropriate training, and procure equipment	Hazmat	McDonough County	Medium
Conduct a commodity flow study	Hazmat	McDonough County, Bushnell, Colchester, Macomb	Medium
Conduct a study to potentially re-engineer intersections with frequent vehicle accidents and complete pre-staged evacuation exercises	Hazmat, Fire	McDonough County, Bushnell, Colchester, Macomb	Medium

Conduct a study to determine shelter capacity in the county	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium
Develop a database of special needs populations to be housed at a facility that can serve as a shelter	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium
Purchase new equipment for managing debris, e.g. chippers and tub grinders	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium
Harden fire and police stations; electric, water, and sewer plants, government buildings, and older university buildings	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium
Establish shelters in mobile home parks and recreational parks and safe rooms in certain residential and commercial buildings	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium

Construct warming centers in each community within the county	Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Medium
Purchase snow removal equipment and de-icing agents	Winter Storm	McDonough County, Bardolph, Blandinsville, Colchester, Good Hope, Industry, Plymouth, Prairie City, Sciota, Tennessee	Medium
Install inertial valves at critical facilities	Earthquake	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low
Establish a watershed tax to improve storm drainage	Flood	Macomb	Low
Improve and enforce floodplain ordinances to restrict new construction in the areas	Flood	McDonough County	Low
Improve railroad crossings in McDonough County by adding crossing arms or better signals	Hazmat, Fire	McDonough County	Low
Create maps of undermined areas in the county	Subsidence	McDonough	Low
Develop ordinances to bury new power lines in subdivisions	Tornado, Earthquake, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low
Upgrade existing and install new warning sirens	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm	Colchester, Macomb	Low

Post signs in public places for storm shelter locations	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low
Conduct a study to determine potential locations for debris in the event of a hazard	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Fire, Subsidence	McDonough County	Low
Implement snow fences/tree barriers	Winter Storm	McDonough County	Low
Trim trees to minimize the amount/duration of power outages	Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low
Conduct a study to determine availability of 4WD vehicles	Winter Storm	McDonough County, Bardolph, Blandinsville, Bushnell, Colchester, Good Hope, Industry, Macomb, Plymouth, Prairie City, Sciota, Tennessee	Low

Pre-Hazard Mitigation Planning Meeting
06/14/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
TODD LOUDEN	VILLAGE OF SCIOTA	309-456-3595	TLOUDEN@WINCO.NET
Robbie Phelps	City of Colchester	309-221-2605	RPhelps@Colchesterpolice.McDonough.IL.us
Willy Carnes	Village of Blandinsville	309-652-3223	bvillewater@hotmail.com
Terry Seaver	Village Of Industry	309 221-3537	seaver_terry@yahoo.com
DAN KREPS	McDONOUGH ESDA		MCESDA@MACOMB.COM
MARY BROWNT	BUSHNELL ESDA		
MERV HILLIARD	BUSHNELL POLICE		
DAVID RAYMOND	Bushnell STREET DEPT		
TODD DANNER	VILLAGE OF GOOD HOPE	309 456 349	
JR Hyde	Macomb Fire	309 836 7800	JRHyde@cityofmacomb.com

Pre-Hazard Mitigation Planning Meeting
06/14/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
Barbara Whedbee	McDonough District Hosp EMS	309 833-4102- Ext 11400	bjwhedbee@mdh.org
Curt Barker	Macomb Police Dept.	309-318-0416	cbarker@macombpolice.com

IEMA Pre-Disaster Mitigation Plan

Assembly of the McDonough County Planning Team Meeting 5:
Chairman: Dan Kreps, McDonough County ESDA Director
Plan Directors: SIUC Geology Department and IUPUI – Polis

Meeting Date: Monday, July 26, 2010

Meeting Time: 10 a.m.

Place: Macomb Police Station Training Room

Planning Team/Attendance:

Lynnette Cale	**McDonough County Health Department**
Sharon Foulk	**Village of Tennessee**
Todd Louden	**Village of Sciota**
Robbie Phelps	**City of Colchester**
Chad Sperry	**Western Illinois University**
Curt Barker	**City of Macomb**
JR Hyde	**City of Macomb**
John Jessen	**McDonough District Hospital**
Joe Heckman	**McDonough ESDA**
Todd Danner	**Village of Good Hope**
Marry Brown	**City of Bushnell**
David Raymond	**City of Bushnell**
Merv Hilliard	**City of Bushnell**
Jake Ellis	**City of Bushnell**
Walter Burnett	**City of Macomb**
Barbara Whedbee	**McDonough District Hospital**

The meeting was called to order.

Lynette Cale opened the meeting with an overview of what was to happen from this point on with the plan. She stated that the plan could be reviewed by the Planning Team members for about 2 weeks so everyone would have ample amount of time look at and review the plan for any discrepancies. She also stated that in approximately 3 weeks the plan would be sent to IEMA/FEMA. They would then review it and if everything is OK with the plan, then we should hear back from IEMA/FEMA hopefully by October for their approval.

Lynette then explained that once it comes back approved, then a Resolution will have to be passed by all municipalities. After they are passed, they needed to be returned Dan Krepps and he will forward them on to FEMA. Once FEMA gets the Resolutions, they will send notification that the municipality has a completed and approved plan.

He also explained that once the plan is submitted to IEMA/FEMA for their review, the municipalities can begin formulating and putting together their projects for funding. .

It was also explained to the planning team that FEMA will require a five-year update to the plan. Lynette told the planning team that in another five years, the members should come together again, most likely under the direction of the ESDA Director, to review the plan and make any necessary changes to it. She xplained that FEMA will probably send out a reminder as to when this is supposed to take place.

After Lynette explained the above process, he pointed out specific tables and places in the plan that needed clarification from the team members. After discussing a few changes, the planning team members looked at the plan for a while longer.

Since there were no more comments about the plan, the meeting was adjourned.

Pre-Hazard Mitigation Planning Meeting
07/26/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
Lynnette Cale	McDonough Co. Health Dept.	309-837-9951	LCale@mchdept.com
Sharon Foulk	Village of Tennessee	309-776-4257	talithals@winco.net
TODD LOUDEN	VILLAGE OF SCIOTA	309-221-8893	TLOUDEN@WINCO.NET
Robbie Phelps	City of Colchester	309-221-2605	RPhelps@colchesterpolice.com McDonough.il.us.
Chad Sperry	WIU	309 298 2562	cc-sperry@wiu.edu
Curt Barker	Macomb P.D	309 318-0416	cbarker@macombpolice.com
JR Hyde	Macomb Fire	309-836-7800	JRHyde@cityofmacomb.com
John Jessen	MOH	309-836-1555	JCJESSEN@MOH.org
Joe Heckman	McDonough EMA		Joseph.Heckman@gmail.com
TODD DANNER	VILLAGE OF GOOD HOPE	309 456 3620	TDANNER@WINCO.NET

Pre-Hazard Mitigation Planning Meeting
07/26/10
(PLEASE PRINT CLEARLY)

NAME	AGENCY/DEPARTMENT	PHONE	E-MAIL
Mary Brown	City of Bushnell	309-772-2521	mab@bushnell.net
David Raymond	City of Bushnell	309-772-2521	
MERV HILLIARD	CITY OF BUSHNELL	309-772-9052	hilliard@bushnell.NET
Jake Ellis	City of Bushnell	309-333-6835	je-ellis@wiu.edu
Walter Burnett	City of Macomb	309-833-2128	pwdirector@city.of.macomb.com
Barbara Whelbee	MDH EMS	309-833-4101 Ext 11400	bjwhedbee@mdh.org

Appendix B: Local Newspaper Articles and Photographs

E-mail to surrounding county officials inviting them to Meeting 3, the public meeting

-----Original Message-----
From: mcesda@macomb.com [mailto:mcesda@macomb.com]
Sent: Tuesday, May 11, 2010 11:19 AM
To: lepc@mchsi.com; esda@farmingtonil.com; schuylerems@casscomm.com
Cc: diamict@siu.edu
Subject: McDonough County Hazard Mitigation Plan

You are cordially invited to the next McDonough County Hazard Mitigation planning meeting. It will be held at the Macomb City Hall, 232 E. Jackson St., at 7 p.m. on May 18th. This meeting will be a public meeting where the planning team will solicit input from the community.

I have attached the news release that will be going out shortly.

Thanks
Dan Kreps
McDonough Co. ESDA

Press-Release for Meeting 2 on March 23, 2010

February 24, 2010

McDonough County Multi-Hazard Mitigation Planning Meeting

In the pursuance of compliance with the federally mandated Disaster Mitigation Act (DMA) of 2000, McDonough County has formed a steering committee and an alliance with Southern Illinois University and The Polis Center of IUPUI to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for McDonough County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality. The plan is unique in that it will utilize state-of-the-art FEMA modeling software to provide casualty and damage estimates, corresponding to a predetermined disaster scenario. The finished plan will then be reviewed and accepted by the steering committee and sent to FEMA for federal approval. Once FEMA approves, all jurisdictions that participate will be eligible for emergency relief funding in the event of a natural disaster. The participating jurisdictions will also be eligible for federal funding to implement the mitigation measures defined in the plan to minimize the effects of a natural disaster. The steering committee needs to have at least one representative from each incorporated city/town in the County.

The McDonough County Hazard Mitigation Steering Committee has scheduled a planning session for:

1:00 p.m. Tuesday, March 23, 2010
Macomb Police Department
120 S. McArthur Street
Macomb, IL 61455

Contact Person for the McDonough County Hazard Mitigation Steering Committee is:

Dan Kreps, Coordinator
McDonough County Emergency Services and Disaster Agency
(309) 776-3058

The Federal Emergency Management Agency (FEMA) now requires **each unit of government** in the United States to have a FEMA-approved MHMP, so completion of the McDonough County plan is critical. The MHMPs will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The steering committee expects to identify the following hazards: flooding, tornado, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, earthquake, and severe winter storms. The committee then selects hazards for The Polis Center and SIU – Carbondale to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others. At the March 23rd meeting, the steering committee will go over the planning process.

FEMA requires participation from all local jurisdictions, before the jurisdiction will be included in the County plan. Your attendance at this meeting is essential. If you are unable to attend please designate an alternate attendee for your jurisdiction, or **your jurisdiction will probably not be eligible for FEMA relief or mitigation funding**. The attendee only needs to be a member of the community, not a representative from the jurisdictions board.

Press Release for Meeting 3, the Public Meeting on May 18, 2010

PUBLIC MEETING ON McDonough COUNTY MULTI-HAZARD MITIGATION PLAN

The McDonough County Multi-Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7:00 p.m. on Tuesday, May 18, 2010 at the Macomb City Hall, 232 E. Jackson St., Macomb. Through a grant, McDonough County ESDA has formed an alliance with The Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) and Southern Illinois University-Carbondale (SIUC) to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for McDonough County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Over the last several months the steering committee has been working with The Polis Center and staff from the SIU-Carbondale Geology Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency for approval.

The Federal Emergency Management Agency (FEMA) now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the McDonough County plan is critical. The MHMP's will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities and unincorporated areas of the county. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The steering committee has identified the following hazards: tornados, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, and severe winter storms. The committee then selected hazards for The Polis Center to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others.

Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

The public is invited to attend the May 18th meeting and the steering committee is interested in receiving public input on the plan.

Public Meeting Announcement in 'The Voice' on May 13, 2010

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Public meeting for hazard plan set for Tuesday

The McDonough County Multi-Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7 p.m. on Tuesday, May 18, at the Macomb City Hall, 232 E. Jackson St., Macomb. Through a grant, McDonough County ESDA has formed an alliance with The Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) and Southern Illinois University-Carbondale to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for McDonough County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Over the last several months the steering committee has been working with The Polis Center and staff from the SIU-Carbondale Geology Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency for approval.

The Federal Emergency Management Agency (FEMA) now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the McDonough County plan is critical. The MHMP's will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities and unincorporated areas of the county. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The steering committee has identified the following hazards: tornados, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, and severe winter storms. The committee then selected hazards for The Polis Center to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others. Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

Appendix C: Adopting Resolutions

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2010.

_____
County Commissioner Chairman

_____
County Commissioner

_____
County Commissioner

_____
Attested by: County Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

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Village Council Member

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Village Council Member

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Village Council Member

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Village Council Member

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Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

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Village Council Member

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Village Council Member

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Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MCDONOUGH COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

BE IT FURTHER RESOLVED, that the McDonough County Emergency Service and Disaster Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

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Village Council Member

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Village Council Member

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Village Council Member

_____
Village Council Member

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Attested by: Village Clerk

Appendix D: NCDC Historical Hazards

Table of Contents

Tornado…….…….. D-2
Flood……. ……. D-3
Thunderstorms/ High Winds/ Hall/ Lightning……..... D-5
Winter Storm……... D-7
Fire……. ……. D-8
Unknown……. D-9

TORNADO

File Name: Tornado_1992_Macomb
Date: July 26, 1992
Description: A tornado ripped through Jackson Heights Trailer Court northwest of Macomb and the Western Illinois University Campus. The tornado blew down trees, utility poles and extensively damaged some homes in the northern sector of the county.
Source: Western Illinois University Historical Archives

File Name:Tornado_1875_Macomb_1
Date: August 4, 1875
Description: Church destroyed by wind August 4, 1875. For more information, see vertical file--Macomb--Tornadoes, Macomb Journal, August 5, 1875. From a stereoscopic view by A.W. Zumbro. The church was located west of Chandler Park at the intersection of Lafayette and Calhoun streets. This Methodist Episcopal Church building was converted in a fire station after the 1875 storm damaged it. The new Methodist Episcopal Church was constructed between 1895 and 1897 at the corner of Carroll and McArthur streets.
Source: Western Illinois University Historical Archives

File Name:Tornado_1875_Macomb_2
Date: August 4, 1875
Description: According to an August 5, 1875 Macomb Journal article, Scott's building was damaged in a tornado on August 4. for more information, see vertical file--Macomb--Tornadoes. According to the 1876 Macomb city directory, Scott's Block was on the southeast corner of the square. David Scott was an undertaker and carried furniture, china, glass, queensware, pictures, and frames. Reproduction or a stereoscopic view. Stereoscopic view by A.W. Zumbro.
Source: Western Illinois University Historical Archives

File Name:Tornado_1975_Macomb_3
Date: August 4, 1875
Description: Photo taken after August 4, 1875 tornado that hit Macomb. For more information, see vertical file--Macomb--Tornadoes, Macomb Journal, August 5, 1875. Reproduction of stereoscopic view. Stereoscopic view by A.W. Zumbro. The Fisher Foundry, owned and operated by Archibald Fisher, was located at 329 North Randolph Street.
Source: Western Illinois University Historical Archives

FLOOD

File Name:Flood_1910_Sciota
Date: June 26, 1910
Description: Main street in Sciota during the June 26, 1910 Flood
Source: Western Illinois University Historical Archives

File Name: Flood_Sciota
Date:
Description: Sciota Flood, photograph by Jeff Mass
Source: Western Illinois University Historical Archives

File Name: Flood_Sciota2
Date:
Description: Sciota Flood, photograph by Jeff Mass
Source: Western Illinois University Historical Archives

THUNDERSTORM/HAIL/WIND

File Name: Thunderstorm_Macomb_1876
Date: Aug 4, 1876
Description: Macomb, like Canton, was struck by a vicious storm, but it occurred nearly 100 years ago. A picture loaned to the Journal's Bicentennial series by Robert Ausbury of Macomb shows a foundry in Macomb that was blown down during a severe storm on Aug 4, 1876
Source: Western Illinois University Historical Archives

File Name: Hail_1960s
Event: Hail Storm
Date: 1960's
Description: Hail Storm 1960? Bill Ahrenkiel's house and yard on Jefferson Street
Source: Western Illinois University Historical Archives

File Name: Hail_1960s_2
Event: Hail Storm
Date: 1960's
Description: Hail Storm 1960? Bill Ahrenkiel's house and yard on Jefferson Street
Source: Western Illinois University Historical Archives

File Name: Wind_Macomb
Event: Wind
Date: Unknown
Description: A large plate glass window and a display in front of a Macomb jewelry store were damaged by a storm, but the date is not known. The store was west of the Macomb National Bank. The jewelry store would have been Rush Jewelry. The 1910 Macomb City Directory shows Rush Jewelry at 114 North Side Square and Macomb National Bank at 116 North Side Square.
Source: Western Illinois University Historical Archives

WINTER STORM

File Name: Snow_1979_Macomb
Date: December, January and February, 1978-79
Description: During the months o f December, January, and February, 1978-1979 a total of 47.8 inches of snow fell in the Macomb area, making it a high since the waterworks plant began maintaining records in 1912. The picture was taken on January 17, 1979, by Frederic T. Marvis of his wife Edith on their sidewalk at 215 West Piper Street. She is 5 foot 5.5 inches tall so estimates can be made of the depth of snow.
Source: Western Illinois University Historical Archives

File Name: Snow_1979_Blandinsville
Date: December, January and February, 1978-79
Description: Scenes like this were typical during the winter of 1978-79 when a total of 47.6 inches of snow fell during December, January, and February. Rural residents were sometimes snowbound for several days before snowplows could open roads which were to clogged for individuals to clear. This is a picture of a road that runs along the south edge of the southwest quarter of section 13, Blandinsville Township.
Source: Western Illinois University Historical Archives

FIRE

File Name: Fire_2010_Macomb1
Event: Fire on the south side of Macomb square
Date: March 5, 2010
Description: Fire started in the basement of a Hallmark store. The fire required the Macomb fire department as well as five other fire departments from the surrounding area to respond (Colchester, Emmet-Chalmers, Good Hope, Monmouth and Canton).
Source: McDonough Voice (McDonoughVoice.com)

File Name: Fire_2010_Macomb2
Event: Fire on the south side of Macomb square
Date: March 5, 2010
Description: fire started in the basement of a Hallmark store. The fire required the Macomb fire department as well as five other fire departments from the surrounding area to respond (Colchester, Emmet-Chalmers, Good Hope, Monmouth and Canton).
Source: McDonough Voice (McDonoughVoice.com)

UNKNOWN

File Name: Storm_Macomb
Event:
Date: Unknown
Description: Macomb Street South McArthur Storm Dirt Street Building
Source: Western Illinois University Historical Archives

File Name: Damage_Kepple
Event: ?
Date: ?
Description: Bardolph Business Kepple Garage building image of the past in McDonough County
Source: Western Illinois University Historical Archives

Appendix E: Historical Hazard Maps

-See Attachment

Appendix F: List of Critical Facilities

Table of Contents

Communication Facilities……...D2
Dams …….....D8
Electric Power Facilities……..……...D9
EOC Facilities …….....D9
Fire Station Facilities……..……...D9
Hazardous Materials……..……...D10
Medical Care Facilities……...D11
Natural Gas Facilities……...D11
Police Station Facilities……...D11
Potable Water Facilities……...D12
Rail Facilities……..……...D12
School Facilities……...D12
Waste Water Facilities……..……...D13
Map of Critical Facilities……..D2

***Replacement cost is in thousands of dollars*

Communication Facilities

ID	Name	Address	City	Class	Owner	Function	ReplaCost
1	WPTM783		MC COMB	CDFLT	Adams		0
2	WPTM784	ON CR 18 310 METERS S OF CR 825N	COLCHES	CDFLT	Adams		0
3	WPTM785	ON CR 18 310 METERS S OF CR 825N	COLCHES	CDFLT	Adams		0
4	KSF515	W OF PIPER & WARD ST	MACOMB	CDFLT	Ameren Services		0
5	KSL32	W OF PIPER & WARD ST	MACOMB	CDFLT	Ameren Services		0
6	WQIV687	US RT 67 2 KM N	Macomb	CDFLT	Ameren Services		0
7	WRI689	1224 MAPLE AVE	MACOMB	CDFLT	AMERICAN RED		2000
8	WLL494	501 N WHITE STREET	MACOMB	CDFLT	AT&T		0
9	WLL494	501 N WHITE STREET	MACOMB	CDFLT	AT&T		0
10	WPXP364	501 N. WHITE STREET	MACOMB	CDFLT	AT&T CORP.		0
11	WPXP367	1600 N. LAFAYETTE STREET	MACOMB	CDFLT	AT&T CORP.		0
12	WPKW256	22959 US HWY 67	GOOD	CDFLT	AULT, SCOTT		0
13	WPKW256		GOOD	CDFLT	AULT, SCOTT		0
14	WQJY701	1699 Bellingham Road	Macomb	CDFLT	Bainter, Chuck		0
15	WQJY701		Macomb	CDFLT	Bainter, Chuck		0
16	KNDJ831	CR 1 MI NW	SCIOTA	CDFLT	BAKER FARMS INC		0
17	KNDJ831	CR 3/4 MI NW	SCIOTA	CDFLT	BAKER FARMS INC		0
18	WQAA349	427 Memorial Hall	Macomb	CDFLT	Barrington Quincy		0
19	WZU361	120 E CALHOUN ST	MACOMB	CDFLT	BARRY, LUAN		0
20	WZU361		MACOMB	CDFLT	BARRY, LUAN		0
21	WNFG727	WALNUT & JEFFERSON ST	BLANDIN	CDFLT	BLANDINSVILLE		2000
22	WNFG727		BLANDIN	CDFLT	BLANDINSVILLE		0
23	KNIV562	800 N OF ST RT 9 ON NORTHWEST ST	BLANDIN	CDFLT	BLANDINSVILLE,		1700
24	KNIV562		BLANDIN	CDFLT	BLANDINSVILLE,		0
25	WQHJ947	115 W. Washington St.	BLANDIN	CDFLT	BLANDINSVILLE,		1800

ID	Name	Address	City	Class	Owner	Function	ReplaCost
26	WQHJ947		BLANDIN	CDFLT	BLANDINSVILLE,		0
27	WPHY779	BNSF MP 214	Tennessee	CDFLT	BNSF Railway Co		0
28	WQFK460	cnr CR500N & CR700E - 5.2mi S of	Colchester	CDFLT	BNSF Railway Co		0
29	WQIW891	BNSF LS11 MP187.4 - HBD	Prairie City	CDFLT	BNSF Railway Co		0
30	WQIX687	BNSF LS11 MP214.0 - HBD	Tennessee	CDFLT	BNSF Railway Co		0
31	WNEX527	cnr CR500N & CR700E - 5.2mi S of	COLCHES	CDFLT	BNSF Railway Co.		0
32	KNHJ901	BNSF MP 187.4 HBD 1.90 MI S	PRAIRIE	CDFLT	BNSF Railway		0
33	WNPZ891	CNR CR500N & CR700E 5.2 MI S OF	COLCHES	CDFLT	BNSF Railway		0
34	WNPZ891	BNSF MP 210.5	COLCHES	CDFLT	BNSF Railway		0
35	WNPZ891		COLCHES	CDFLT	BNSF Railway		0
36	WPKD403	RAILROAD MILEPOST 188.92	BUSHNELL	CDFLT	BNSF Railway		0
37	WPNQ733	BN MP 191.44	BUSHNELL	CDFLT	BNSF Railway		0
38	WPNQ733	BN MP 192.42	BUSHNELL	CDFLT	BNSF Railway		0
39	WPVU577	BNSF MP 210.75 WIU	Colchester	CDFLT	BNSF Railway		0
40	WPVU577	BNSF MP 209.20 WIU	Colchester	CDFLT	BNSF Railway		0
41	WPVU577	BNSF MP 204.5	Macomb	CDFLT	BNSF Railway		0
42	WPVU577	BNSF MP 203.14	Macomb	CDFLT	BNSF Railway		0
43	WPVU577	BNSF MP 200.4	Macomb	CDFLT	BNSF Railway		0
44	KSF889	COURTHOUSE PUBLIC SQ	MACOMB	CDFLT	BUSHNELL FIRE		1800
45	KSF889	410 N DEAN	BUSHNELL	CDFLT	BUSHNELL FIRE		2000
46	WPUD292	1.4KM E OF ST RTS 9 & 41	BUSHNELL	CDFLT	BUSHNELL, CITY OF		2000
47	WPUD292		BUSHNELL	CDFLT	BUSHNELL, CITY OF		0
48	WXT834	148 E HAIL ST	BUSHNELL	CDFLT	BUSHNELL, CITY OF		2000
49	WXT834	127 LUDWIG	BUSHNELL	CDFLT	BUSHNELL, CITY OF		0
50	WXT834		BUSHNELL	CDFLT	BUSHNELL, CITY OF		0
51	WPXY530		Bushnell	CDFLT	Bushnell-Prairie		1800

ID	Name	Address	City	Class	Owner	Function	ReplaCost
52	WQIM936		Macomb	CDFLT	Campus Apartments		0
53	WQKL417	380 EAST MAIN ST	BUSHNELL	CDFLT	CARL SANDBURG		0
54	KNES659	1/2 MI W OF HICKS SCHOOL & 1 MI N	COLCHES	CDFLT	CARSON, WILLIAM		0
55	WPZV561	8785 East 1550th Street	Macomb	CDFLT	Cavett, Lonnie W		0
56	WPZV561		Macomb	CDFLT	Cavett, Lonnie W		0
57	KNKN768	600' WEST OF THE INTERSECTION OF	MACOMB	CDFLT	Cellco Partnership		0
58	KNKN768	7536 East 50th Street	Tennessee	CDFLT	Cellco Partnership		0
59	WPVY846	2740 E. Jackson Street	Macomb	CDFLT	Cellco Partnership		0
60	WQJU745	7536 East 50th Street	Tennessee	CDFLT	Cellco Partnership		0
61	WPOT200	31 EAST SIDE SQ	MACOMB	CDFLT	CENTRAL ILLINOIS		0
62	WPRY398	135 SOUTH CHESTNUT ST	GOOD	CDFLT	CHAT LTD		0
63	WPRY398		GOOD	CDFLT	CHAT LTD		0
64	WRQ685	2 MI NE	GOOD	CDFLT	CHIPMAN, DUANE		0
65	WRQ685		GOOD	CDFLT	CHIPMAN, DUANE		0
66	KFR462	204 E NARKET ST	COLCHES	CDFLT	COLCHESTER FIRE		1700
67	KFR462		COLCHES	CDFLT	COLCHESTER FIRE		0
68	WPMI577	203 MACOMB ST	COLCHES	CDFLT	COLCHESTER		1600
69	WPMI577		COLCHES	CDFLT	COLCHESTER		0
70	KB97167		MACOMB	CDFLT	COLCHESTER		0
71	WLE402	119 W.CARROLL	MACOMB	CDFLT	COLCHESTER		0
72	WLE409	119 W. CARROLL	MACOMB	CDFLT	COLCHESTER		0
73	WLJ966	119 W. CARROOLL ST.	MACOMB	CDFLT	COLCHESTER		0
74	WPWK414	31 EAST SIDE SQUARE	MACOMB	CDFLT	COLCHESTER		0
75	WQDC355	300 WEST DEPOT	COLCHES	CDFLT	COLCHESTER,		2000

ID	Name	Address	City	Class	Owner	Function	ReplaCost
76	WQDC355		COLCHES	CDFLT	COLCHESTER,		0
77	WQJL440	900 Deer Road	Macomb	CDFLT	Computer Masters		0
78	WQJL445	200 East Washington St	Macomb	CDFLT	Computer Masters		0
79	KNFC716	RR 1 3.5 MI N	SCIOTA	CDFLT	COOK, JOHN		0
80	KNFC716	19710 E 900 ST	SCIOTA	CDFLT	COOK, JOHN		0
81	KNFC716		SCIOTA	CDFLT	COOK, JOHN		0
82	WQEC982	17040 E 200th St	Blandinsvi	CDFLT	CROP		0
83	WQEC982		Blandinsvi	CDFLT	CROP		0
84	WQBY584	3.5 MI E ON RT 9	BLANDIN	CDFLT	Dave Hunt Farms Inc		0
85	WQBY584		BLANDIN	CDFLT	Dave Hunt Farms Inc		0
86	WQBA935	15680 E 350th St	Blandinsvi	CDFLT	DeCounter, Mike		0
87	WQBA935		Blandinsvi	CDFLT	DeCounter, Mike		0
88	WPPV707	15620 N 950TH	MACOMB	CDFLT	DORETHY, MIKE		0
89	WPPV707		MACOMB	CDFLT	DORETHY, MIKE		0
90	KNGL635	1 3/4 MI NE	GOOD	CDFLT	DUNSETH,		0
91	KNGL635	1 1/2 MI NE	SCIOTA	CDFLT	DUNSETH,		0
92	KNGL635		SCIOTA	CDFLT	DUNSETH,		0
93	KMK743	2 MI W ON BLACKTOP RD	MACOMB	CDFLT	EMMETT		2000
94	KMK743		MACOMB	CDFLT	EMMETT		0
95	WNYE239	1.75 MI NE	INDUSTR	CDFLT	ESKRIDGE, JAMES B		0
96	WNYE239		INDUSTR	CDFLT	ESKRIDGE, JAMES B		0
97	WNLU683	601 NORTH STATE STREET	MACOMB	CDFLT	ESTES INDUSTRIAL		0
98	WNLU683		MACOMB	CDFLT	ESTES INDUSTRIAL		0
99	WPXH581	18850 E 150TH	BLANDIN	CDFLT	FERGUSON,		0
100	WPXH581		BLANDIN	CDFLT	FERGUSON,		0
101	WQBR462	188850 E 150TH	BLANDIN	CDFLT	Ferguson, Larry J		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
102	WQBR462		BLANDIN	CDFLT	Ferguson, Larry J		0
103	WPAU499	121 CENTER ST	MACOMB	CDFLT	First Student, Inc.		1900
104	WPAU499			CDFLT	First Student, Inc.		0
105	WQGP574	1699 Bellingham Rd	Macomb	CDFLT	Fowler, Louis O		0
106	WQGP574		Macomb	CDFLT	Fowler, Louis O		0
107	KQH888	4 MI SE	INDUSTR	CDFLT	FREEMAN UNITED		0
108	WPQB965	1480 E 1200TH RD	INDUSTR	CDFLT	FREEMAN UNITED		0
109	WPAP917	1 MI S 1/2 MI W OF IL RT 67 & 136	MACOMB	CDFLT	G&M		0
110	WPAP917		MACOMB	CDFLT	G&M		0
111	WPXJ741	1 MI SOUTH&1/2 MI WEST OF JCT 67&136	MACOMB	CDFLT	GALESBURG		0
112	WPXJ741		MACOMB	CDFLT	GALESBURG		0
113	WNIH780	RT 9 1/2 MI W	BUSHNELL	CDFLT	GEM ELECTRONICS		0
114	WNIH780		BUSHNELL	CDFLT	GEM ELECTRONICS		0
115	KQW544	13150 IL HWY 9	GOOD	CDFLT	GOOD HOPE -		2500
116	KQW544		GOOD	CDFLT	GOOD HOPE -		0
117	WNSR912	1/2 MI S	GOOD	CDFLT	GOODPASTURE,		0
118	WNSR912		GOOD	CDFLT	GOODPASTURE,		0
119	WPAT631	CR 500E 1/4 MI N 1500N	MACOMB	CDFLT	HAFFNER FARMS		0
120	WPAT631		MACOMB	CDFLT	HAFFNER FARMS		0
121	WNSA514	4 MI S & 1 MI W	ADAIR	CDFLT	HEATON, MARVIN D		0
122	WNSA514		MACOMB	CDFLT	HAFFNER FARMS		0
123	WPZJ740	318 Pine Street	Adair	CDFLT	Herndon, Jim		0
124	WPZJ740		Adair	CDFLT	Herndon, Jim		0
125	WPLX216	19485 N 1700 RD	BUSHNELL	CDFLT	HESS, STEVE		0
126	WPLX216		BUSHNELL	CDFLT	HESS, STEVE		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
127	KNJQ256	1 MI W OF RT 67	MACOMB	CDFLT	HILLYER		0

128	KNJQ256		MACOMB	CDFLT	HILLYER	0
129	WQCS561	1/4 MI S ON DEER	MACOMB	CDFLT	HILLYER INC	0
130	WQCS561		MACOMB	CDFLT	HILLYER INC	0
131	WYJ868	1.75 MI E OF IL RT 41 ON MARIETTA RD AND	BUSHNELL	CDFLT	HILTON, DAVID	0
132	WYJ868		BUSHNELL	CDFLT	HILTON, DAVID	0
133	WPJI404	1.4 KM E HWYS 9 & 41 ON RD 1850 N	BUSHNELL	CDFLT	Illinois Cooperative	
134	WPJI404		BUSHNELL	CDFLT	Illinois Cooperative	
135	WPLY569	1.4 KM EAST OF INT OF HWY 6 & HWY	BUSHNELL	CDFLT	Illinois Cooperative	
136	WPLY569		BUSHNELL	CDFLT	Illinois Cooperative	
137	WPPH612	1.4 KM E OF INT OF HWY 6	BUSHNELL	CDFLT	Illinois Cooperative	
138	WPRH231	.9 MI E OF ST RTS9 & 41	BUSHNELL	CDFLT	Illinois Cooperative	
139	WPRH231		BUSHNELL	CDFLT	Illinois Cooperative	
140	WPGY549	1200B W JACKSON	MACOMB	CDFLT	ILLINOIS SIGNAL	
141	KYE372	US RT 67 2 MI N	MACOMB	CDFLT	ILLINOIS VALLEY	1800
142	KDN537	SECURITY POLICE DEPT WESTERN AVE &	MACOMB	CDFLT	ILLINOIS, STATE	1800
143	KNAN899	WESTERN IL UNIV TILLMAN HALL	MACOMB	CDFLT	ILLINOIS, STATE	1800
144	KNAO548	TILLMAN HALL WESTERN ILLINOIS UNIV	MACOMB	CDFLT	ILLINOIS, STATE	2000
145	KNHM657	ARGYLE LAKE STATE PK 2 MI N	COLCHES	CDFLT	ILLINOIS, STATE	2500
146	KSA775	US RT 67, 2KM N	MACOMB	CDFLT	ILLINOIS, STATE	2000
147	WAL333	SECURITY POLICE DEPT WESTERN AVE &	MACOMB	CDFLT	ILLINOIS, STATE	2500

ID	Name	Address	City	Class	Owner	Function	ReplaCost

148	WEF526	US ROUTE 67 1 MILE NORTH	MACOMB	CDFLT	ILLINOIS, STATE	1800	1800
149	WNPK630	INT OF WESTERN & MURRAY AVE	MACOMB	CDFLT	ILLINOIS, STATE		
150	WNPK630	MACOMB	CDFLT	ILLINOIS, STATE			2000
151	WNYH443	1034 W JACKSON ST	MACOMB	CDFLT	ILLINOIS, STATE		2500
152	WQLD705	US RT 67 2 KM N	MACOMB	CDFLT	ILLINOIS, STATE		
153	WQLD705	MACOMB	CDFLT	ILLINOIS, STATE			
154	WQN385	SECURITY OFC WESTERN ILL UNIV	MACOMB	CDFLT	ILLINOIS, STATE		1800
155	WQN386	900 W ADAMS	MACOMB	CDFLT	ILLINOIS, STATE		
156	WPSA226	16286 N 1300TH RD	MACOMB	CDFLT	KELSO, WILLIAM		
157	WPSA226	MACOMB	CDFLT	KELSO, WILLIAM			
158	WPJN729	706 N COAL ST	COLCHES	CDFLT	KLEINKOPF FARMS		
159	WPJN729	COLCHES	CDFLT	KLEINKOPF FARMS			
160	WNNA423	ELDORADO RD 3 MI S	ADAIR	CDFLT	KUGLER, MIKE		
161	WNNA423	ADAIR	CDFLT	KUGLER, MIKE			
162	WPUU789	CORNER OF US136 AND 740E COUNTY RD	MACOMB	CDFLT	LAVERDIERE		
163	WPUU789	MACOMB	CDFLT	LAVERDIERE			
164	WQEW244	.9 MI E OF ST RTS 9 & 41	BUSHNELL	CDFLT	LB SPORTS		
165	WPBS599	1/2 MI N CR 1200N ON CR 150E	BLANDIN	CDFLT	LEFLER, TED		
166	WPBS599	BLANDIN	CDFLT	LEFLER, TED			
167	WPBS598	13005 E 150TH ST	BLANDIN	CDFLT	LEWIS, WALTER		
168	WPBS598	BLANDIN	CDFLT	LEWIS, WALTER			
169	WPXH488	15340 N. 700 ROAD	MACOMB	CDFLT	LITCHFIELD FARMS		
170	WPXH488	MACOMB	CDFLT	LITCHFIELD FARMS			

ID	Name	Address	City	Class	Owner	Function	ReplaCost
171	WNEA372	ELDORADO RD 3.8 MI S	ADAIR	CDFLT	LONG JR, GEORGE		
172	WNEA372		ADAIR	CDFLT	LONG JR, GEORGE		

173	WNQN410	1.5 MI S ON WALNUT GROVE RD	WALNUT	CDFLT	LOVEJOY,	
174	WNQN410		WALNUT	CDFLT	LOVEJOY,	
175	KHJ7	MACOMB MUNICIPAL AIRPORT	MACOMB	CDFLT	MACOMB AIRPORT	
176	WBK3	MACOMB MUNICIPAL AIRPORT	MACOMB	CDFLT	MACOMB AIRPORT	1900
177	WRLB2773	MACOMB MUNICIPAL AIRPORT	MACOMB	CDFLT	MACOMB AIRPORT	1900
178	WRLL2148	MACOMB MUNICIPAL AIRPORT	MACOMB	CDFLT	MACOMB AIRPORT	1900
179	WQBX919	Macomb Jr Sr High School 1525 S Johnson	Macomb	CDFLT	Macomb	1900
180	WQBX919	1525 S Johnson Rd	Macomb	CDFLT	Macomb	1800
181	WQBX919	MacArthur School 235 W Grant	Macomb	CDFLT	Macomb	
182	WQBX919	Lincoln School 315 N Bonham	Macomb	CDFLT	Macomb	1800
183	WQBX919	Edison School 521 S Pearl	Macomb	CDFLT	Macomb	1800
184	WQBX919	Dist #185 Office 323 W Washington	Macomb	CDFLT	Macomb	1800
185	WQBX919		Macomb	CDFLT	Macomb	1800
186	WQBX919		Macomb	CDFLT	Macomb	
187	WQBX919		Macomb	CDFLT	Macomb	
188	WQBX919		Macomb	CDFLT	Macomb	
189	WQBX919		Macomb	CDFLT	Macomb	
190	WQBX919		Macomb	CDFLT	Macomb	
191	KSI390	232 E JACKSON	MACOMB	CDFLT	MACOMB	1900

ID	Name	Address	City	Class	Owner	Function	ReplaCost
192	KSI390		MACOMB	CDFLT	MACOMB,		

					CITY OF	
193	WPIF707	LINCOLN HALL WESTERN ILLINOIS	MACOMB	CDFLT	MACOMB, CITY OF	1800
194	WPIF707		MACOMB	CDFLT	MACOMB, CITY OF	
195	WPND548	VARIOUS LOCATIONS	MACOMB	CDFLT	MACOMB, CITY OF	
196	WQAQ811	1412 N. RANDOLPH ST.	MACOMB	CDFLT	MACOMB, CITY OF	1800
197	WQAQ811	1000 N. RANDOLPH ST.	MACOMB	CDFLT	MACOMB, CITY OF	1800
198	WQAQ811	400 E. WALKER ST.	MACOMB	CDFLT	MACOMB, CITY OF	2000
199	WQAQ811	0.4 MI N. OF CR20 ON CR1020 E	MACOMB	CDFLT	MACOMB, CITY OF	1800
200	WRG509	WASHINGTON HALL WESTERN ILL UNIVER	MACOMB	CDFLT	MACOMB, CITY OF	1900
201	WRG509		MACOMB	CDFLT	MACOMB, CITY OF	
202	WYV225	219 W JACKSON	MACOMB	CDFLT	MACOMB, CITY OF	1800
203	WYV225		MACOMB	CDFLT	MACOMB, CITY OF	
204	WPQK571	1.6KM E OF RT 9 & CR E 2400	PRAIRIE	CDFLT	MARIETTA,	
205	WPQK571	0.4KM E CR E 2250 & CR N 1550	MARIETT	CDFLT	MARIETTA,	
206	KNIT369	2 MI N OF RT 136 & TENNESSEE	COLCHES	CDFLT	MC CLURE	
207	KNIT369		COLCHES	CDFLT	MC CLURE	
208	WNXW820	1/2 MI W CR 350 E 2 MI N TENNESSEE	COLCHES	CDFLT	MC CLURE, LEROY	
209	WNXW820		COLCHES	CDFLT	MC CLURE, LEROY	
210	WYK327	LINCOLN HALL WESTERN IL UNIVERSITY	MACOMB	CDFLT	MC DONOUGH	1900
211	WYK327		MACOMB	CDFLT	MC DONOUGH	
212	WNEA258	900 S DEER RD	MACOMB	CDFLT	MC DONOUGH	1900

ID	Name	Address	City	Class	Owner	Function	ReplaCost
213	WNEA258	900 S DEER RD	MACOMB	CDFLT	MC DONOUGH		

214	WNEA258		MACOMB	CDFLT	MC DONOUGH	
215	KBZ252	WASHINGTON HALL WESTERN IL UNIV	MACOMB	CDFLT	MC DONOUGH	1900
216	KNBJ200	WASHINGTON HALL WESTERN IL	MACOMB	CDFLT	MC DONOUGH	1900
217	KNBJ200		MACOMB	CDFLT	MC DONOUGH	
218	WNIY427	110 S MACARTHUR ST	MACOMB	CDFLT	MC DONOUGH	1800
219	WNIY427	W 1/8 M FROM INT. OF ILLINOIS RT 9 &	BLANDEN	CDFLT	MC DONOUGH	1900
220	WNQG245	WASHINGTON HALL WESTERN IL UNIV	MACOMB	CDFLT	MC DONOUGH	1900
221	KNAD757	525 E GRANT ST	MACOMB	CDFLT	MC DONOUGH	1800
222	KNAD757		MACOMB	CDFLT	MC DONOUGH	
223	WNZF425			CDFLT	MC DONOUGH	
224	WPDQ478	525 E GRANT ST	MACOMB	CDFLT	MC DONOUGH	1800
225	WPDQ478		MACOMB	CDFLT	MC DONOUGH	
226	KB8116			CDFLT	MC DONOUGH,	
227	KUL796	WIUM TRANSMITTER BLDG HORN CAMPUS	MACOMB	CDFLT	MC DONOUGH,	2500
228	KUL796	305K MEMORIAL HALL WIU	MACOMB	CDFLT	MC DONOUGH,	1800
229	WSE885	204 S WESTERN	MACOMB	CDFLT	MC DONOUGH,	1900
230	WPLK253	1.6KM NW OF VERMONT LAKE	VERMON	CDFLT	MCCORMICK,	
231	WPLK253		VERMON	CDFLT	MCCORMICK,	
232	WPOC619			CDFLT	MCDONALD S	
233	WQCR623	110 S MCARTHUR ST	MACOMB	CDFLT	MCDONOUGH	1800
234	WQCR623		MACOMB	CDFLT	MCDONOUGH	
235	KNDW207	204 S WESTERN	MACOMB	CDFLT	MCDONOUGH	1900

ID	Name	Address	City	Class	Owner	Function	ReplaCost

236	WPZT291	525 E. GRANT ST	MACOMB	CDFLT	MCDONOUGH	1800
237	WQET463		Macomb	CDFLT	McDonough District	1800
238	WPVJ735	1200B West Jackson Street	Macomb	CDFLT	McDonough Power	
239	WPVJ735		Macomb	CDFLT	McDonough Power	
240	KSI675	525 EAST GRANT ST MCDONOUGH	MACOMB	CDFLT	MCDONOUGH,	1800
241	WQFK649	110 S MCARTHUR STREET	MACOMB	CDFLT	MCDONOUGH,	1800
242	WPLG945	201 N BUSHNELL ST	BLANDIN	CDFLT	MCGAUGHEY,	
243	WPLG945	21050 US HWY 136	ADAIR	CDFLT	MCGAUGHEY,	
244	WPLG945	416 N EDWARDS	MACOMB	CDFLT	MCGAUGHEY,	
245	WPLG945		BLANDIN	CDFLT	MCGAUGHEY,	
246	WPLG945		ADAIR	CDFLT	MCGAUGHEY,	
247	WPLG945		MACOMB	CDFLT	MCGAUGHEY,	
248	WZV353	RR 4 6 MI S RR E	MACOMB	CDFLT	MELVIN, KAREN	
249	WZV353		MACOMB	CDFLT	MELVIN, KAREN	
250	WQGR303		Adair	CDFLT	Meredith, Matt	
251	KRH633	1200B West Jackson Street	MACOMB	CDFLT	METAMORA	
252	WXS336	1200 B.W. JACKSON STREET	MACOMB	CDFLT	METAMORA	
253	KNGZ723	3\4 MI W & 1\4 MI N US 67	MACOMB	CDFLT	MITANDY LAND	
254	KNGZ723		MACOMB	CDFLT	MITANDY LAND	
255	WNYN420	3 MI W	ADAIR	CDFLT	MOORE, LARRY	
256	WNYN420	1.5 MI E	ADAIR	CDFLT	MOORE, LARRY	
257	WNYN420		ADAIR	CDFLT	MOORE, LARRY	
258	WQX780	591A DEER RD	MACOMB	CDFLT	MPC ENERGY, INC.	
259	WQX780	ON HWY 9 1 MI E	BLANDIN	CDFLT	MPC ENERGY, INC.	
260	WQX780		MACOMB	CDFLT	MPC ENERGY, INC.	

ID	Name	Address	City	Class	Owner	Function	ReplaCost
261	WQX780		BLANDIN	CDFLT	MPC ENERGY, INC.		
262	WPWW385	31 EAST SIDE SQUARE	MACOMB	CDFLT	NANCY L. FOSTER		
263	WPYM753	101 MAIN ST	ADAIR	CDFLT	NEW SALEM FIRE		1900
264	WPYM753		ADAIR	CDFLT	NEW SALEM FIRE		
265	WNSS369	1200B W JACKSON	MACOMB	CDFLT	NEXTEL WIP		
266	WNSS369		MACOMB	CDFLT	NEXTEL WIP		
267	WPUF518	320 E. WALKER ST.	MACOMB	CDFLT	NEXTEL WIP		
268	WPUF518		MACOMB	CDFLT	NEXTEL WIP		
269	WQBZ879	900 DEER ROAD	MACOMB	CDFLT	NEXTEL WIP		
270	WQBZ879		MACOMB	CDFLT	NEXTEL WIP		
271	WNWH808	3 MI W & 1 MI S ON 2200E	VERMON	CDFLT	O HERN, LARRY J		
272	WNWH808		VERMON	CDFLT	O HERN, LARRY J		
273	WQKH896	1203 EAST JACKSON STREET	MACOMB	CDFLT	O'REILLY AUTO		
274	WQKH896		MACOMB	CDFLT	O'REILLY AUTO		
275	WNBF926	294 W DAVIS ST	BUSHNELL	CDFLT	PENDARVIS, DAN		
276	WNBF926		BUSHNELL	CDFLT	PENDARVIS, DAN		
277	WQIZ704	1201 N. COLE ST	BUSHNELL	CDFLT	PETERSEN HEALTH		
278	WQIZ704		BUSHNELL	CDFLT	PETERSEN HEALTH		
279	KNEQ580	1 1/4 MI W AND 1 1/2 MI S	TENNESS	CDFLT	PITTENGER, JOHN		
280	WGZ915	MACOMB OFFICE STA 92	MACOMB	CDFLT	PRAIRIE POWER		
281	WGZ872	COLCHESTER SUB STA 96 1MI NE OF	COLCHES	CDFLT	PRAIRIE POWER		
282	WGZ873	TABLE GROVE SUB STA 95 3MI SW OF	TABLE	CDFLT	PRAIRIE POWER		
283	WGZ969	W MACOMB SUB STA 159 0.5MI WEST OF	MACOMB	CDFLT	PRAIRIE POWER		

ID	Name	Address	City	Class	Owner	Function	ReplaCost

284	KRY544	113 SO SIDE SQUARE	MACOMB	CDFLT	PURDUM ELECTRIC	
285	KRY544			CDFLT	PURDUM ELECTRIC	
286	WQJL516	360 S Green Street	Bushnell	CDFLT	Raritan State Bank	
287	KYW251	RR TRACKS AT WALNUT GROVE RD	WALNUT	CDFLT	RIDEN FARM	
288	KYW251		WALNUT	CDFLT	RIDEN FARM	
289	WZB394	2 MILE EAST	MACOMB	CDFLT	RUEBUSH, DEAN	
290	WZB394	1/2 MI W	GOOD	CDFLT	RUEBUSH, DEAN	
291	WQID538	1020 Indian Hollow	Industry	CDFLT	Russell Grain, Inc	
292	WQID538		Industry	CDFLT	Russell Grain, Inc	
293	WNVE609	4.5 MI S	ADAIR	CDFLT	RUSSELL,	
294	WNVE609		ADAIR	CDFLT	RUSSELL,	
295	KVT599	306 E South Street	Industry	CDFLT	SCHUYLER	
296	KVT599		Industry	CDFLT	SCHUYLER	
297	KNCA527	RR2 1 MI W & 3 1/2 MI N	SCIOTA	CDFLT	SCIOTA,	1900
298	KNCA527		SCIOTA	CDFLT	SCIOTA,	
299	WPWV364	19286 E. 1100 ST.	GOOD	CDFLT	SCIOTA, VILLAGE	1800
300	WPWV364	202 JACOB ST.	SCIOTA	CDFLT	SCIOTA, VILLAGE	
301	WPKZ714			CDFLT	SODEXHO	
302	WPGV445	4480 N 1200TH RD	COLCHES	CDFLT	SOWERS, STEVEN	
303	WPGV445		COLCHES	CDFLT	SOWERS, STEVEN	
304	KTE726	ON US 136 2 MI E OF US 67 & 136 JCT	MACOMB	CDFLT	STATE OF	2000
305	WNPM357	1/2 MI N OF SPRING LAKE RD & 1 MI W OF R	MACOMB	CDFLT	SULLIVAN, TIMOTHY	

ID	Name	Address	City	Class	Owner	Function	ReplaCost

306	WNPM357		MACOMB	CDFLT	SULLIVAN, TIMOTHY		
307	WNIG754	WALNUT GROVE RD 3 MI W OF US RT 67	BLANDIN	CDFLT	SUMMERWIND		
308	WNIG754		BLANDIN	CDFLT	SUMMERWIND		
309	WNMZ651	1200 B W JACKSON	MACOMB	CDFLT	SUPREME RADIO		
310	WNMZ651		MACOMB	CDFLT	SUPREME RADIO		
311	WNPU210	1200 B W JACKSON	MACOMB	CDFLT	SUPREME RADIO		
312	WNPU210		MACOMB	CDFLT	SUPREME RADIO		
313	WNWF327	1200B W JACKSON ST	MACOMB	CDFLT	SUPREME RADIO		
314	WNWF327		MACOMB	CDFLT	SUPREME RADIO		
315	WPPF235	1200B W. JACKSON	MACOMB	CDFLT	SUPREME RADIO		
316	WPPF235		MACOMB	CDFLT	SUPREME RADIO		
317	KSE971	1200 B W JACKSON RD	MACOMB	CDFLT	SUPREME RADIO		
318	KSE971		MACOMB	CDFLT	SUPREME RADIO		
319	WPMN447	1200B WEST JACKSON STREET	MACOMB	CDFLT	Supreme Radio		
320	WPMN447		MACOMB	CDFLT	Supreme Radio		
321	WNNN509	1200 B W JACKSON	MACOMB	CDFLT	Supreme Radio		
322	WPZR876	1200B W JACKSON	Macomb	CDFLT	Supreme Radio		
323	WPZR876		Macomb	CDFLT	Supreme Radio		
324	KAW444	1200B WEST JACKSON	MACOMB	CDFLT	SUPREME RADIO		
325	KAW444		MACOMB	CDFLT	SUPREME RADIO		
326	WPGZ515			CDFLT	T BONE INC DBA		
327	WHA718	15210 IL Hwy 9	Good Hope	CDFLT	USCOC OF		
328	WPNE683	2489 E 1700TH ST	INDUSTR	CDFLT	USCOC OF		
329	WPUF993	730 N. BOWER AVE	MACOMB	CDFLT	USCOC OF		
330	WPVR566	1.5 MI W	MACOMB	CDFLT	USCOC OF		
331	WPXK844	8250 E. 150th STREET	TENNESS	CDFLT	USCOC OF		
332	WPYW704	315 UNIVERSITY DRIVE	MACOMB	CDFLT	USCOC OF		
ID	**Name**	**Address**	**City**	**Class**	**Owner**	**Function**	**ReplaCost**

333	403 E. 0TH ST.		PLYMOUTH	CDFLT	USCOC OF	
334	KUP946	220 E WASHINGTON ST	MACOMB	CDFLT	Verizon North Inc.	
335	WNZB201	1.8 MI N OF RT 136 ON BOWER RD	MACOMB	CDFLT	WASTE	
336	WNZB201		MACOMB	CDFLT	WASTE	
337	KSE237	100 BLOCK S COLUMBIA ST	MACOMB	CDFLT	WAYLAND,	
338	KSE237		MACOMB	CDFLT	WAYLAND,	
339	WQAS469	1200 E Grant	Macomb	CDFLT	Wesley Village	
340	WQAS469		Macomb	CDFLT	Wesley Village	
341	WQJG415	1200 E Grant St	Macomb	CDFLT	Wesley Village	
342	WQJG415		Macomb	CDFLT	Wesley Village	
343	WNQU635	1202 W PIPER ST	MACOMB	CDFLT	WEST CENTRAL	
344	WNQU635		MACOMB	CDFLT	WEST CENTRAL	
345	WHG211	3.5 MI SE OF	COLCHES	CDFLT	WEST CENTRAL	
346	WME868	3.5 MI SW OF	COLCHES	CDFLT	WEST CENTRAL	
347	WPQB862	310 S COAL ST	COLCHES	CDFLT	WEST PARIRIE	1800
348	WPQB862		COLCHES	CDFLT	WEST PARIRIE	
349	WPZS448	204 S HUN	COLCHES	CDFLT	WEST PRAIRIE	1800
350	WPZS448		COLCHES	CDFLT	WEST PRAIRIE	
351	WQJR469	21050 US HWY 136	ADAIR	CDFLT	WESTERN GRAIN	
352	WQJR469		ADAIR	CDFLT	WESTERN GRAIN	
353	WMU747	740 W. University Drive, Macomb, IL 6145	MACOMB	CDFLT	WESTERN ILLINOIS	1900
354	WPGE415			CDFLT	WESTERN ILLINOIS	

ID	Name	Address	City	Class	Owner	Function	ReplaCost
355	WPWR682	320 University Drive	Macomb	CDFLT	WESTERN ILLINOIS		1900
356	WQBK411	1 UNIVERSITY CIRCLE	MACOMB	CDFLT	Western Illinois		1900
357	WQDG484	WESTERN IL UNIVERSITY HORN FIELD	MACOMB	CDFLT	WESTERN ILLINOIS		2500
358	WQDR524		MACOMB	CDFLT	WESTERN ILLINOIS		2500
359	WPVW379		MACOMB	CDFLT	WESTERN ILLINOIS		2500
360	WPVW379	TILLMAN HALL WESTERN ILLINOIS	MACOMB	CDFLT	WESTERN ILLINOIS		1800
361	WQCJ500		MACOMB	CDFLT	WESTERN ILLINOIS		
362	WQCJ500	1 UNIVERSITY CIRCLE	MACOMB	CDFLT	WESTERN ILLINOIS		1800
363	WQCA494	730 W. UNIVERSITY DR	MACOMB	CDFLT	WESTERN ILLINOIS		1900
364	WQCA494		MACOMB	CDFLT	WESTERN ILLINOIS		
365	KLT802	S SIDE OF RT 67 BETWEEN SULLIVAN &	INDUSTR	CDFLT	WILLEY OIL INC		
366	WPRZ826	14440 E 2000TH ST	MACOMB	CDFLT	WOLF, DAN		
367	WPRZ826		MACOMB	CDFLT	WOLF, DAN		
368	WXD411	1/2 MI E OF IL RT 61 & 1/2 MI S OF US RT	TENNESS	CDFLT	ZIMMERMAN, JOHN		
369	E030188		MACOMB	CDFLT	Western Illinois		
370	E890396		MACOMB	CDFLT	Western Illinois		

Dams Report

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
1	IRISH LAKE DAM	TRIB EAST FORK LAMOINE RIVER	TENNESSEE	Mary Jane Irish	R	35	
2	MCCLARE EAST POND DAM	TRIB EAST FORK LAMOINE RIVER	TENNESSEE-	Melvin O. McClure	R	30	
3	BLANDINSVILLE CITY RESERVOIR	OFFSTREAM-LITTLE CREEK	BLANDINSVILLE	City of Blandinsville	S	20	
4	VERMONT CITY RESERVOIR DAM	TRIB SUGAR CREEK	VERMONT-	Village of Vermont	RS	36	
5	ARGYLE LAKE DAM	EAST FORK LA MOINE RIVER	COLCHESTER	Illinois Department of	RS	58	
6	PATRICK LAKE DAM	TRIB TROUBLESOME CREEK	MACOMB-	Rick Severs	R	19	
7	FREEMAN	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	47	
8	FREEMAN	TRIB GRINDSTONE CREEK	INDUSTRY	Freeman United Coal	O	28	
9	FREEMAN	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	31	
10	FREEMAN	TRIB GRINDSTONE CREEK	INDUSTRY	Freeman United Coal	O	30	
11	FREEMAN	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	16	
12	FREEMAN	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	46	
13	FREEMAN UNITED/INDUSTRY/3S	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	59	
14	FREEMAN	TRIB GRINDSTONE CREEK	DODDSVILLE	Freeman United Coal	O	26	
15	FREEMAN UNITED/INDUSTRY/POND	TRIB GRINDSTONE CREEK	NONE	Freeman United Coal	D	21	
16	FREEMAN	TRIB GRINDSTONE CREEK	BEAVER	Freeman United Coal	D	28	
17	FREEMAN UNITED/INDUSTRY/POND	TRIB GRINDSTONE CREEK	NONE	Freeman United Coal	O	28	

18	BLANDINSVILLE STORAGE 2 DAM	TRIB LAHARPE CREEK	NONE	Village of Blandinsville	S	37
19	FREEMAN UNITED/INDUSTRY/POND	TRIB GRINDSTONE CREEK	NONE	Freeman United Coal	O	39
20	FREEMAN UNITED/INDUSTRY/POND	TRIB GRINDSTONE CREEK	NONE	Freeman United Coal	C	29

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
21	SPRING LAKE DAM	SPRING CREEK	COLCHESTER	CITY OF MACOMB	SR	41	
22	CRICKETWOOD GREEN LAKE DAM	TRIB-TROUBLESOME CREEK	FANDON	1ST FEDERAL	R	26	

Electric Power Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
1	BUSHNELL MUNICIPAL	175 CHARLES ST	BUSHNELL	EDFLT			1946	9000

EOC Facilities Report

ID	Name	Address	City	Class	YearBuilt	ShelterCap	Stories	ReplaCost
1	Mc Donough Civil Defense	1 COURT HOUSE SQ	Macomb	EFEO				$10000
2	Macomb PD	120 S MCARTHUR ST	MACOMB	EDFLT				$15000

FireStation Facilities Report

ID	Name	Address	City	Class	Stories	YearBuilt	ReplaCost
1	Bushnell Fire Protection District	410 N Dean ST	Bushnell	EFFS	1		500
2	Emmet-Chalmers Fire Protection	3041 W Adams RD	Macomb	EFFS	1		500
3	Macomb Fire Dept	219 W Jackson ST	Macomb	EFFS	2		1976
4	New Salem FPD	102 W Main ST	Adair	EFFS	1		500
5	Industry FPD	104 S Sullivan ST	Industry	EFFS	1		500
6	Blandinsville-Hire Fire	110 E Jefferson ST	Blandinsville	EFFS	1		500
7	Good Hope - Sciota Fire	145 W MAIN ST	Good Hope	EFFS	1		500

ID	Name	Address	City	Class	Stories	YearBuilt	ReplaCost
8	Colchester Fire Protection	210 E MARKET ST	Colchester	EFFS	1		500

Hazardous Materials

ID	Name	Address	City	Class	EPAID	ChemicalName
1	CONTIGROUP COS. INC. WAYNE	RTE. 9 W.	BUSHNELL	HDFLT	IDL080005812	ZINC COMPOUNDS
2	VAUGHAN & BUSHNELL MFG. CO.	146 S. WASHINGTON	BUSHNELL	HDFLT	ILD006300602	TOLUENE
3	VAUGHAN & BUSHNELL MFG. CO.	146 S. WASHINGTON	BUSHNELL	HDFLT	ILD006300602	DI(2-ETHYLHEXYL)
4	VAUGHAN & BUSHNELL MFG. CO.	201 W. MAIN	BUSHNELL	HDFLT	ILD006300602	LEAD
5	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	AMMONIA
6	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	ARSENIC
7	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	BARIUM COMPOUNDS
8	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	CHROMIUM
9	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	COPPER COMPOUNDS
10	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	LEAD COMPOUNDS
11	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	MANGANESE
12	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	NICKEL
13	FREEMAN UNITED COAL MINING	1408 E. 1200TH ST.	INDUSTRY	HDFLT	ILD981187727	ZINC COMPOUNDS
14	NTN-BOWER CORP.	711 N. BOWER RD.	MACOMB	HDFLT	ILD006536395	CHROMIUM
15	NTN-BOWER CORP.	711 N. BOWER RD.	MACOMB	HDFLT	ILD006536395	MANGANESE
16	NTN-BOWER CORP.	711 N. BOWER RD.	MACOMB	HDFLT	ILD006536395	NICKEL
17	HELENA CHEMICAL COMPANY	9960 E 2100TH ST	ADAIR	HDFLT	AMMONIA	
18	WEST CENTRAL FS, INC	8605 E 2250TH ST	ADAIR	HDFLT	TRIMETHYLBENZE	
19	UAP RICHTER	17040 E 200TH ST	BLANDINSVILLE	HDFLT	DIMEHOATE	
20	PIONEER HI-BRED INTERNAITONAL	13150 IL HWY 9	GOOD HOPE	HDFLT	SULFURIC ACID	
21	RIDEN FARM SUPPLY, INC	17905 N 2300TH RD	GOOD HOPE	HDFLT	ATRAZINE	

Medical Care Facilities Report

ID	Name	Address	City	Class	Function	Beds	Stories	ReplaCost
1	MCDONOUGH DISTRICT	525 EAST GRANT STREET	MACOMB	EFHM	Hospital	113	4	100000
2	ELMS NURSING HOME	1212 MADELYN AVENUE	MACOMB	MDFLT	NursHome	98	1	15000
3	WESLEY VILLAGE	1200 EAST GRANT STREET	MACOMB	MDFLT	NursHome	73	1	9000
4	GRAND PRAIRIE ASSISTED	1307 MEADOWLARK LANE	MACOMB	MDFLT	AstdLiving	48	1	5000
5	BICKFORD COTTAGE OF	1600 MAPLE AVENUE	MACOMB	MDFLT	AstdLiving	28	1	3000
6	HEARTLAND	8 DOCTORS LANE	MACOMB	EFHM	NursHome	80	1	15000
7	COUNTRYVIEW CARE	400 W GRANT	MACOMB	MDFLT	NursHome	1		
8	COURTYARD ESTATES	1201 N COLE ST	BUSHNELL	MDFLT	AstdLiving			
9	PRAIRIE CITY REHAB AND	825 E MAIN	PRAIRIE CITY	MDFLT	NursHome	47		

Natural Gas Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
1	Bushnell South Substation	696 E Hail St	Bushnell	NGCV			1964	1600

Police Station Facilities Report

ID	Name	Address	City	Class	Stories	ShelterCap	YearBuilt	ReplaCost
1	Mc Donough County Sheriff	110 S Mcarthur St	Macomb	EFPS	2		1964	3000
2	Macomb Police Department	120 S Mcarthur St	Macomb	EFPS	1		1996	2361
3	Colchester Police Dept	203 Macomb St	Colchester	EFPS	1		1975	238
4	Bushnell Police Dept	410 N Dean St	Bushnell	EFPS	1		1940	500

5	ISP District 14 HQ	1600 N Lafayette St	Macomb	EFPS	1		1936	3000
6	ISP Division of Criminal Inv	1034 W Jackson St	Macomb	EFPS	1			
7	Blandinsville Police Dept	115 W Washington St	Blandinsville	EFPS	1	5	1980	200
8	Western Illnois University Public	1 University Circle	Macomb	EFPS	1			

Potable Water Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
1	BLANDINSVILLE WTP	WATER STREET	BLANDINSVIL					36963
2	MACOMB WTP	1415 N RANDOLPH ST	MACOMB					36963
3	PRAIRIE CITY WTP	R.R. #1 2 MI SOUTH OF RTE 9	PRAIRIE CITY					36963
4	VERMONT WTP	1185 Elmira Rd	VERMONT					36963
5	Bushnell WTP	256 N Dean St	Bushnell					1400
6	Good Hope WTP	125 N Walnut St	Good Hope					36963

Rail Facilities Report

ID	Name	Address	City	Class	Function	DailyTraffic	YearBuilt	ReplaCost
1	Macomb Travel Center	120 E Calhoun St	Macomb	RDFLT	Passenger		1987	300
2	Rail Grain Shuttle Facility	21050 US HWY 136	Macomb	RDFLT	Grain		2009	25000

School Facilities Report

ID	Name	Address	City	Class	Students	Stories	YearBuilt	ReplaCost
1	INDUSTRY ELEMENTARY	306 E SOUTH ST	INDUSTRY	EFS1	90	1	1954	1106.0555
2	BUSHNELL-PRAIRIE CITY HIGH	845 N WALNUT ST	BUSHNELL	EFS1	237	1	1954	4077.6581

3	BUSHNELL-PRAIRIE CITY JR	847 N WALNUT ST	BUSHNELL	EFS1	182	1	1980	2684.0281
4	BUSHNELL-PRAIRIE CITY ELEM	345 E HESS ST	BUSHNELL	EFS1	448	1	1980	6572.9194
ID	**Name**	**Address**	**City**	**Class**	**Students**	**Stories**	**YearBuilt**	**ReplaCost**
5	LINCOLN ELEM SCHOOL	315 N BONHAM ST	MACOMB	EFS1	488	1	1956	8496.4729
6	MACOMB JUNIOR HIGH SCHOOL	1525 S JOHNSON ST	MACOMB	EFS1	258	1	1970	3804.8311
7	EDISON ELEMENTARY	521 S PEARL ST	MACOMB	EFS1	387	2	1956	5707.2466
8	WEST PRAIRIE HIGH SCHOOL	18575 E 800TH ST	SCIOTA	EFS1	251	1	1959	4318.5324
9	WEST PRAIRIE NORTH	100 N WASHINGTON ST	GOOD HOPE	EFS1	121	1	1975	1487.0302
10	WACS REGIONAL	130 S LAFAYETTE STE200	MACOMB	EFS1	123	2		2116.2529
11	PROJECT INSIGHT	330 N MACARTHUR	MACOMB	EFS1	50	1	1956	860.2654
12	ACADEMY FOR SECONDARY	341 S JOHNSON	MACOMB	EFS1	123	1	1976	2116.2529
13	MCDONOUGH CTY LRN CTR	341 S JOHNSON	MACOMB	EFS1	4	1	1976	68.8212
14	WEST PRAIRIE MIDDLE	600 S HUN ST	COLCHESTER	EFS1	225	1	1969	3318.1666
15	WEST PRAIRIE SOUTH	310 S COAL ST	COLCHESTER	EFS1	178	1	1955	2187.5321
16	MACARTHUR EARLY	235 W GRANT ST	MACOMB	EFS1	101	1	1952	1241.2401
17	MACOMB SENIOR HIGH SCHOOL	1525 S JOHNSON RD	MACOMB	EFS1	642	1	1976	11613.583
18	ST PAUL ELEMENTARY	322 W WASHINGTON ST	MACOMB	EFS1	127	1	1959	1560.7673
19	CALVARY BAPTIST CHRISTIAN	1315 MAPLE AVENUE	MACOMB	EFS1	52	1	1976	766.8652

WasteWater Facilities Report

ID	Name	Address	City	Function	Class	Stories	YearBuilt	ReplaCost
1	BARDOLPH STP	P.O. BOX 25	BARDOLPH	WDFLT				73926
2	BUSHNELL EAST STP	138 EAST HAIL STREET	BUSHNELL	WDFLT				73926
3	BUSHNELL WEST STP	19210 E 2000th St	BUSHNELL	WDFLT				73926
4	COLCHESTER STP	600 SOUTH FULTON	COLCHESTER	WDFLT				73926
5	GEORGETOWN HOME	3025 WEST ADAMS ROAD	MACOMB	WDFLT				73926
6	GOOD HOPE SD STP	IL Hwy 9	GOOD HOPE	WDFLT				73926

ID	Name	Address	City	Function	Class	Stories	YearBuilt	ReplaCost
7	INDUSTRY STP	N Downen St	INDUSTRY	WDFLT				73926
8	MACOMB WWTP CITY	901 WEST GRANT STREET	MACOMB	WDFLT				73926
9	PRAIRIE CITY STP	N Nassau St	PRAIRIE CITY	WDFLT				73926
10	MEADOWBROOK SUBD	132 Barsi Blvd	MACOMB	WDFLT				73926
11	WEST PRAIRIE HIGH	18575 E 800TH ST	SCIOTA	WDFLT				73926
12	COUNTRY AIRE	9823 US HWY 136	MACOMB	WDFLT				73926
13	IL DNR ARGYLE STATE	640 ARGYLE PARK RD	COLCHESTER	WDFLT				73926

Map of Critical Facilities

-see attachment

Appendix G: Top ten flood flows from the USGS Stream Gauge Data for McDonough County

Station	Macomb, IL		Bushnell, IL		Colmar, IL	
River	Wigwam Hollow Creek		Drowning Fork		La Moine River	
Period of Record	1961-1976		1961-1992		1945-2008	
Latitude	40.4847		40.5625		40.3302	
Longitude	90.7069		90.5231		90.8961	
Rank	Year	Discharge (cfs)	Year	Discharge (cfs)	Year	Discharge (cfs)
1	1961	539	1980	3500	1985	38900
2	1970	397	1977	1680	1986	28700
3	1974	386	1961	1650	1970	27000
4	1973	342	1990	1500	2002	24000
5	1971	303	1969	1330	1990	20800
6	1965	277	1970	1220	1948	20300
7	1971	249	1974	1140	1961	19800
8	1962	227	1982	1040	1980	19400
9	1964	220	1982	991	1996	18400
10	1975	220	1976	961	1993	17200