



**MULTI-HAZARD MITIGATION  
PLAN UPDATE**

**Hancock County, Indiana**

Prepared for:

**Hancock County, Indiana  
Town of Cumberland, Indiana  
Town of Fortville  
City of Greenfield, Indiana  
Town of McCordsville, Indiana  
Town of New Palestine, Indiana  
Town of Spring Lake, Indiana**

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CBBEL Project No. 14-690

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## CHAPTER 1

## INTRODUCTION

## 1.1 DISASTER LIFE CYCLE

The Federal Emergency Management Agency (FEMA) defines the disaster life cycle as the process through which emergency managers respond to disasters when they occur; help people and institutions recover from them; reduce the risk of future losses; and prepare for emergencies and disasters. The disaster life cycle, **Figure 1-1** includes 4 phases:



Figure 1-1 Disaster Life Cycle

- **Response** – the mobilization of the necessary emergency services and first responders to the disaster area (search and rescue; emergency relief)
- **Recovery** – to restore the affected area to its previous state (rebuilding destroyed property, re-employment, and the repair of other essential infrastructure)
- **Mitigation** – to prevent or to reduce the effects of disasters (building codes and zoning, vulnerability analyses, public education)
- **Preparedness** – planning, organizing, training, equipping, exercising, evaluation and improvement activities to ensure effective coordination and the enhancement of capabilities (preparedness plans, emergency exercises/training, warning systems)

The Hancock County Multi-Hazard Mitigation Plan (MHMP) focuses on the mitigation phase of the disaster life cycle. According to FEMA, mitigation is most effective when it's based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. The MHMP planning process identifies hazards, the extent that they affect the municipality, and formulates mitigation practices to ultimately reduce the social, physical, and economic impact of the hazards.

## 1.2 PROJECT SCOPE AND PURPOSE

### REQUIREMENT §201.6(d)(3):

*A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.*

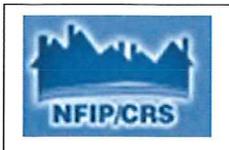
A MHMP is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). According to DMA 2000, the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of occurrences.

A FEMA-approved MHMP is required in order to apply for and/or receive project grants under the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Severe Repetitive Loss (SRL). FEMA may require a MHMP under the Repetitive Flood Claims (RFC) program. Although the Hancock County MHMP meets the requirements of DMA 2000 and eligibility requirements of these grant programs, additional detailed studies may need to be completed prior to applying for these grants.

In order for National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP. The Indiana Department of Homeland Security (IDHS) and the United States Department of Homeland Security (US DHS)/FEMA Region V offices administer the MHMP program in Indiana. As noted above, it is required that local jurisdictions review, revise, and resubmit the MHMP every 5 years. MHMP updates must demonstrate that progress has been made in the last 5 years to fulfill the commitments outlined in the previously approved MHMP. The updated MHMP may validate the information in the previously approved Plan, or may be a major plan rewrite. The updated MHMP is not intended to be an annex to the previously approved Plan; it stands on its own as a complete and current MHMP.

The Hancock County MHMP Update is a multi-jurisdictional planning effort led by the Hancock County Surveyor's Office. This Plan was prepared in partnership with Hancock County, the Town of Cumberland, the Town of Fortville, the City of Greenfield, the Town of McCordsville, the Town of New

Palestine, and the Town of Spring Lake. Representatives from these communities attended the Committee meetings, provided valuable information about their community, reviewed and commented on the draft MHMP, and assisted with local adoption of the approved Plan. As each of the communities had an equal opportunity for participation and representation in the planning process, the process used to update the Hancock County MHMP satisfies the requirements of DMA 2000 in which multi-jurisdictional plans may be accepted.



Throughout this Plan, activities that could count toward Community Rating System (CRS) points are identified with the NFIP/CRS logo. The CRS is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the 3 goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote education and awareness of flood insurance. Savings in flood insurance premiums are proportional to the points assigned to various activities. A minimum of 500 points are necessary to enter the CRS program and receive a 5% flood insurance premium discount. This MHMP could contribute as many as 294 points toward participation in the CRS. At the time of this planning effort, none of the Hancock County communities participate in the CRS program.

Funding to update the MHMP was made available through a FEMA/DHS PDM grant awarded to the Hancock County Surveyor's Office and administered by IDHS. Hancock County provided the local 25% match required by the grant. Christopher B. Burke Engineering, LLC (CBBEL) was hired to facilitate the planning process and prepare the Hancock County MHMP under the direction of an American Institute of Certified Planners (AICP) certified planner.

### 1.3 PLANNING PROCESS

#### **REQUIREMENT §201.6(c)(1):**

*The plan shall document the planning process used to prepare the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Preparation for the Hancock County MHMP Update began in 2013 when the County Surveyor submitted a PDM Grant application to IDHS. The grant request was approved by FEMA and grant funds were awarded in 2015.

Once the grant was awarded, the planning process to update the 2007 MHMP took 12 months. This included a 8 month planning process, followed by a

review period by IDHS and FEMA for the draft MHMP Update, and another month for Hancock County, the Town of Cumberland, the Town of Fortville, the City of Greenfield, the Town of McCordsville, the Town of New Palestine, and the Town of Spring Lake to adopt the final MHMP Update.

### 1.3.1 Planning Committee and Project Team

In June of 2015, the Surveyor's Office compiled a list of Planning Committee members to guide the MHMP Update planning process. These individuals were specifically invited to serve on the Committee because they were knowledgeable of local hazards; have been involved in hazard mitigation; have the tools necessary to reduce the impact of future hazard events; and/or served as a representative on the original Planning Committee in 2007. **Table 1-1** lists the individuals that participated on the Committee and the entity they represented.

**Table 1-1 MHMP Update Committee**

NAME	TITLE	REPRESENTING
Robert Allen	LEPC Chair/Fire/Paramedic	Sugar Creek Fire Department
Dede Allender	Program Educator	Hancock County Solid Waste District
Roy Ballard	Extension Educator	Purdue University
Jarrold Beeson	Director of Special Projects	9 Star Connect
John Begovich	Fire Chief	Sugar Creek Fire Department
Tracie Belongia	Program Coordinator/Survey Tech	Hancock County
George Boaz	Deputy Director	Hancock County EMA
Susan Bodkin	Surveyor/Floodplain Admin	Hancock county
Brad Burkhart	Chief Deputy	Hancock County Sheriff's Department
Jeff Conley	Line Superintendent	Ninestar
Lori Cooley		Hancock Regional Hospital
Michael Crider	Indiana Senate	Elected Official
Ron Crider	Public Works	Town of McCordsville
Dennis Cutteridge	Keihin	Keihin - Hancock County
Mike Dale	Planning Director	Hancock County
Martin Ebbert	Maintenance	Town of Shirley
Robert Ehle	Chief	Town of New Palestine
Ben Esterline	District Coordinator	IDHS
Joannie Fitzwater	City Planning Director	City of Greenfield
Michael Fruth	Director of Utilities	City of Greenfield
Chelly Gracy	GIS Tech	Hancock County
David Heiniger	Security Coordinator	Hancock Regional Hospital
Brad Henderson	Facilities and Special Projects Manager	Nine Star Connect
Joe Hollis	Transportation	Hancock County
Terry Hulen	Battalion Chief	Sugar Creek Fire Department
John Jester	Police Chief	City of Greenfield
Matt Kelly	911 Center	Hancock County

Bill Knauer	Police Chief	Town of Fortville
Ben Lipps	E.M. Liaison	Town of Cumberland
John Milburn	GIS Coordinator	Hancock County
Misty Moore	Director	Hancock County EMA
Joe Munden	Captain	Greenfield Police Department
Bruce Nulliner		Sugar Creek Fire Department
Rudy Nylund	Coroner's Office	Hancock County
Christine Owens	Floodplain Admin	Town of Cumberland
Jim Peters	Salvation Army	Hancock County Shelters
George Plinsinski	Engineering Supervisor	Ninestar
Joe Renner	Town Manager	Town of Fortville
Jimmy Roberts	Fire Chief	City of Greenfield
Mike Shepherd	Sheriff	Hancock County
Dave Sutherin	Liaison	Hancock County Firefighters Mutual Aid
Andrew Swain	Town Council President	Town of Spring Lake
Teri Sweet	Office Manager	Hancock County Plan Commission
Karla Vincent	Engineer	City of Greenfield
Brent Wakeland	Environmental Health Specialist	Hancock County
Scott Williams	Building Official	Hancock County
Steve Yagelski	Director of Utilities	Town of Cumberland

Members of the Committee participated in the MHMP Update as a Planning Committee member or through various other group meetings. During these meetings, the Committee revisited existing (in the 2007 MHMP) and identified new critical infrastructure and local hazards; reviewed the State's mitigation goals and updated the local mitigation goals; reviewed the most recent local hazard data, vulnerability assessment, and maps; evaluated the effectiveness of existing mitigation measures and identified new mitigation projects; and reviewed materials for public participation. A sign-in sheet recorded those present at each meeting to document participation. Meeting agendas and summaries are included in **Appendix 2**. Members of the Committee attended the public meeting in **May 2016** and assisted with adoption of the Hancock County MHMP Update.

### 1.3.2 Public Involvement

A draft of the Hancock County MHMP Update was posted online on the County website for public review and comment. Committee members were provided with an informational flyer to display in their respective offices.

A public meeting was held on **May x, 2016** in the **Hancock Regional Hospital**. Members of the Committee were present to describe details of the plan as well as to answer questions presented by attendees. The media release and power point presentation are located in **Appendix 3**.

### 1.3.3 Involvement of Other Interested Parties

Interested agencies, businesses, academia, and nonprofits were invited to review and comment on the draft Hancock County MHMP Update (Appendix 3). Information related to the planning process, the public meeting, and the availability of the draft Hancock County MHMP was directly provided to such potentially interested parties via personal conversations, informational flyer, and press releases. Successful implementation and future updates of the Hancock County MHMP Update will rely on the partnership and coordination of efforts between such groups.

## 1.4 PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

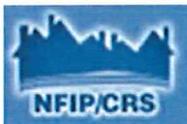
### REQUIREMENT §201.6(c)(1):

*The plan shall include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

During the development of the Hancock County MHMP Update, several relevant sources of information were reviewed either as a document, or through discussions with local personnel. This exercise was completed to gather updated information since the development of the original Hancock County MHMP, and to assist the Committee in developing potential mitigation measures to reduce the social, physical, and economic losses associated with hazards affecting Hancock County.

For the purposes of this planning effort, the following materials (and others) were discussed and utilized:

- Hancock County Zoning Ordinance (2014)
- City of Greenfield Comprehensive Plan (Draft) (2015)
- The Cumberland Comprehensive Plan 2031 (2011)
- Town of McCordsville Comprehensive Plan (2011)



The CRS program credits NFIP communities a maximum of 100 points for organizing a planning committee composed of staff from various departments; involving the public in the planning process; and coordinating among other agencies and departments to resolve common problems relating to flooding and other known natural hazards.

## CHAPTER 2

# COMMUNITY INFORMATION

Although much of the information within this section is not required by DMA 2000, it is important background information about the physical, social, and economical composition of Hancock County necessary to better understand the Risk Assessment discussed in **Chapter 3**.

Hancock County, organized in 1828, is named after John Hancock, President of the Continental Congress, and signatory of the Declaration of Independence. The total area of Hancock County is approximately 307 square miles. The location of Hancock County within the State of Indiana is identified in **Figure 2-1**.

### 2.1 POPULATION AND DEMOGRAPHICS



*Figure 2-1 Hancock County Location*

The most recent data for Hancock County estimates that the 2015 population was 72,520, which ranks 22<sup>nd</sup> in the State. Of that total, the City of Greenfield accounts for 21,398 or 29.5% of the county's population while the Town of Fortville is the third largest community with 3,953 or 5.5% of the population.

In 2014, the median age of the population in the County was 40.3 years of age. The largest demographic age groups in the County are older adults (45-64 years) with a population of 20,436, and young adults (24-44 years) with a population of 17,584. School aged children (5-17) are the third largest age group with a population of 13,433 individuals living in Hancock County. The approximate median household income in 2014 was reported to be \$68,334 while the poverty rate in the same year was reported at 6.9% county-wide. In total, 24.4% of households are married with children, and 34.5% of households are married without children.

Nearly 93.6% of the adults, older than 25, within the County have reportedly completed a High School education. Further, 26.7% of those same adults have also completed a Bachelor of Arts or higher degree.

### 2.2 EMPLOYMENT

US Census data indicates that of the Hancock County work force, 15.2% are employed in professional or technical positions. Manufacturing and Other/Private account for 15.1% and 16.6% respectively. The total

resident labor force according to estimates in 2015 is 37,332 with 1,562 unemployed and an unemployment rate of 4.2% or 68<sup>th</sup> in the State out of 92 counties.

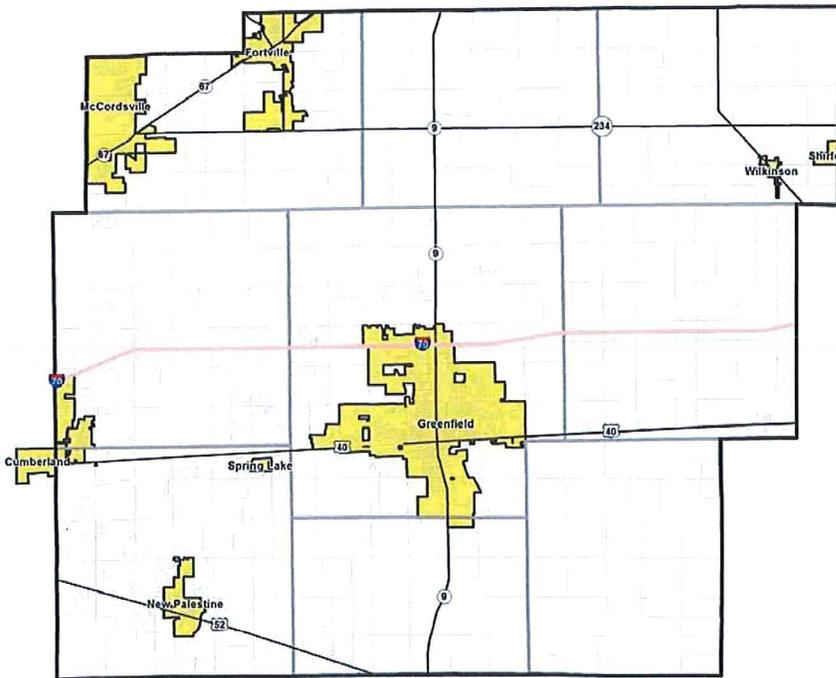
**Table 2-1 List of Major Employers**

Keihin North America Inc	Novelty Inc.
Covance	S Abraham & Sons
Hancock Regional	Formica Corp
Eli Lilly & Co.	Precoat Metals
Indiana Automotive Fasteners	Service Engineering Inc

*(Hancock County Economic Development Corporation 2015)*

**2.3 TRANSPORTATION AND COMMUTIING PATTERNS**

There are several major transportation routes passing through Hancock County and the municipalities within. Interstate 70, US Routes 40 and 52, and State Roads 9, 136, 67, and 234 serve as main routes between the various municipalities. A number of rail lines also traverse the county. These transportation routes are identified in **Figure 2-2**.



**Figure 2-2 Hancock County Transportation Routes**

According to the Indiana Business Research Center, nearly 5,100 people commute into Hancock County on a daily basis. Approximately 33% of these commuters travel from Marion County. Further, approximately 18,500 Hancock County residents commute to other counties with the majority traveling to Marion County (37%).

**Figure 2-3** indicates the number of workers 16 and older who do not live within Hancock County but commute into Hancock County for employment purposes. Similarly, **Figure 2-4** indicates the number of

Hancock County residents 16 and older that commute out of the county for employment.

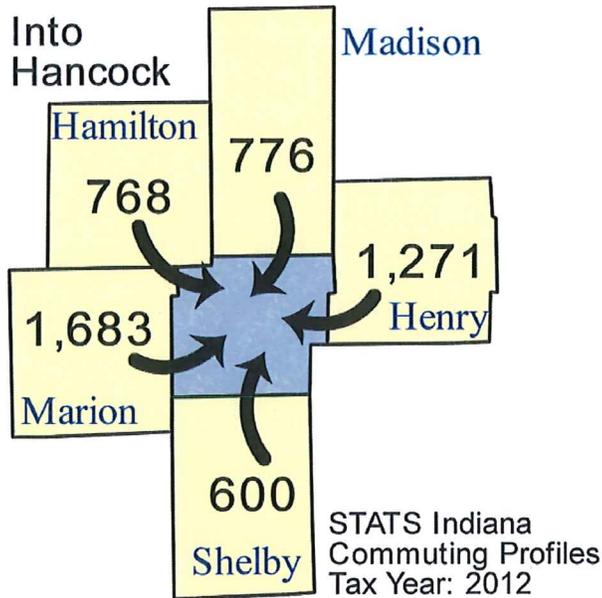


Figure 2-3 Workers Commuting into Hancock County

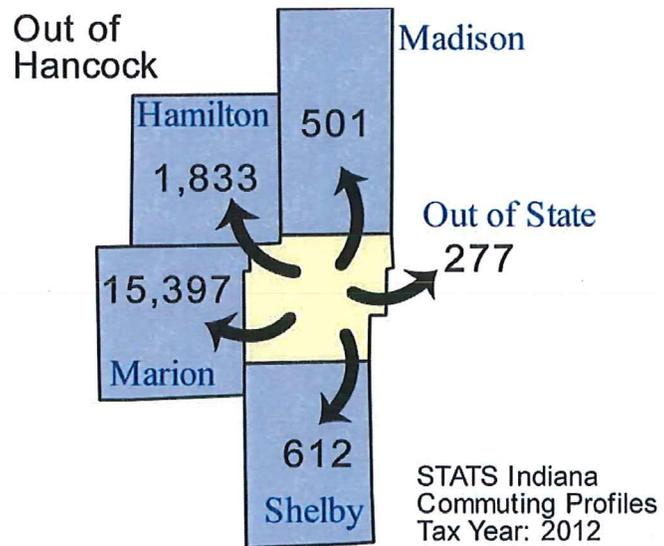


Figure 2-4 Workers Commuting out of Hancock County

## 2.4 CRITICAL AND NON-CRITICAL INFRASTRUCTURE

### REQUIREMENT §201.6(c)(2)(ii)(A):

*The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas...*

Critical facilities, or critical infrastructure, are the assets, systems, and networks, whether physical or virtual, so vital to the local governments and the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety, or any combination thereof.

These structures are vital to the community's ability to provide essential services and protect life and property, are critical to the community's response and recovery activities, and/or are the facilities the loss of which would have a severe economic or catastrophic impact. The operation of these facilities becomes especially important following a hazard event.

The Hancock County Surveyor's Office provided the listing and locations of the following 450 critical infrastructure points for the MHMP Update:

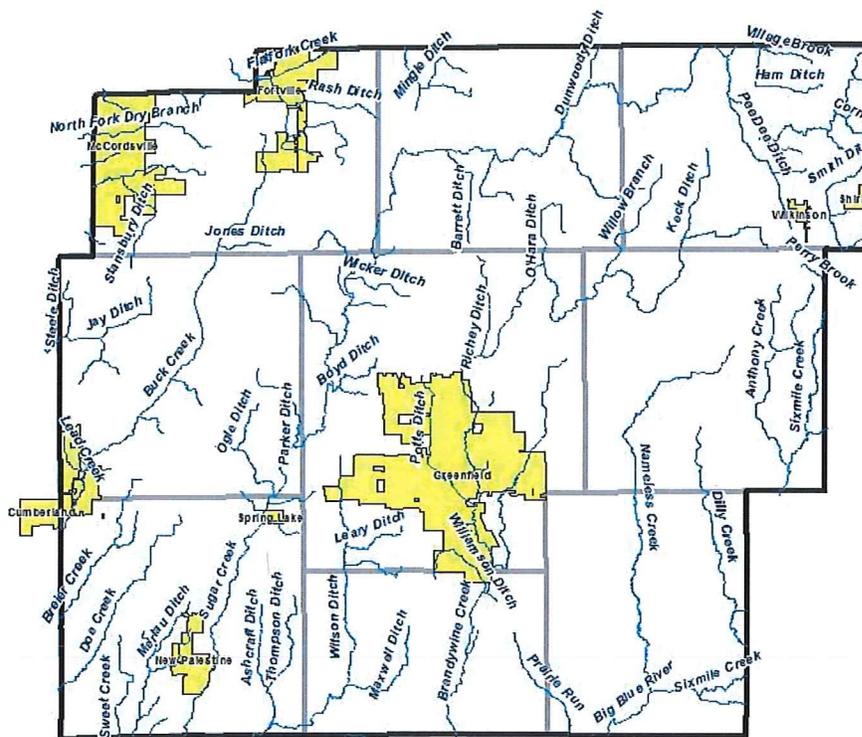
- 7 Agriculture and Food
- 17 Banking and Finance
- 76 Churches
- 42 Commercial
- 14 Critical Manufacturing
- 59 Communications
- 6 Dams
- 1 Defense Industrial Base
- 51 Daycare
- 49 Energy
- 16 Emergency Services
- 12 Government
- 48 Healthcare and Public Health
- 29 Schools
- 5 Transportation Facility
- 18 Water

Information provided by the Surveyor's Office, GIS Department, and the MHMP Planning Committee members was utilized to identify the types and locations of critical structures throughout Hancock County. Draft maps were provided to

the Planning Committee for their review and all comments were incorporated into the maps and associated databases.

**Exhibit 1** illustrates the critical infrastructure identified throughout Hancock County. **Appendix 4** lists the critical structures in Hancock County by NFIP Community. Non-critical structures include residential, industrial, commercial, and other structures not meeting the definition of a critical facility and are not required for a community to function. The development of this MHMP focused on critical structures; thus, non-critical structures are not mapped or listed.

**2.5 MAJOR WATERWAYS AND WATERSHEDS**



According to the United States Geological Survey (USGS) there are 90 waterways in Hancock County; they are listed in Appendix 5. The County's main waterways are the Big Blue River, Brandywine Creek, and Sugar Creek and the county lies within two 8-digit Hydrologic Unit Codes (HUC): the Upper White (05120201), and the Driftwood (05120204). These major waterways are identified on **Figure 2-5**.

Figure 2-5 Hancock County Waterways

## 2.6 NFIP PARTICIPATION

The NFIP is a FEMA program that enables property owners in participating communities to purchase insurance protection against losses from flooding. Hancock County, the Town of Cumberland, the Town of Fortville, the City of Greenfield, the Town of McCordsville, the Town of New Palestine, and the Town of Spring Lake are participants in the NFIP. Any smaller communities within Hancock County may also be provided coverage by the MHMP through the County’s program.

Since the development of the 2007 Hancock County MHMP, these communities continue to participate in the NFIP program. These NFIP communities have also adopted Flood Hazard Ordinances containing language regarding compensatory floodplain storage.

At the time of preparing this MHMP, Hancock County participate in the CRS program at a Class 8. The CRS program is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the 3 goals of the CRS: 1) reduce flood losses; 2) facilitate accurate insurance rating; and 3) promote education and awareness of flood insurance. For CRS participating communities, flood insurance premium rates are discounted in increments of 5% for each class level achieved. **Table 2-2** lists the NFIP number, effective map date, and the date each community joined the NFIP program.

**Table 2-2 NFIP Participation**

NFIP COMMUNITY	NFIP NUMBER	EFFECTIVE MAP DATE	JOIN DATE
Hancock County	180419	03-17-14	10-15-82
Town of Cumberland	180510	03-17-14	12-04-07
Town of Fortville	180372	03-17-14	12-04-07
City of Greenfield	180084	12-04-07	11-04-81
Town of McCordsville	180468	03-17-14	10-15-82
Town of New Palestine	180336	03-17-14	12-04-07
Town of Spring Lake	180346	04-03-84	12-04-07

(FEMA, 2015)

## 2.7 TOPOGRAPHY

Hancock County is bordered geographically to the east by Henry and Rush Counties, to the west by Marion County, to the North by Madison and Hamilton Counties, and to the south by Shelby County. The County’s landscape

consists primarily of flat or gently rolling terrain built from glacial outwash materials. Land elevation ranges from 1,030 feet at the highest point in the <sup>north</sup> southeastern portion of the county near Shirley to 780 feet at the lowest along Sugar Creek in the southwestern portion of the county.

## 2.8 CLIMATE

The Midwestern Regional Climate Center (MRCC) provided climate data that includes information retrieved from a weather station located in Greenfield, identified as station USCO0123527. The average annual precipitation is 45.81 inches per year, with the wettest month being July averaging 5.08 inches of precipitation and the driest month being February with an average of 2.42 inches of precipitation. The highest 1-day maximum precipitation was recorded in August of 1968 with 5.2 inches of rain. On average, there are 81.9 days of precipitation greater than or equal to 0.1 inches; 31.1 days with greater than or equal to 0.5 inches; and 10.9 days with greater than or equal to 1.0 inch of precipitation.

## CHAPTER 3

# RISK ASSESSMENT

### REQUIREMENT §201.6(c)(2):

*[The risk assessment shall provide the] factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessment must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

A risk assessment measures the potential loss from a hazard incident by assessing the vulnerability of buildings, infrastructure, and people in a community. It identifies the characteristics and potential consequences of hazards, how much of the community may be affected by a hazard, and the impact on community assets. The risk assessment conducted for Hancock County and the NFIP communities is based on the methodology described in the Local Multi-Hazard Mitigation Planning Guidance published by FEMA in 2008 and is incorporated into the following sections:

**Section 3.1: Hazard Identification** lists the natural, technological, and political hazards selected by the Planning Committee as having the greatest direct and indirect impact to the County as well as the system used to rank and prioritize the hazards.

**Section 3.2: Hazard Profile** for each hazard, discusses 1) historic data relevant to the County where applicable; 2) vulnerability in terms of number and types of structures, repetitive loss properties (flood only), estimation of potential losses, and impact based on an analysis of development trends; and 3) the relationship to other hazards identified by the Planning Committee.

**Section 3.3: Hazard Summary** provides an overview of the risk assessment process; a comparative hazard ranking with other methodologies used by Hancock County; a table summarizing the relationship of the hazards; and a composite map to illustrate areas impacted by the hazards.

## 3.1 HAZARD IDENTIFICATION

### 3.1.1 Hazard Selection

The MHMP Planning Committee reviewed the list of natural, technological, and political hazards from the 2007 Hancock County MHMP and discussed recent and the potential for future hazard events. The Committee identified those hazards that affected Hancock County and the NFIP communities and selected the hazards to study in detail as part of this planning effort. As shown in **Table**

3-1 these include: dam failure; drought; earthquake; extreme temperature; flooding; hailstorms, thunderstorms, and windstorms; hazardous materials incident; snow storms and ice storms; and tornado.

All hazards studied with the 2007 Hancock County MHMP are included in the update. Other hazards like those identified on the draft Hazard Identification and Risk Assessment (HIRA) tool being developed by IDHS were discussed but the Committee agreed that either these hazards were addressed in other documents or have little local impact and were therefore not studied in detail as a part of this planning effort.

**Table 3-1 Hazard Identification**

TYPE OF HAZARD	LIST OF HAZARDS	DETAILED STUDY	
		2007 MHMP	MHMP UPDATE
Natural	Drought	Yes	Yes
	Earthquake	Yes	Yes
	Extreme Temperature	Yes	Yes
	Flood	Yes	Yes
	Hail/Thunder/Wind	Yes	Yes
	Snow / Ice Storm	Yes	Yes
	Tornado	Yes	Yes
Technological	Dam Failure	Yes	Yes
	Hazardous Material Incident	Yes	Yes

**3.2 HAZARD RANKING**

The Planning Committee ranked the selected hazards in terms of importance and potential for disruption to the community using a modified version of the Calculated Priority Risk Index (CPRI). The CPRI, adapted from MitigationPlan.com, is a tool by which individual hazards are evaluated and ranked according to an indexing system. The CPRI value (as modified by CBBEL) can be obtained by assigning varying degrees of risk probability, magnitude/severity, warning time, and the duration of the incident for each event, and then calculating as index value based on a weighted scheme. For ease of communications, simple graphical scales are used.

**3.2.1 Probability**



Probability is defined as the likelihood of the hazard occurring over a given period. The probability can be specified in one of the following categories:

- Unlikely – incident is possible, but not probable, within the next 10 years (1)

- Possible – incident is probable within the next 5 years (2)
- Likely - incident is probable within the next 3 years (3)
- Highly Likely – incident is probable within the next calendar year (4)

3.2.2 Magnitude / Severity



Magnitude/severity is defined by the extent of the injuries, shutdown of critical infrastructure, the extent of property damage sustained, and the duration of the incident response. The magnitude can be specified in one of the following categories:

- Negligible – few injuries OR critical infrastructure shutdown for 24 hours or less OR less than 10% property damaged OR average response duration of less than 6 hours (1)
- Limited – few injuries OR critical infrastructure shut down for more than 1 week OR more than 10% property damaged OR average response duration of less than 1 day (2)
- Critical – multiple injuries OR critical infrastructure shut down of at least 2 weeks OR more than 25% property damaged OR average response duration of less than 1 week (3)
- Significant – multiple deaths OR critical infrastructure shut down of r1 1 month or more OR more than 50% property damaged OR average response duration of less than 1 month (4)

3.2.3 Warning Time



Warning time is defined as the length of time before the event occurs and can be specified in one of the following categories:

- More than 24 hours (1)
- 12-24 hours (2)
- 6-12 hours (3)
- Less than 6 hours (4)

3.2.4 Duration

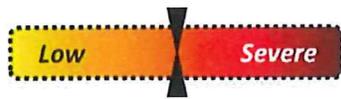


Duration is defined as the length of time that the actual event occurs. This does not include response or recovery efforts. The duration of the event can be specified in one of the following categories:

- Less than 6 hours (1)
- Less than 1 day (2)

- Less than 1 week (3)
- Greater than 1 week (4)

3.2.5 Calculating the CPRI



The following calculation illustrates how the index values are weighted and the CPRI value is calculated.  $CPRI = Probability \times 0.45 + Magnitude/Severity \times 0.30 + Warning\ Time \times 0.15 + Duration \times 0.10$ . For the purposes of this planning effort, the calculated risk is defined as:

- **Low** if the CPRI value is between 1 and 2
- **Elevated** if the CPRI value is between 2 and 3
- **Severe** if the CPRI value is between 3 and 4

The CPRI value provides a means to assess the impact of one hazard relative to other hazards within the community. A CPRI value for each hazard was determined for each NFIP community in Hancock County, and then a weighted CPRI value was computed based on the population size of each community. **Table 3-2** presents each community, population, and the weight applied to individual CPRI values to arrive at a combined value for the entire County. Weight was calculated based on the average percentage of each community’s population in relation to the total population of the County. Thus, the results reflect the relative population influence of each community on the overall priority rank.

**Table 3-2 Determination of Weighted Value for NFIP Communities**

NFIP COMMUNITY	POPULATION (2014)	% OF TOTAL POPULATION	WEIGHTED VALUE
Hancock County	36,157	50.2%	0.50
Town of Cumberland	2,702	3.8%	0.04
Town of Fortville	3,953	5.5%	0.05
City of Greenfield	21,398	29.7%	0.30
Town of McCordsville	5,445	7.6%	0.08
Town of New Palestine	2,105	2.9%	0.03
Town of Spring Lake	218	0.3%	0.00
<b>TOTAL</b>	<b>71,978</b>	<b>100.0%</b>	<b>1.00</b>

**3.3 HAZARD PROFILES**

The hazards studied for this report are not equally threatening to all communities throughout Hancock County. While it would be difficult to predict the probability of an earthquake or tornado affected a specific

community, it is much easier to predict where the most damage would occur in a known hazard area such as a floodplain or near a facility utilizing an Extremely Hazardous Substance (EHS). The magnitude and severity of the same hazard may cause varying levels of damages in different communities.

This section describes each of the hazards that were identified by the Planning Committee for detailed study as a part of this MHMP Update. The discussion is divided into the following subsections:

- **Hazard Overview** provides a general overview of the causes, effects, and characteristics that the hazard represents
- **Historic Data** presents the research gathered from local and national courses on the hazard extent and lists historic occurrences and probability of future incident occurrence
- **Assessing Vulnerability** describes, in general terms, the current exposure, or risk, to the community regarding potential losses to critical infrastructure and the implications to future land use decisions and anticipated development trends
- **Relationship to Other Hazards** explores the influence one hazard may have on another hazard.

## Natural Hazards



### 3.3.1 Drought

#### Drought: Overview

Drought, in general, means a moisture deficit extensive enough to have social, environmental, or economic effects. Drought is not a rare and random climate incident; rather, it is a normal, naturally recurring feature of climate. Drought may occur in virtually all climactic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration and is different from aridity, which is restricted to low rainfall regions.

There are four academic approaches to examining droughts; these are meteorological, hydrological, agricultural, and socio-economic. Meteorological drought is based on the degree, or measure, of dryness compared to a normal, or average amount of dryness, and the duration of the dry period. Hydrological



*Figure 3-1 Drought Affected Soil*

drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply. Agricultural drought is related to agricultural impacts; focusing on precipitation shortages, differences between actual and potential evapo-transpiration, soil water deficits, reduced ground water or reservoir levels, and crop yields. Socioeconomic drought relates the lack of moisture to community functions in the full range of societal functions, including power generation, the local economy, and food sources. **Figure 3-1** shows soil affected by drought conditions.

#### Drought: Recent Occurrences

Data gathered from the U.S. Drought Monitor indicated that between October 2007 and April 2016, there were 32 weeks where some portion of Hancock County was considered to be in a “Severe Drought”, 15 weeks in an “Extreme Drought”, and 1 week in an “Exceptional Drought”. **Figure 3-2**, from the U.S. Drought Monitor, describes the rationale to classify the severity of droughts. Those weeks of Extreme and Exceptional Drought are all associated with the summer 2012 event.

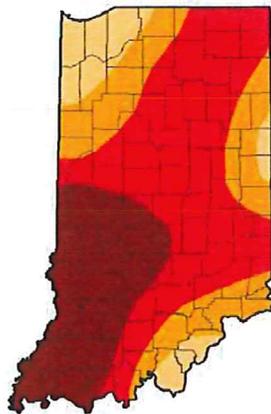
Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> <li>Going into drought:                             <ul style="list-style-type: none"> <li>short-term dryness slowing planting, growth of crops or pastures</li> </ul> </li> <li>Coming out of drought:                             <ul style="list-style-type: none"> <li>some lingering water deficits</li> <li>pastures or crops not fully recovered</li> </ul> </li> </ul>
D1	Moderate Drought	<ul style="list-style-type: none"> <li>Some damage to crops, pastures</li> <li>Streams, reservoirs, or wells low, some water shortages developing or imminent</li> <li>Voluntary water-use restrictions requested</li> </ul>
D2	Severe Drought	<ul style="list-style-type: none"> <li>Crop or pasture losses likely</li> <li>Water shortages common</li> <li>Water restrictions imposed</li> </ul>
D3	Extreme Drought	<ul style="list-style-type: none"> <li>Major crop/pasture losses</li> <li>Widespread water shortages or restrictions</li> </ul>
D4	Exceptional Drought	<ul style="list-style-type: none"> <li>Exceptional and widespread crop/pasture losses</li> <li>Shortages of water in reservoirs, streams, and wells creating water emergencies</li> </ul>

Figure 3-2 US Drought Monitor Drought Severity Classification

In July and August 2012, nearly 100% of Indiana was experiencing drought conditions ranging from “D0-Abnormally Dry” to “D4-Exceptional Drought”. **Figure 3-3** identifies those areas and categories of drought throughout Indiana for August 7, 2012. Hancock County is primarily located in the “D3-Extreme” zone. D3 includes the potential impacts of major crop and pasture losses and widespread water shortages and restrictions. D4 includes exceptional and widespread crop or pasture losses are likely and shortages of water in reservoirs, streams and wells creating water emergencies. The September 4, 2012 report shows all of Hancock County within the “D2-Severe Drought” consideration. It wasn’t until the October 30, 2012 report that the entire county was considered out of drought condition status.

No property or crop losses have been documented in Hancock County specific to the 6 events listed by the National Climate Data Center (NCDC) between October 2007 and January 2016. Four of these events were related to the 2012 drought. One narrative regarding the October 2010 event indicated that a countywide burn ban was in effect. Narratives throughout the 2012 event reported severely dry weather, burn bans, and record low rainfall amounts.

U.S. Drought Monitor  
Indiana



August 7, 2012  
(Released Thursday, Aug. 9, 2012)  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	Total	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	89.75	66.56	25.00
Last Week 10/12/12	0.00	100.00	66.69	64.65	66.04	24.24
3 Month Ago 6/12/12	88.34	11.66	0.00	0.00	0.00	0.00
Start of Calendar Year 1/1/12	100.00	0.00	0.00	0.00	0.00	0.00
Start of Vintner Year 10/1/11	50.11	44.89	6.08	0.00	0.00	0.00
One Year Ago 8/1/11	25.54	73.05	30.35	0.00	0.00	0.00

Intensity  
 D0 Abnormally Dry      D3 Extreme Drought  
 D1 Moderate Drought    D4 Exceptional Drought  
 D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:  
Mark Svoboda  
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

Figure 3-3 August 2012 Indiana Drought Map

duration will be greater than 1 week. A summary is shown in **Table 3-3**.

**Table 3-3 CPRI for Drought**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Likely	Critical	> 24 Hours	> 1 Week	Elevated
City of Cumberland	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of Fortville	Likely	Limited	> 24 Hours	> 1 Week	Elevated
City of Greenfield	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of McCordsville	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of New Palestine	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of Spring Lake	Likely	Limited	> 24 Hours	> 1 Week	Elevated

According to the National Drought Mitigation Center, scientists have difficulty predicting droughts more than 1 month in advance due to the numerous variables such as precipitation, temperature, soil moisture, topography, and air-sea interactions. Further anomalies may also enter the equation and create more dramatic droughts, or lessen the severity of droughts. Based on the previous occurrences of droughts and drought related impacts felt within Hancock County, the Committee estimated that the probability of a drought occurring in the area is “Likely”; or occurrence is probable within the next 3 years.

Drought: Assessing Vulnerability

This type of hazard will generally affect entire counties and even multi-county regions at one time. Within Hancock County, direct and indirect effects from a long period of drought may include:

**Direct Effects:**

- Urban and developed areas may experience revenue losses from landscaping companies, golf courses, restrictions on industry cooling and processing demands, businesses dependent on crop yields; and increased potential for fires.
- Rural areas within the County may experience revenue losses from reductions in livestock and crop yields as well as increased field fires.
- Citizens served by drinking water wells may be impacted during low water periods and may require drilling of deeper wells or loss of water service for a period of time.

**Indirect Effects:**

- Loss of income of employees from businesses and industry affected; loss of revenue to support services (food service, suppliers, etc.)
- Loss of revenue from recreational or tourism sectors associated with reservoirs, streams, and other open water venues.

- Lower yields from domestic gardens increasing the demand on purchasing produce and increased domestic water usage for landscaping
- Increased demand on emergency responders and firefighting resources

#### *Estimating Potential Losses*

It is difficult to estimate the potential losses associated with a drought for Hancock County because of the nature and complexity of this hazard and the limited data on past occurrences. However, for the purpose of this MHMP Update, a scenario was used to estimate the potential crop loss and associated revenue lost due to a drought similar to that experienced during the drought of record from 1988. In 2015, Hancock County produced approximately 9.7M bushels of corn and 3.5M bushels of soybeans, as reported by the United States Department of Agriculture (USDA) National Agricultural Statistics Service. Using national averages of \$3.85 per bushel of corn and \$8.85 per bushel of soybeans, the estimated crop receipts for 2015 would be \$68.3M. Using the range of crop yield decreases reported in 1988 and 1989, just after the 1988 drought period (50%-86%) and assuming a typical year, economic losses could range between \$34.0M-\$58.7M; depending on the crop produced and the market demand. Effects of drought on corn crops can be seen in **Figure 3-4**.



**Figure 3-4 Crops Affected by Drought**

*Purdue Agriculture News* reports that as of March 2013, Indiana producers received more than \$1.0B in crop insurance payments for 2012 corn, soybean, and wheat losses. This amount is nearly double that of the previous record, \$522M following 2008 losses, also due to drought.

According to a July 5, 2012 article in *The Times* (Noblesville, IN), "The effects of drought also could touch agricultural businesses, such as handlers and processors, equipment dealers, and see, fertilizer and pesticide providers". Further, "...consumers are likely to see an increase in food prices of 2.5 percent to 3.5 percent into 2013".

Additional losses associated with a prolonged drought are more difficult to quantify. Drought has lasting impacts on urban trees: death to all or portions of a tree, reduction in the tree's ability to withstand insects and diseases, and interruption of normal growth patterns. Such effects on trees, especially urban trees can lead to additional impacts, both environmentally and monetarily in terms of the spread of Emerald Ash Borer insect and the weakening of tree limbs and trunks which may lead to increased damages during other hazard events such as wind and ice storms.

#### *Future Considerations*

Advancements in plant hybrids and development have eased the impacts from short-lived droughts. Seeds and plants may be more tolerant of dryer seasons and therefore fewer crop losses may be experienced.

As the more urban areas of the county continue to grow and expand, protocols may need to be developed which create a consistency throughout the communities and the unincorporated portions of the county for burn bans and water usage advisories.

#### Drought: Relationship to Other Hazards

A drought will not be caused by any other hazard studied during this planning effort. However, it is anticipated that areas of the county may be more susceptible to fires during a drought and this may lead to increased losses associated with a structural fire.

3.3.2 Earthquake



Earthquake Overview

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 the 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 the plates.

Ground shaking from 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 move off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

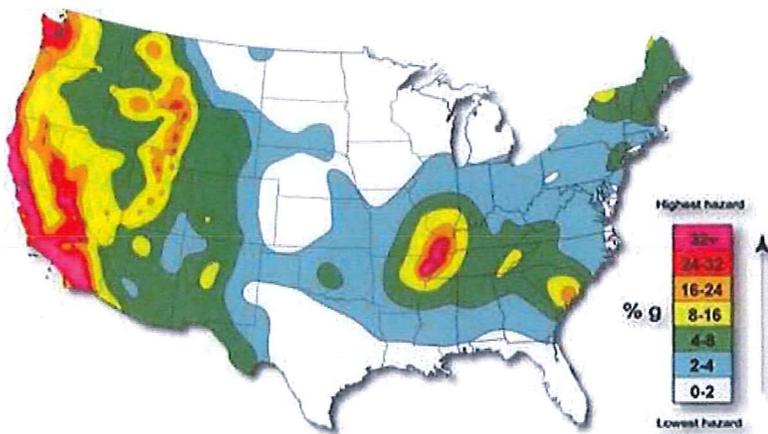


Figure 3-5 Earthquake Hazard Areas in the US

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70-75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States approach \$200B. Scientists are currently studying the New Madrid fault area and have predicted that the chances of an earthquake in the M8.0 range occurring within the next 50 years

are approximately 7%-10%. However, the chances of an earthquake at a M6.0 or greater, are at 90% within the next 50 years.

There are 45 states and territories in the United States at moderate to very high risk from earthquake, and they are located in every region of the country (Figure 3-5). California experiences the most frequent damaging earthquakes;

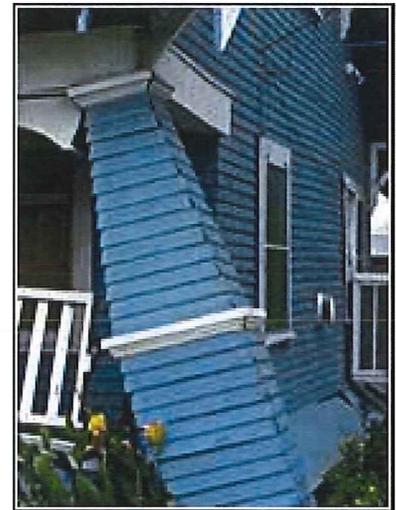
however, Alaska experiences the greatest number of large earthquakes-most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 occurred over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

#### Earthquake: Recent Occurrences

Indiana, as well as several other Midwestern states, lies in the most seismically active region east of the Rocky Mountains. The county is located just outside the anticipated impact area for the New Madrid Seismic Zone and eastern Hancock lies within the Fort Wayne Rift Zone. In addition, a high angle fault is located in the northwestern corner of Hancock County, just west of Fortville.

On April 18, 2008, an M5.2 quake, reported by the Central United States Earthquake Consortium, struck southeast Illinois in Wabash County and included reports of strong shaking in southwestern Indiana, Kansas, Georgia, and the upper peninsula of Michigan. With over 25,000 reports of feeling the earthquake, there were no reports of injuries or fatalities caused by the event.

On December 30, 2010, central Indiana experienced an earthquake with a magnitude of 3.8; rare for this area in Indiana as it is only the 3<sup>rd</sup> earthquake of notable size to occur north of Indianapolis. Even rarer is the fact that scientists believe that the quake was centered in Greentown, Indiana approximately 13 miles southeast of Kokomo, Indiana. According to *The Kokomo Tribune*, "113 people called 911 in a 15-minute period after the quake, which was the first tremblor centered in Indiana since 2004". Further, a geophysicist from the USGS in Colorado stated, "It was considered a minor earthquake", and "Maybe some things would be knocked off shelves, but as far as some significant damage, you probably wouldn't expect it from a 3.8".



*Figure 3-6 Earthquake Damaged Porch*

Most recently, an M5.8 centered in Mineral, Virginia affected much of the East Coast on August 23, 2011. According to USA Today, 10 nuclear power plants were shutdown of precautionary inspections following the quake, over 400

flights were delayed, and the Washington Monument was closed indefinitely pending detailed inspections by engineers.

Based on historical earthquake data, local knowledge of previous earthquakes, and the results of a HAZUS-MH scenario, the Committee determined that the probability of an earthquake occurring in Hancock County or any of the communities is “Unlikely”. Should an earthquake occur, the impacts associated with this hazard are anticipated to be “Critical” within all areas of the County.

As with all earthquakes, it was determined that the residents of Hancock County would have little to no warning time (less than 6 hours) and that the duration of the event would be expected to be less than 1 week. A summary is shown in **Table 3-4**.

**Table 3-4 CPRI for Earthquake**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
Town of Cumberland	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
Town of Fortville	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
City of Greenfield	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
Town of McCordsville	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
Town of New Palestine	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated
Town of Spring Lake	Unlikely	Critical	< 6 Hours	< 1 Week	Elevated

According to the Ohio Department of Natural Resources Division of Geological Survey, “...it is difficult to predict the maximum-size earthquake that could occur in the state and certainly impossible to predict when such an event would occur. In part, the size of an earthquake is a function of the area of a fault available for rupture. However, because all known earthquake-generating faults in Ohio are concealed beneath several thousand feet of Paleozoic sedimentary rock, it is difficult to directly determine the size of these faults.” Further according to the Indiana Geological Survey, “...no one can say with any certainty when or if an earthquake strong enough to cause significant property damage, injury, or loss of life in Indiana will occur...we do indeed face the possibility of experiencing the potentially devastating effects of a major earthquake at some point in the future”. The Committee felt that an earthquake occurring within or near to Hancock County is “Unlikely” to occur within the next 10 years.

Earthquake: Assessing Vulnerability

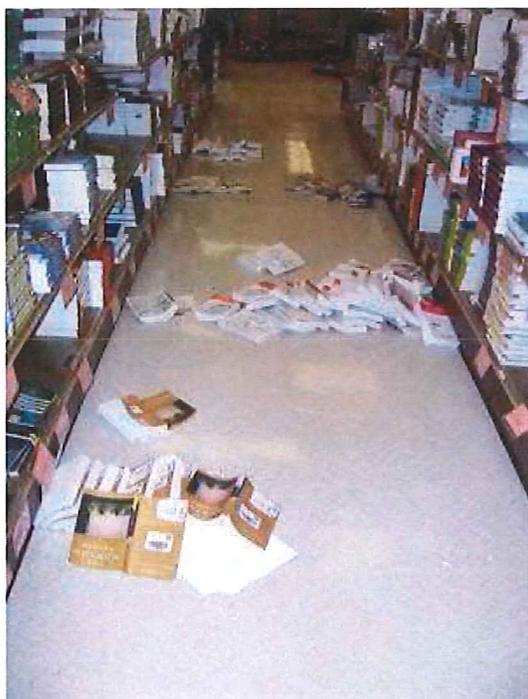
Earthquakes generally affect broad areas and potentially many counties at one time. Within Hancock County, direct and indirect effects from an earthquake may include:

**Direct Effects:**

- Urban areas may experience more damages due to the number of structures and critical infrastructure located in these areas
- Rural areas may experience losses associated with agricultural structures such as barns and silos
- Bridges, buried utilities, and other infrastructure may be affected throughout the County and municipalities

**Indirect Effects:**

- Provide emergency response personnel to assist in the areas with more damage
- Provide shelter for residents of areas with more damage
- Delays in delivery of goods or services originating from areas more affected by the earthquake



*Figure 3-7 Minor Earthquake Damages*

Types of loss caused by an earthquake could be physical, economic, or social in nature. Due to the unpredictability and broad impact regions associated with an earthquake, all critical and non-critical infrastructure are at risk of experiencing earthquake related damages. Damages to structures, infrastructure, and even business interruptions can be expected following an earthquake. Examples of varying degrees of damages are shown in **Figure 3-6** and **Figure 3-7**.

*Estimating Potential Losses*

In order to determine the losses associated with an earthquake, the HAZUS-MH software was utilized to determine the impact anticipated from a moderate earthquake with an epicenter along the Fortville Fault.

According to the HAZUS-MH scenario, total economic loss associated with this earthquake is anticipated to be near \$100K. The HAZUS-MH model computes anticipated economic losses for the hypothetical earthquake due to

direct building losses and business interruption losses. Direct building losses are the costs to repair or to replace the damage caused to the building and

contents, while the interruption losses are associated with the inability to operate a business due to the damage sustained. Business interruption losses also include the temporary living expenses for those people displaced from their homes.

The HAZUS-MH Earthquake Model allows local building data to be imported into the analysis. However, these local data are imported as “general building stock”, meaning that the points are assigned to a census tract rather than a specific XY coordinate. HAZUS performs the damage analysis as a county wide analysis and reports losses by census tract. In addition to importing local building data, the Hancock County model was further enhanced by adding localized parameters (i.e., shake maps, liquefaction, soils). While the results of the hypothetical scenario appear to be plausible, care should be taken when interpreting these results.

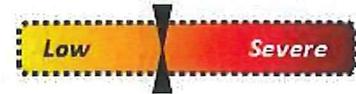
#### *Future Considerations*

While the occurrence of an earthquake in or near to Hancock County may not be the highest priority hazard studied for the development of the Plan, it is possible that residents, business owners, and visitors may be affected should an earthquake occur. For that reason, Hancock County should continue to provide education and outreach regarding earthquakes and even earthquake insurance along with education and outreach for other hazards. As Hancock County and the communities within the County continue to grow and develop, the proper considerations for the potential of an earthquake to occur may help to mitigate against social, physical, or economic losses in the future.

#### Earthquake: Relationship to Other Hazards

Hazardous materials incidents may occur as a result of damage to material storage containers or transportation vehicles involved in road crashes or train derailments. Further, dam failures may occur following an earthquake or associated aftershocks due to the shifting of the soils in these hazard areas. These types of related hazards may have greater impacts on Hancock County communities than the earthquake itself. It is not expected that earthquakes will be caused by other hazards studied within this plan.

3.3.3 Extreme Temperature



Extreme Temperatures: Overview

Extreme heat is defined as a temporary elevation of average daily temperatures that hover 10 degrees or more above the average high temperature for the region for the duration of several weeks. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a dome of high atmospheric pressure traps water-laden air near the ground. In a normal year, approximately 175 Americans die from extreme heat.

According to the NWS, “The Heat Index or the “Apparent Temperature” is an accurate measure of how hot it really feels when the Relative Humidity is added to the actual air temperature”. To find the Heat Index Temperature, refer to the Heat Index Chart in **Figure 3-8**. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index – how hot it feels – is 121°F. The Weather Service will initiate alert procedures when the

Heat Index is expected to exceed 105°-110°F for at least 2 consecutive days.

**NOAA's National Weather Service**

**Heat Index  
Temperature (°F)**

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	118	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

**Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity**

- Caution
- Extreme Caution
- Danger
- External Danger

Figure 3-8 Heat Index Chart

It is important to also note that these heat index values were devised for shady, light wind conditions. Exposure to full sunshine may increase heat index values by up to 15°F. Further, strong winds, particularly with very hot, dry air, can also be extremely hazardous.

As Figure 3-7 indicates, there are 4 cautionary categories associated with varying heat index temperatures.

- Caution: 80°-90°F: Fatigue is possible with prolonged exposure and physical activity
- Extreme Caution: 90°-95°F: Sunstroke, heat cramps, heat exhaustion may occur with prolonged physical activity
- Danger: 105°-130°F: Sunstroke, heat cramps, or heat exhaustion is likely
- Extreme Danger: >130°F: Heatstroke is imminent

Extreme cold is defined as a temporary, yet sustained, period of extremely low temperatures. Extremely low temperatures can occur in winter months when continental surface temperatures are at their lowest point and the North American Jet Stream pulls arctic air down into the continental United States. The jet stream is a current of fast moving air found in the upper levels of the atmosphere. This rapid current is typically thousands of kilometers long, a few hundred kilometers wide, and only a few kilometers thick. Jet streams are usually found somewhere between 10-15 km (6-9 miles) above the Earth’s surface. The position of this upper-level jet stream denotes the location of the strongest surface temperature contrast over the continent. The jet stream winds are strongest during the winter months when continental temperature extremes are greatest. When the jet stream pulls arctic cold air masses over portions of the United States, temperatures can drop below 0° F for 1 week or more. Sustained extreme cold poses a physical danger to all individuals in a community and can affect infrastructure function as well.

### Wind chill is a guide to winter danger

**New wind chill chart**  
 Frostbite occurs in 15 minutes or less

Wind (MPH)	Temperature (°F)											
	30	25	20	15	10	5	0	-5	-10	-15	-10	-25
5	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
10	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
15	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
20	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
25	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
30	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
35	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
40	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
45	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65
50	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67
55	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68
60	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69

Figure 3-9 NWS Wind Chill Chart

In addition to strictly cold temperatures, the wind chill temperature must also be considered when planning for extreme temperatures. The wind chill temperature, according to the NWS, is how cold people and animals feel when outside and it is based on the rate of heat loss from exposed skin. **Figure 3-9** identifies the Wind Chill Chart and how the same ambient temperature may feel vastly different in varying wind speeds.

### Extreme Temperature: Recent Occurrences

The effects of extreme temperatures extend across large regions, typically affecting several counties, or states, during a single event. According to the NCDC, there have been 0 reported occurrences of extreme heat or extreme cold between October 2007 and January 2016. Local media outlets have provided information related to extreme temperatures occurring since the last planning effort.

In July 2012, the RTV6 *TheIndyChannel.com* reported that “The average high temperature in Indianapolis from June 28 to July 6 was a little more than 100 degrees, and Friday’s high temperature of 105 was the hottest since 1936, just

one degree shy of the all-time highest temperature in Indianapolis since records began in 1871”. Further, the article highlighted the average temperature for the 10-day period was nearly 101 degrees. The record 10-day average high temperature of 103 degrees was set in 1936.

January 2009 brought a string of cold weather that caused school delays, emergency response delays, and several cold weather advisories. Cold weather also slowed emergency response as firefighters were delayed by slick roads, frozen hydrants, and hazards caused by water used to battle the blaze.

More recently, in January 2013 several schools delayed the start of the school day as overnight and early morning temperatures with wind chill adjustments felt like -20°. Wind chill advisories were issued through Central Indiana, residents were urged to learn the warning signs of frostbite, take special precautions for pets, and dress in many warm layers.

It is difficult to predict the probability that an extreme temperature event will affect Hancock County residents within any given year. However, based on historic knowledge and information provided by the NFIP representatives, an extreme temperature event is “Likely” (possible within the next 3 years) to occur and if an event did occur, it would result in “Negligible” to “Limited” magnitude. **Table 3-5** identifies the CPRI for extreme temperature events for all NFIP communities in Hancock County.

**Table 3-5 CPRI for Extreme Temperatures**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of Cumberland	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of Fortville	Likely	Limited	> 24 Hours	> 1 Week	Elevated
City of Greenfield	Likely	Negligible	> 24 Hours	> 1 Week	Elevated
Town of McCordsville	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of New Palestine	Likely	Limited	> 24 Hours	> 1 Week	Elevated
Town of Spring Lake	Likely	Limited	> 24 Hours	> 1 Week	Elevated

As shown in the table, index values remain identical throughout each NFIP community due to the regional extent and diffuse severity of this hazard event. Based on discussion within the Planning Committee, representatives from the City of Greenfield felt the magnitude of extreme temperatures would be negligible overall due to preparations and overall availability of temporary relief areas.

Extreme Temperatures: Assessing Vulnerability

As noted above, this type of hazard will generally affect entire counties and even multi-county regions at one time; however, certain portions of the population may be more vulnerable to extreme temperatures. For example, outdoor laborers, very young and very old populations, low income populations, and those in poor physical condition are at an increased risk to be impacted during these conditions.

By assessing the demographics of Hancock County, a better understanding of the relative risk that extreme temperatures may pose to certain populations can be gained. In total, nearly 15% of the County’s population is over 65 years of age, more than 6% of the population is below the age of 5, and approximately 5.4% of the population is considered to be living below the poverty line. People within these demographic categories are more susceptible to social or health related impacts associated with extreme heat.

<b>With Prolonged Exposure and/or Physical Activity</b>	
<b>Extreme Danger</b>	Heat stroke or sunstroke highly likely
<b>Danger</b>	Sunstroke, muscle cramps, and/or heat exhaustion likely
<b>Extreme Caution</b>	Sunstroke, muscle cramps, and/or heat exhaustion possible
<b>Caution</b>	Fatigue possible

*Figure 3-10 Danger Levels with Prolonged Heat Exposure*

Extreme heat can affect the proper function of organ and brain systems by elevating core body temperatures above normal levels.

Elevated core body temperatures, usually in excess of 104°F are often exhibited as heat stroke. For weaker individuals, an overheated core body temperature places additional stress on the body, and without proper hydration, the normal mechanisms for dealing with heat, such as sweating in order to cool down, are ineffective. Examples of danger levels associated with prolonged heat exposure are identified in **Figure 3-10**.

Extreme cold may result in similar situations as body functions are impacted as the temperature of the body is reduced. Prolonged exposure to cold may result in hypothermia, frostbite, and even death if the body is not warmed.

Within Hancock County, direct and indirect effects from a long period of extreme temperature may include:

**Direct Effects:**

- Direct effects are primarily associated with health risks to the elderly, infants, people with chronic medical disorders, lower income families, outdoor workers, and athletes.

**Indirect Effects:**

- Increased need for cooling or warming shelters
- Increased medical emergency response efforts
- Increased energy demands for heating or cooling

*Estimating Potential Losses*

It is difficult to estimate the potential losses due to extreme temperatures as damages are not typically associated with buildings but instead, with populations and persons.

This hazard is not typically as damaging to structures or critical infrastructure as it is to populations so monetary damages associated with the direct effects of the extreme temperature are not possible to estimate. Indirect effects would cause increased expenses to facilities such as healthcare or emergency services, manufacturing facilities where temperatures are normally elevated may need to alter work hours or experience loss of revenue if forced to limit production during the heat of the day, and energy suppliers may experience demand peaks during the hottest and/or coldest portions of the day.

*Future Considerations*

As more and more citizens are experiencing economic difficulties, local power suppliers along with charitable organizations have implemented programs to provide cooling and heating mechanisms to residents in need. Often, these programs are donation driven and the need for such assistance must be demonstrated. As susceptible populations increase or as local economies are stressed, such programs may become more necessary to protect Hancock County's at risk populations.

Extreme Temperatures: Relationship to Other Hazards

While extreme temperatures may be extremely burdensome on the power supplies in Hancock County, the Committee concluded that this type of hazard is not expected to cause any hazards studied, with the exception of a potential civil disturbance. It is anticipated that due to prolonged extreme temperatures, primarily long periods of high temperatures, citizens may become increasingly agitated and irritable and this may lead to a disturbance requiring emergency responder intervention.

### 3.3.4 Flood



#### Flood: Overview

Floods are the most common and widespread of all natural disasters. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow melts. A flood, as defined by the NFIP, is a general and temporary condition of partial or complete inundation or 2 or more acres of normally dry land area or of 2 or more properties from overflow of inland or tidal waters and unusual and rapid accumulation or runoff of surface waters from any sources, or a mudflow. Floods can be slow or fast rising but generally develop over a period of days.

Flooding and associated flood damages is most likely to occur during the spring because of heavy rains combined with melting snow. However, provided the right saturated conditions, intense rainfall of short duration during summer rainstorms are capable of producing damaging flash flood conditions.

The traditional benchmark for riverine or coastal flooding is a 1% annual chance of flooding, or the 100-year flood. This is a benchmark used by FEMA to establish a standard of flood protection in communities throughout the country. The 1% annual chance flood is referred to as the “regulatory” or “base” flood. Another term commonly used, the “100-year flood”, is often incorrectly used and can be misleading. It does not mean that only 1 flood of that size will occur every 100 years. What it actually means is that there is a 1% chance of a flood of that intensity and elevation happening in any given year. In other words, the regulatory flood elevation has a 1% chance of being equaled, or exceeded, in any given year and it could occur more than once in a relatively short time period.

#### Flood: Recent Occurrences

The NCDC reports that between October 2007 and January 2016, there were 6 flood events (4 floods and 2 flash floods) that resulted in approximately \$3.01M in property damages and an additional \$0.5K in crop damages. NCDC indicates that during the December 22, 2013 event, flooding resulted in the evacuation of several homes along SR 9 and 4<sup>th</sup> Street due to high water. Reports for other events also indicated water coming across the roads and localized flooding in areas such as Mohawk, Greenfield, and New Palestine.

**Appendix 6** provides the NCDC information regarding flood events that have resulted in injuries, deaths, or monetary damages to property and/or crops.

Stream gages are utilized to monitor surface water elevations and/or discharges at key locations and time periods. Some such gages are further equipped with NWS' Advanced Hydrologic Prediction Service (AHPS) capabilities. These gages have the potential to provide valuable information regarding historical high and low water stages, hydrographs representing current and forecasted stages, and a map of the surrounding areas likely to be flooded. Within Hancock County, there is one active USGS stream gage equipped with AHPS capabilities; identified on **Exhibit 2**.

Any property having received two insurance claim payments for flood damages totaling at least \$1,000, paid by the NFIP within any 10-year period since 1978 is defined as a repetitive loss property. These properties are important to the NFIP because they account for approximately 1/3 of the country's flood insurance payments. According to FEMA Region V, there are four properties within the unincorporated area of Hancock County and nine within the City of Greenfield considered to be repetitive loss property.

There have been a number of claims made for damages associated with flooding in Hancock County. Within the City of Greenfield, there have been 56 paid losses resulting in approximately \$830K in payments. Further, within the unincorporated areas of the County, there were 44 payments totaling approximately \$350K. **Table 3-6** identifies the number of claims per NFIP community as well as payments made.

**Table 3-6 Repetitive Loss Properties, Claims, and Payments**

NFIP COMMUNITY	# OF REPETITIVE LOSS PROPERTIES	CLAIMS SINCE 1978	\$ \$ PAID
Hancock County	4	44	\$350K
Cumberland	0	0	\$0
Fortville	0	0	\$830K
Greenfield	9	56	\$0
McCordsville	0	0	\$0
New Palestine	0	0	\$0
Spring Lake	0	0	\$0
<b>TOTAL</b>	<b>13</b>	<b>19</b>	<b>\$1.2M</b>

(IDNR, 2015)

(FEMA Region V, 2015)

Mandatory flood insurance purchase requirements apply to structures in 1% annual chance of flooding delineated areas. Total flood insurance premiums for Hancock County and the NFIP communities is approximately \$290K. Total flood insurance coverage for Hancock County is nearly \$57.2M. **Table 3-7** further indicates the premiums and coverage totals for individual NFIP communities.

**Table 3-7 Insurance Premiums and Coverage**

NFIP COMMUNITY	FLOOD INSURANCE PREMIUMS	FLOOD INSURANCE COVERAGE
Hancock County	\$152K	\$6.5M
Cumberland	\$3K	\$0.8M
Fortville	\$2K	\$0.6M
Greenfield	\$125K	\$0
McCordsville	\$4K	\$2.2M
New Palestine	\$3K	\$0
Spring Lake		
<b>TOTAL</b>	<b>\$290K</b>	<b>\$57M</b>

(IDNR, 2015)

As determined by the Committee, the probability of a flood occurring throughout Hancock County is “Highly Likely” in all communities. Impacts from such an event are anticipated to be “Limited”. The Committee also determined that the warning time would be short (< 6 hours) based on the limited number of warning measures, and that the duration of such an event is anticipated to last less than 1 week for all areas. A summary is shown in **Table 3-8**.

**Table 3-8 CPRI for Flood**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
Town of Cumberland	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
Town of Fortville	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
City of Greenfield	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
Town of McCordsville	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
Town of New Palestine	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe
Town of Spring Lake	Highly Likely	Limited	< 6 Hours	< 1 Week	Severe

As mentioned within this section, there is a 1% chance each year that the regulatory flood elevation will be equaled or exceeded and these types of events may occur more than once throughout each year. Further, based on information provided by the USGS/NWS stream gages, the NCDC, and previous experiences, the Committee determined that flooding is “Highly Likely” throughout the county.

Flood: Assessing Vulnerability

Flood events may affect large portions of Hancock County at one time as large river systems and areas with poor drainage cover much of the county and several communities. Within Hancock County, direct and indirect effects of a flood event may include:

**Direct Effects:**

- Structural and content damages and/or loss of revenue for properties affected by increased water
- Increased costs associated with additional response personnel, evacuations, and sheltering needs

**Indirect Effects:**

- Increased response times for emergency personnel if roads are impassable
- Increased costs associated with personnel to carry out evacuations in needed areas
- Increased risk of explosions and other hazards associated with floating propane tanks or other debris
- Losses associated with missed work or school due to closures or recovery activities
- Cancellations of special events in impacted areas or water related activities that become too dangerous due to high water

*Estimating Potential Losses*

**Figure 3-11** Car Submerged on Flooded Street

Critical and non-critical structures located in regulated floodplains, poorly drained areas, or low lying areas (**Figure 3-11**) are most at risk for damages associated with flooding. For this planning effort, a GIS Desktop Analysis methodology was utilized to estimate flood damages.

For the GIS Desktop Analysis method, an analysis was completed utilizing the effective Digital FIRMs (DFIRMs) overlaid upon the Modified Building Inventory provided by Hancock County and structures located within each flood zone were tallied using GIS

analysis techniques.

The Modified Building Inventory was created in ESRI ArcGIS by converting parcels to centroids, and joining Assessor Data to these centroids. Assessor data included square footage for the structure, and any structure that was listed as less than 400 ft<sup>2</sup> in area or was classified in the Assessor's database as a non-habitable structure was assumed to be an outbuilding. Also, buildings with an assessed value of \$0.00 or buildings that did not match the Assessor Data (parcel numbers did not match) were excluded from the analysis. Replacement values were calculated using:

$$\text{Residential} = \text{Assessed Value} \times 0.5$$

- Commercial = Assessed Value x 1.0
- Industrial = Assessed Value x 1.5
- Agricultural = Assessed Value x 1.0
- Education = Assessed Value x 1.0
- Government = Assessed Value x 1.0
- Religious = Assessed Value x 1.0

The resulting Modified Building Inventory was used in the GIS analyses.

In order to estimate anticipated damages associated with each flood in Hancock County and NFIP communities, it was estimated that 25% of structures in the flood zones would be destroyed, 35% of structures would be 50% damaged, and 40% of structures would be 25% damaged. **Table 3-9** identifies the estimated losses associated with structures in the floodway, the 100-year floodplain, and the 500-year floodplain areas by NFIP community within Hancock County.

**Table 3-9 Manual GIS Analysis Utilizing Most Recent Preliminary DFIRM Data and Hancock County Building Inventory**

	FLOODWAY		1%		0.2%		UNNUMBERED	
	#	\$	#	\$	#	\$	#	\$
Hancock County	117	\$18.1M	185	\$14.9M	117	\$9.5M	244	\$26.5M
Cumberland	0	0	2	\$0.1M	0	0	0	0
Fortville	2	\$0.1M	7	\$0.6M	49	\$3.9M	7	\$2.0M
Greenfield	66	\$13.2M	288	\$29.3M	645	\$56.4M	46	\$4.5M
McCordsville	7	\$0.6M	8	\$0.7M	6	\$0.6M	4	\$0.3M
New Palestine	27	\$2.1M	1	\$0.1M	3	\$0.2M	3	\$0.2M
Spring Lake	0	0	0	0	0	0	1	\$0.1M
<b>Total</b>	<b>279</b>	<b>\$34.1M</b>	<b>491</b>	<b>\$45.7M</b>	<b>820</b>	<b>\$70.6M</b>	<b>305</b>	<b>\$33.6M</b>

*Structures and damages within each zone are not inclusive*

Utilizing the same GIS information and process, **Table 3-10** identifies the number of critical infrastructure within each of the Special Flood Hazard Areas (SFHA) in Hancock County. These buildings are included in the overall number of structures and damage estimate information provided in Table 3-7.

**Table 3-10 Critical Infrastructure in SFHA by NFIP Community**

NFIP COMMUNITY	FLOODWAY	1%	0.2%	UNNUMBERED
Hancock County	Conservation Club Heartland Campgrounds KOA Campgrounds S&H Campground Doe Creek Sewer Utility Hoosier Propane	Body of Christ New Pal Church of Christ Mt Carmel Primitive Baptist Bell Professional Mortuary Service	Fortville Christian Irving Materials Oaklandon Christian	
Cumberland				
Fortville		Water Tower	Bridge Church	
Greenfield		Friends Church Public Library Boys & Girls Club Eunice Austin Daycare Central High School WWTP Utilities	Church of Bible Covenant Apostolic Pentecostal Church Bluestone Apts Lucky's Daycare Armory	
McCordsville		Promises and Possibilities		
New Palestine				
Spring Lake		Spring Lake Dam		

*Structures within each zone are not inclusive*

Utilizing the information in Table 3-7 regarding the number of structures within each Flood Hazard Area, it is also important to note the number of flood insurance policies within each NFIP area in Hancock County. **Table 3-11** provides the comparison between the number of structures in the SFHA and the number of flood insurance policies. It is also important to note that flood insurance is voluntary unless the property owner carries a federally subsidized mortgage; insurance coverage may be discontinued when the mortgage is completed.

**Table 3-11 Number of Structures in the SFHA and Number of Flood Insurance Policies**

NFIP COMMUNITY	# STRUCTURES IN SFHA	# POLICIES
Hancock County	723	174
Cumberland	2	4
Fortville	65	3
Greenfield	1,045	116
McCordsville	25	5
New Palestine	34	5
Spring Lake	1	
<b>Total</b>	<b>1,895</b>	<b>307</b>

*(IDNR, 2015)*

### *Future Considerations*

As the municipalities within Hancock County continue to grow in population, it can be anticipated that the number of critical and non-critical infrastructure will also increase accordingly. Location of these new facilities should be carefully considered and precautions should be encouraged to ensure that school, medical facilities, community centers, municipal buildings, and other critical infrastructure are located outside the 0.2% annual chance (500-year) floodplain and/or are protected to that level along with a flood-free access to reduce the risk of damages caused by flooding and to ensure that these critical infrastructure will be able to continue functioning during major flood events.

It is also important to ensure that owners and occupants of residences and businesses within the known hazard areas, such as delineated or approximated flood zones, are well informed about the potential impacts from flooding incidents as well as proper methods to protect themselves and their property.

Despite these efforts, the overall vulnerability and monetary value of damages is expected to increase in the area unless additional measures, such as those discussed later in Chapter 4 of this report, are implemented.



**Figure 3-12 Fire Engine in Flood Waters**

Indirect effects of flooding may include increased emergency response times due to flooded or redirected streets (Figure 3-12), the danger of dislodged and floating propane tanks causing explosions, and the need for additional personnel to carry out the necessary evacuations. Additional effects may include sheltering needs for those evacuated, and the loss of income or revenue related to business interruptions. As many communities within Hancock County are closely tied to the river systems, special events occurring near to or on these rivers and waterways may be cancelled or

postponed during periods of flooding or high water levels.

### Flood: Relationship to Other Hazards

While flooding creates social, physical, and economic losses, it may also cause other hazards to occur. For example flooding may increase the potential for a

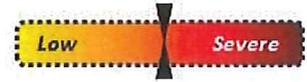
hazardous materials incident to occur. Above ground storage facilities may be toppled or become loosened and actually migrate from the original location. In less severe situations, the materials commonly stored in homes and garages such as oils, cleaners, and de-greasers, may be mobilized by flood waters. Should access roads to hazardous materials handlers become flooded, or if bridges are damaged by flood waters, response times to more significant incidents may be increased, potentially increasing the damages associated with the release.

Increased volumes of water during a flood event may also lead to a dam failure. As the water levels rise in areas protected by dams, at some point, these structures will over-top or will breach leading to even more water released. These two hazards, flood and dam failure, when combined, may certainly result in catastrophic damages.

In a similar fashion, a snow storm or ice storm can also lead to flooding on either a localized or regional scale. When a large amount of snow or ice accumulates, the potential for a flood is increased. As the snow or ice melts, and the ground becomes saturated or remains frozen, downstream flooding may occur. Ice jams near bridges and culverts may also result in flooding of localized areas and potentially damage the bridge or culvert itself.

Flooding in known hazard areas may also be caused by dams that experience structural damages or failures not related to increased volumes or velocities of water. These "sunny day failures", while not typical, may occur wherever these structures exist.

3.3.5 Hailstorms, Thunderstorms, and Windstorms



Hailstorms, Thunderstorms, and Windstorms: Overview

Hail occurs when frozen water droplets form inside a thunderstorm cloud, and then grow into ice formations held aloft by powerful thunderstorm updrafts, and when the weight of the ice formations becomes too heavy, they fall to the ground as hail. Hail size ranges from smaller than a pea to as large as a softball, and can be very destructive to buildings, vehicles (Figure 3-13), and crops. Even small hail can cause significant damage to young and tender plants. Residents should take cover immediately in a hailstorm, and protect pets and livestock, which are particularly vulnerable to hail, and should be under shelter as well.

Thunderstorms are defined as strong storm systems produced by a cumulonimbus cloud, usually accompanied by thunder, lightning, gusty winds, and heavy rains. All thunderstorms are considered dangerous as lightening is one of the by-products of the initial storm. In the United States, on average, 300 people are injured and 80 people are killed each year by lightning. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms. Other associated dangers of thunderstorms included tornados, strong winds, hail, and flash flooding.

Windstorms or high winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low pressure systems). High winds are speeds reaching 50 mph or greater, either sustained or gusting.

Hailstorm, Thunderstorm, and Windstorm: Recent Occurrences



Figure 3-13 Damaging Hail on Vehicles

In Hancock County, the NCDL has recorded 26 hailstorms and 46 thunderstorms/windstorms between October 2007 and January 2016. The largest recorded hailstone was 1.75 inch in diameter and has occurred on several events, most recently September 21, 2012 in Gem. The average diameter hailstone occurring throughout Hancock County is 1.2 inches.

Significant windstorms are characterized by the top wind speeds achieved during the incident, characteristically occur in conjunction with thunderstorms, and have historically occurred year round with the greatest frequency and damage occurring in May, June, and July. Within Hancock County,

NCDC reports 40 instances between October 2007 and January 2015 where top wind speeds were greater than 60 mph.

Total NCDC recorded damages for hailstorms, thunderstorms, and windstorms throughout Hancock County are \$329.2K. The NCDC also reports 2 injuries where men were working on a hog barn when wind gusts moved into the area. Many event reports included in the NCDC did not provide descriptive information on the social, physical, and economic losses resulting from individual storms specific to Hancock County. Appendix 6 provides the NCDC information regarding hailstorms, thunderstorms, and windstorms that have resulted in injuries, deaths, and monetary damages to property and/or crops.

On February 28, 2011 thunderstorms, heavy rain, hail, and high winds caused damage to trees and power lines. Most notably was approximately \$147K in damages to structures along SR 67 in Fortville. Roofs were blown off homes, a semi-trailer was blown over and two garages were reported to have collapsed.

According to the Institute for Business and Home Safety, central Indiana can expect to experience damaging hailstorms 3-4 times over 20 years; the average life of a residential roof. Further, thunderstorms and windstorms are considered a high frequency hazard and may occur numerous times per year.

The Committee determined the probability of a hailstorm, thunderstorm, or windstorm occurring in Hancock County is "Highly Likely" and will typically affect broad portions of the county at one time resulting in potentially "Limited" damages. The Town of McCordsville representatives determined that should such an event occur within their jurisdiction, the damages would be near "Critical". As advancements in technologies such as weather radar systems and broadcast alerts are continually made, the warning time for such incidents may increase. Currently, the Committee feels that the warning time is anticipated to be less than 6 hours and the duration is expected to last less than 1 day.

Indicative of a regional hazard, the probability, magnitude, warning time, and duration of a hailstorm, thunderstorm, or windstorm are expected to be much the same throughout the county. These events are highly unpredictable and the occurrences are distributed through the county. Therefore the CPRI values reflect the equally distributed risk and associated priority for a hailstorm, thunderstorm, or windstorm. A summary is provided in **Table 3-12**.

**Table 3-12 CPRI for Hailstorm, Thunderstorm, and Windstorm**

	PROBABILITY	MAGNITUDE /SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of Cumberland	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of Fortville	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
City of Greenfield	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of McCordsville	Highly Likely	Critical	< 6 Hours	< 1 Day	Severe
Town of New Palestine	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of Spring Lake	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe

Specific locations and frequency of hailstorms, thunderstorms, and windstorms are difficult to predict as many of these individual events are without significant warning time and may have impacts to very limited areas, or may affect broader areas. However, based on NCDC data and personal experiences of the Committee, it was determined that all areas within the County are anticipated to experience a hailstorm, thunderstorm, or windstorm within the calendar year. More likely, these communities will be impacted by several of these hazard events each year.

#### Hailstorm, Thunderstorm, and Windstorm: Assessing Vulnerability

The effects of a hailstorm, thunderstorm, or windstorm may be minimal to extensive in nature and may affect small or broad ranges of land area. Within Hancock County, direct and indirect effects from a hailstorm, thunderstorm, or windstorm may include:

##### **Direct Effects:**

- Damages to infrastructure (power lines)
- Damages to individual properties (homes, cars)

##### **Indirect Effects:**

- Downed power lines due to falling tree limbs
- Losses associated with power outages
- Damages sustained from blowing debris

#### *Estimating Potential Losses*

Due to the unpredictability of this hazard all critical infrastructure and non-critical structures in Hancock County are at risk of damage including temporary or permanent loss of function. For hailstorms, thunderstorms, and



*Figure 3-14 Home Damaged During Windstorm*

windstorms, it is not possible to isolate specific critical infrastructure or non-critical structures that would be more or less vulnerable to damages. However, areas where utility lines are above ground and areas where dead or dying trees have not been removed may be at a higher risk of property damages or power outages during hailstorms, thunderstorms, and windstorms. Additionally, mobile homes and accessory buildings such as pole barns and sheds may also be at a higher risk of damages from hailstorms, thunderstorms, and windstorms if not properly anchored to the ground. Damages from falling limbs or uprooted trees such as shown in **Figure 3-14**, are common.

#### *Future Considerations*

As the populations of the communities in Hancock County continue to grow, it can be anticipated that the number of critical and non-critical structures will also increase. In order to reduce the vulnerability for damages resulting from a hailstorm, thunderstorm, or windstorm, measures such as proper anchoring, enforcement of the International Building Codes, and burial of power lines should be completed. While measures can be taken to remove existing structures or prevent future structures from being built in known hazard areas such as floodplains and hazardous materials facility buffers, such measures are not applicable to hailstorms, thunderstorms, and windstorms due to the diffuse nature and regional impacts of this hazard.

Indirect effects resulting from a hailstorm, thunderstorm, or windstorm can include power outages caused by downed tree limbs, damages resulting from prolonged power outages, and damages to structures or property as a result of debris.

#### Hailstorm, Thunderstorm, and Windstorm: Relationship to Other Hazards

Hailstorms, thunderstorms, and windstorms may be the precursor for other hazards. For example, hazardous materials incidents can be the result of a hailstorm, thunderstorm, or a windstorm. Material storage containers can become damaged by high winds, debris, or even lightning, and can result in a spill or release of materials. With wind speeds greater than 58 mph, tankers and other transportation vehicles carrying hazardous materials are also at risk while on the road. High winds may also cause gaseous substances to travel farther distances at a much faster rate, increasing the evacuation area necessary to protect residents and visitors of Hancock County.

Additionally, rainfall typically occurs with a thunderstorm and this additional precipitation may lead to localized flooding or riverine flooding depending on the amount of rain during the event. Debris from a windstorm may also lead to localized flooding if debris is deposited over drains or if obstructions are created by downed limbs, trees, or other storm related debris. A similar concern due to the potential precipitation would be dam failure. High winds may also lead to structural damages to a dam, or may cause damages to nearby trees or other structures, leading to indirect damages to the dam.

The risk of social losses also increases during a hailstorm, thunderstorm, or windstorm as many times, these hazards result in downed power lines, utility poles, and trees. Debris such as this may impede traffic patterns and make it difficult for emergency vehicles (Fire, EMS, and Police) to pass through affected areas or people may be directly injured as a result of falling debris.

### 3.3.6 Tornado



#### Tornado: Overview

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 funnel cloud may reach the ground very quickly – becoming a tornado. If there is debris lifted and blown around by the “funnel cloud”, then it has reached the ground and is a tornado.

A tornado is generated when conditions in a strong cell are produced that exhibit a wall of cool air that overrides a layer of warm air. The underlying layer of warm air rapidly rises, while the layer of cool air drops – sparking the swirling action. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally April through June in Indiana, although tornadoes can occur at any time of year. Tornadoes tend to occur in the afternoons and evenings; over 80 percent of all tornadoes strike between 3:00 pm and 9:00 pm, but can occur at any time of day or night as shown in **Figure 3-15**. Tornadoes occur most frequently in the United States east of the Rocky Mountains. Tornadoes in Indiana generally come from the south through the east.



*Figure 3-15 Funnel Cloud During a Lightning Storm at Night*

While most tornadoes (69%) have winds of less than 100 mph, they can be much stronger. Although violent tornadoes (winds greater than 205 mph) account for only 2% of all tornadoes, they cause 70% of all tornado deaths. In 1931, a tornado in Minnesota lifted an 83-ton rail car with 117 passengers and carried it more than 80 feet. In another instance, a tornado in Oklahoma carried a motel sign 30 miles and dropped it in Arkansas. In 1975, a Mississippi tornado carried a home freezer more than a mile.

#### Tornado: Recent Occurrences

The classification of tornadoes utilizes the Fujita Scale of tornado intensity, described in **Table 3-13**. Tornado intensity ranges from low intensity (F0) tornadoes with effective wind speeds of 40-70 mph to high intensity (F5+) tornadoes with effective wind speeds of 261-318+ mph. According to the NCDC, Hancock County has experienced 3 tornadoes (1-F0; 2-F1) between October 2007 and January 2016.

**Table 3-13 Fujita Scale of Tornado Intensity**

F-SCALE	WINDS	CHARACTER OF DAMAGE	RELATIVE FREQUENCY
F0 (weak)	40-72 mph	Light damage	29%
F1 (weak)	73-112 mph	Moderate damage	40%
F2 (strong)	113-157 mph	Considerable damage	24%
F3 (strong)	158-206 mph	Severe damage	6%
F4 (violent)	207-260 mph	Devastating damage	2%
F5 (violent)	261-318 mph	Incredible damage	<1%

A tornado reported by the NCDC occurred on May 30, 2008 near McCordsville and resulted in approximately \$500K in property damages to several farm buildings and homes in the area. Another event, occurring on October 26, 2010, consisted of an EF-0 touch down near Warrington (northwest of Wilkinson) and caused damage to several outbuildings and destroyed a garage.

May 30, 2008 was the date an EF-1 traveled through Marion County into Hancock County near North County Road south of 38<sup>th</sup> Street. Traveling for 4 miles with a width of 100 yards and winds of near 100 mph, numerous barns, houses, trees and powerlines were damaged along the path.

The Committee estimated the probability of a tornado occurring in the unincorporated areas of Hancock County (including New Palestine and Spring Lake) would be “Likely”, while “Possible” within the communities of Cumberland, Fortville, Greenfield, and McCordsville. The magnitude and severity of such an event to be “Critical” if a tornado were to strike any of the municipalities. As with many hazardous events, the Committee anticipated a short warning time, less than 6 hours, and a short duration, also less than 6 hours. The summary is shown in **Table 3-14**.

**Table 3-14 CPRI for Tornado**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Likely	Critical	< 6 Hours	< 6 Hours	Elevated
Town of Cumberland	Possible	Critical	< 6 Hours	< 6 Hours	Elevated
Town of Fortville	Possible	Critical	< 6 Hours	< 6 Hours	Elevated
City of Greenfield	Possible	Critical	< 6 Hours	< 6 Hours	Elevated
Town of McCordsville	Possible	Critical	< 6 Hours	< 6 Hours	Elevated
Town of New Palestine	Likely	Critical	< 6 Hours	< 6 Hours	Elevated
Town of Spring Lake	Likely	Critical	< 6 Hours	< 6 Hours	Elevated

The Indiana State Climate Office estimates that throughout Indiana, there is an average of 20 tornado touchdowns per year. Based on the number of tornado

touchdowns previously reported through the NCDC and local weather agencies, the Committee determined the probability of a future tornado occurring in Hancock County is Possible to Likely (within the next 3-5 years).

#### Tornado: Assessing Vulnerability

As a path of a tornado is not pre-defined, it is difficult to isolate specific critical infrastructure and non-critical structures, or areas of Hancock County that would be more or less vulnerable to a tornado. Direct and indirect effects from a tornado may include:

##### **Direct Effects:**

- Damages to older construction structures, mobile homes, and accessory structures (pole barns, sheds, etc.)
- Damages to above ground utility lines and structures

##### **Indirect Effects:**

- Expenses related to debris clean-up and/or reconstruction
- Loss of revenue for affected businesses
- Loss of work if employers are affected

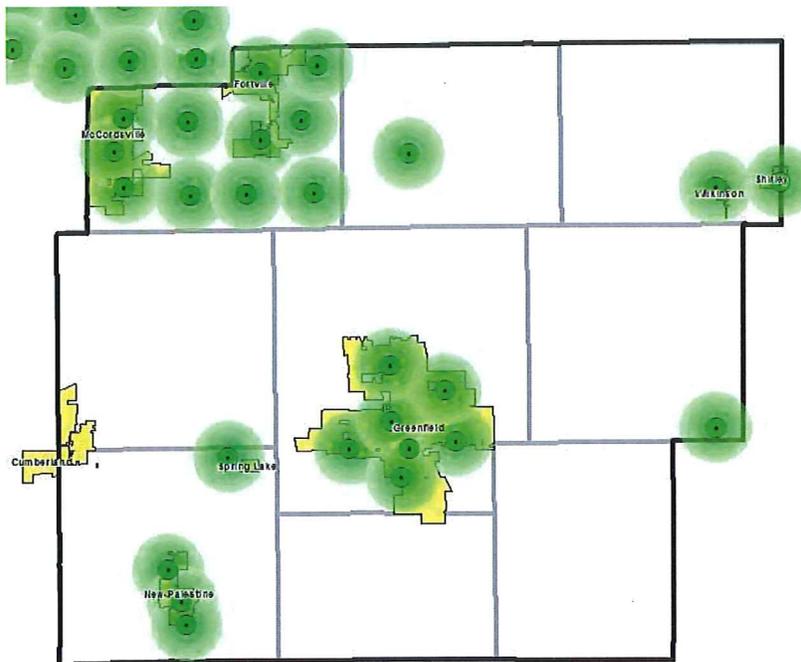
#### *Estimating Potential Losses*

Due to the unpredictability of this hazard, all critical and non-critical structures within the County are at risk of future damage or loss of function. Estimates of potential physical losses were determined through a hypothetical exercise where F2 intensity tornadoes traveled through portions of the County. This is intended to present a “what-if” scenario of a tornado incident and associated damages. Damage estimates were derived by assuming that 25% of all structures in the path of the tornado would be completely destroyed, 35% would be 50% damaged, and 40% would have only 25% damage. These estimations were also determined utilizing 3 wind speed zones based on distance from the tornado path. Zone A is nearest the center of the tornado path, while Zone C is the farthest from the path and with a theoretical lower wind speed. **Table 3-15** provides summary data for the hypothetical tornado, which is identified on **Exhibit 3**.

**Table 3-15 Summary of Hypothetical Tornado Damages**

ZONE	NUMBER OF STRUCTURES DAMAGED	ESTIMATED DAMAGE (\$)
Zone A	202	\$22.1M
Zone B	224	\$14.7M
Zone C	356	\$21.7M
<b>TOTAL</b>	<b>782</b>	<b>\$58.5M</b>

*Future Considerations*



**Figure 3-16 Hancock County Outdoor Warning Sirens**

Within Hancock County, there are numerous events each year that draw thousands of guests. Due to this, it is imperative that the EMA place continued importance on the need to maintain, and as necessary, upgrade their outdoor warning siren coverage. Currently, much of the more populous areas of the County are covered by the audible ranges of the existing outdoor warning sirens. The existing siren locations and their coverage areas are provided in **Figure 3-16**.

There may also be indirect effects of a tornado event. For example, post-event clean-up may result in high expenses or inability to work for property owners that have

experienced damages from either the tornado directly or by debris from high winds. Affected business owners may experience loss of revenue if unable to continue operations following the event. Similarly, if a business is affected and unable to operate, employees may experience a loss of wages during the period of recovery.

Tornado: Relationship to Other Hazards

Tornadoes may result in a hazardous materials incident. Material storage containers can become damaged by high winds and debris can result in a spill or release of materials. As wind speeds increase, the potential for damages to above ground storage containers also increases. Tankers and other

transportation vehicles carrying hazardous materials are also at an increased risk while on the road or rail.

Tornadoes may also result in a dam failure as the increased wind speeds, and debris caused by the tornado, may directly impact the dam, or cause indirect damages through large debris or downed trees. In addition, tornadoes may lead to structural fires as the destruction path is sometimes long and broad, leading to an increased number of potentially damaged homes, exposed power lines, and large amounts of debris.

### 3.3.7 Winter Storm & Ice



#### Winter Storm & Ice: Overview

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, ice storms, freezing rain or sleet, heavy snowfall with blinding wind-driven snow, and extremely cold temperatures that can last for several days. Some winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A winter storm is one that drops 4 or more inches of snow during a 12-hour period, or 6 or more inches during a 24-hour span. An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can affect a community or region for days, weeks, and even months.



*Figure 3-17 Ice Covered Power Lines*

Storm effects such as extreme cold, flooding, and snow and ice accumulation (**Figure 3-17**) can cause hazardous conditions and hidden problems for people in the affected area. People can become stranded on the road or trapped at home, without utilities or other services, including food, water, and fuel supplies. The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they may indirectly cause transportation accidents, and injury and death resulting from

exhaustion/overexertion, hypothermia and frostbite from wind chill, and asphyxiation; and house fires occur more frequently in the winter due to lack of proper safety precautions.

Wind chill is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the NWS implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index, which was based on the 1945 Siple and Passel Index.

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. A blizzard warning means that large amounts of falling or blowing snow and sustained winds of at least 35 mph are expected for several hours. Winter storms are common in Hancock County. Such conditions can result in substantial personal and property damage, even death.

#### Winter Storm & Ice: Recent Occurrences

Since the completion of the September 2007 Hancock County MHMP, the NCDC has recorded 8 winter storms, 3 heavy snow, 1 blizzard, and 1 ice storm events. While no injuries or deaths were reported with these events, approximately \$15K in property damages was reported. Narrative descriptions indicated poor travel conditions, power outages and debris associated with similar events. During the March 4, 2008 event, approximately 30 trees fell in Greenfield due to ice accumulation.

Appendix 6 provides the NCDC information regarding snow storms and ice storms that have resulted in injuries, deaths, or monetary damages to property and/or crops.

The probability, magnitude, warning times, and duration of a snow storm or ice storm causing disruption to residents and businesses in Hancock County, as determined by the Planning Committee, is expected to be consistent throughout the County and NFIP communities. It is "Highly Likely" to "Likely" that this type of hazard will occur in this area and will typically affect the entire county, and possibly several surrounding counties, at one time, resulting in primarily "Limited" to "Critical" severity. The warning time for severe temperatures or several inches of snow associated with a winter storm is usually less than 6 hours while the duration of the incident is anticipated to last greater than 1 day. A summary is shown in **Table 3-16**.

**Table 3-16 CPRI for Winter Storm and Ice**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Likely	Critical	< 6 Hours	< 1 Day	Severe
Town of Cumberland	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of Fortville	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
City of Greenfield	Likely	Limited	< 6 Hours	< 1 Day	Elevated
Town of McCordsville	Highly Likely	Limited	< 6 Hours	< 1 Day	Severe
Town of New Palestine	Likely	Limited	< 6 Hours	< 1 Day	Elevated
Town of Spring Lake	Likely	Limited	< 6 Hours	< 1 Day	Elevated

The Planning Committee determined that the probability for a snow storm or ice storm to occur in Hancock County or any of the communities within is “Likely” to “Highly Likely”. Based on historical data and the experience of the Planning Committee, snow storms and ice storms are common within Hancock County and will continue to be an annual occurrence.

#### Winter Storm & Ice: Assessing Vulnerability

A snow storm typically affects a large regional area with potential for physical, economic, and/or social losses. Direct and indirect effects of a snow storm or ice storm within Hancock County may include:

##### **Direct Effects:**

- More urban area employers may experience loss of production as employees may not be able to get to work
- Rural (County) roads may impassable
- Expenses related to snow removal or brine/sand applications

##### **Indirect Effects:**

- Loss of revenue as businesses are closed
- Increased emergency response times based on safety of roads
- Loss of income if unable to get to place of employment

#### Estimating Potential Losses

Given the nature and complexity of a regional hazard such as a snow storm, it is difficult to quantify potential losses to property and infrastructure. As a result, all critical and non-critical structures and infrastructure are at risk from snow storm and ice storm incidents.

For planning purposes, information collected in snow storms impacting other communities around the nation is also useful in assessing the potential social, physical, and economic impact that a winter storm could have on Allen County communities. For example, a March 2003 snow storm in Denver, Colorado dropped approximately 31 inches of snow and caused an estimated \$34M in total damages. In addition, a February 2003 winter storm dropped an estimated 15-20 inches of snow in parts of Ohio. The Federal and Ohio Emergency Management Agencies and U.S. Small



*Figure 3-18 Travel Impacted During Snow Storm*

Business Administration surveyed damaged areas and issued a preliminary assessment of \$17M in disaster related costs. These costs included snow and debris removal, emergency loss prevention measures, and public utilities repair. The agencies found over 300 homes and businesses either damaged or destroyed in 6 counties. Snow storms and blizzards also make road travel difficult and dangerous, as in **Figure 3-18**.

The Denver, Colorado area snowstorms from December 2006 through January 2007 surpassed the expenses and damages of the 2003 winter storms. In snow removal costs alone, it is estimated that over \$19M was spent throughout the area, with approximately \$6.4M of that allocated to clearing Denver International Airport. Additional economic expenses are realized when such a large storm closes local businesses and Denver International Airport for nearly 48 hours.

While the above examples indicate the wide-ranging and large-scale impact that winter storms can have on a community or region, in general, winter storms tend to result in less direct economic impacts than many other natural hazards. According to the Workshop on the Social and Economic Impacts of Weather, which was sponsored by the U.S. Weather Research Program, the American Meteorological Society, the White House Subcommittee on Natural Disaster Relief, and others, winter storms resulted in an average of 47 deaths and more than \$1B in economic losses per year between 1988 and 1995. However, these totals account for only 3% of the total weather-related economic loss and only 9% of fatalities associated with all weather related hazards over the same period.

#### *Future Considerations*

As populations increase and communities continue to grow in size, the need to respond to snow storms or ice storms will remain an important municipal effort. As new construction or re-development occurs, especially new or existing critical infrastructure, it is important to ensure that these new structures are equipped to deal with the potential risks associated with this hazard. Those may include lengthy power outages and potentially impassable transportation routes, making it difficult to obtain supplies or for passage of response vehicles.

Winter storms can also result in substantial indirect costs. Increased emergency response times, loss of work or the inability to get to work, as well as business interruption, are possible indirect effects of a winter storm. According to a report by the National Center for Environmental Predictions, the cold and snowy winter in late 1977 and early 1978, which impacted several

heavily populated regions of the country, was partially responsible for reducing the nation's Gross Domestic Product (GDP) from an estimated growth rate of between 6% and 7% during the first 3 quarters of 1977 to approximately -1% in the last quarter of 1977 and 3% during the first quarter of 1978.

#### Winter Storm & Ice: Relationship to Other Hazards



*Figure 3-19 Flooding Caused by Snow Melt*

Winter storms and ice storms can lead to flooding as the precipitation melts and enters local receiving water bodies. This increased volume of water on already saturated, or still frozen ground can quickly result in flooding related damages to structures and properties (**Figure 3-19**) as well as within the stream or river channel. The increased flooding may then lead to a dam failure within the same area, further exacerbating the damages.

Hazardous materials incidents may be caused by poor road conditions during winter storms or ice storms.

Many hazardous materials are transported by rail or by tanker over highways and interstates. In the more suburban/rural areas of Hancock County, or where open areas are more susceptible to drifted roads, the possibility of a traffic related hazardous materials incident may increase.

Power outages and other infrastructure failures may also occur during a winter storm. Weight from snow and ice accumulations can directly or indirectly cause power lines to fail. During extreme cold temperatures, power outages may prove deadly for certain populations such as the elderly or ill.

## TECHNOLOGICAL HAZARDS

### 3.3.8 Dam Failure



#### Dam Failure: Overview

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is a collapse, breach, or other failure resulting in downstream flooding.

A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Of the approximately 80,000 dams identified nationwide in the National Inventory of Dams, the majority are privately owned. Each dam is assigned a downstream hazard classification based on the potential loss of life and damage to property should the dam fail. The three classifications are high, significant, and low. With changing demographics and land development in downstream areas, hazard classifications are updated continually. The following definitions of hazard classification currently apply to dams in Indiana:

- High Hazard Dam: a structure the failure of which may cause the loss of life and serious damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.
- Significant Hazard Dam: a structure the failure of which may damage isolated homes and highways, or cause the temporary interruption of public utility services.
- Low Hazard Dam: a structure the failure of which may damage farm buildings, agricultural land, or local roads.

Dam Failure: Recent Occurrences

Within Hancock County, there are 2 DNR regulated dams: 1 high hazard dam and 1 low hazard dams as shown on Exhibit 2. The High Hazard dam is the Sugar Hills Lake Dam (**Figure 3-20**). There have been no recorded dam failures within Hancock County.

Based on the information provided to them, the Committee determined the probability of a dam failure is “Unlikely” with an anticipated effect of “Negligible” (areas not anticipated to be within the inundation area) to “Limited” (based on the number of structures or populations downstream of the dam) damages. **Table 3-17** provides a summary of the Planning Committee’s expectations during a dam failure.

**Table 3-17 CPRI for Dam Failure**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Unlikely	Limited	< 6 Hours	< 6 Hours	Low
Town of Cumberland	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low
Town of Fortville	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low
City of Greenfield	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low
Town of McCordsville	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low
Town of New Palestine	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low
Town of Spring Lake	Unlikely	Negligible	< 6 Hours	< 6 Hours	Low

Dam Failure: Assessing Vulnerability

Within Hancock County, direct and indirect effects from a dam failure may include:

**Direct Effects:**

- Loss of life and serious damage to downstream homes, industrial and commercial buildings, public utilities, major highways, or railroads

**Indirect Effects:**

- Loss of land in the immediate scour area
- Increased response times due to damaged or re-routed transportation routes and/or bridges

Due to the conditions beyond the control of the dam owner or engineer, there may be unforeseen structural problems, natural forces, mistakes in operation, negligence, or vandalism that may cause a dam to fail. Unfortunately, the

Sugar Hills Lake Dam does not have an Incident & Emergency Action Plan (IEAP) prepared along with estimated dam failure inundation mapping.

*Estimating Potential Losses*



Figure 3-20 Sugar Hills Lake Dam

The potential dam failure inundation area for the Sugar Hills Lake Dam was overlaid onto recent aerial photography to estimate the number of critical and non-critical structures that may be affected by a dam failure. The actual magnitude and extent of damages depend on the type of dam break, volume of water that is released, and the width of the floodplain valley to accommodate the dam break flood wave. There are 156 structures located within the potential inundation area of the Sugar Hills Lake Dam that are anticipated to receive damages, including two campgrounds, a conservation club, and Spring Lake Dam. Following the same calculation of potential damages as other hazards, it is expected that damages will be near \$16M, not including damages sustained by

transportation routes or the dam itself. **Table 3-18** identifies the potential number of structures and associated damages from a failure of the Sugar Hills Lake Dam.

**Table 3-18 Anticipated Damages from Sugar Hills Lake Dam Failure**

NFIP COMMUNITY	NUMBER OF STRUCTURES DAMAGED	ESTIMATED DAMAGE (\$)
Hancock County	127	\$14.1M
New Palestine	28	\$2.2M
Spring Lake	1	\$0.1M
<b>TOTAL</b>	<b>156</b>	<b>\$16.4M</b>

*Future Considerations*

As areas near existing dams continue to grow in population, it can be anticipated that the number of critical and non-critical structures will also increase accordingly. Location of these new facilities should be carefully considered and precautions should be taken to ensure that schools, medical facilities, municipal buildings, and other critical infrastructure are located

outside of the delineated or estimated dam failure inundation areas. Also, flood-free access should be provided for these facilities.

It is also very important to all downstream communities and property owners that IEAPs are developed for high hazard dams and kept up-to-date as well as routinely exercised to ensure the greatest safety to those within the hazard area.

#### Dam Failure: Relationship to Other Hazards

With the potentially large volumes and velocities of water released during a dam breach, it can be expected that a dam failure would lead to flooding and within the inundation areas downstream of the dam. Downstream bridges and roads are also in danger of being destroyed or damaged due to a dam failure. Bridges may become unstable and portions of road surfaces may be washed away or the entire road may be undermined. Other infrastructure such as utility poles and lines may be damaged as the water flows along the surface or pipes may become exposed due to scouring; all of which may lead to utility failures within the area downstream of the dam failure.

Several other independent hazards may also lead to a dam failure. Hazards such as flooding, the melting of snow or ice, or rapid precipitation associated with thunderstorms, may all lead to increased pressure on the dam structures or overtopping of the structures, leading to failure. Additionally, earthquakes or tornadoes may cause damage to the structures or earthen components of the dam resulting in irreparable damages or failure.

3.3.9 Hazardous Materials Incident



Hazardous Materials Incident: Overview

Hazardous materials are substances that pose a potential threat to life, health, property, and the environment if they are released. Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers, and dangerous gases. Despite precautions taken to ensure careful handling during manufacture, transport, storage, use, and disposal, accidental releases are bound to occur. These releases create a serious hazard for workers, neighbors, and emergency response personnel. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials response units.



*Figure 3-21 Drums of Potentially Hazardous Waste*

As materials are mobilized for treatment, disposal, or transport to another facility, all infrastructure, facilities, and residences in close proximity to the transportation routes are at an elevated risk of being affected by a hazardous materials release. Often these releases can cause serious harm to Hancock County and its residents if proper and immediate actions are not taken. Most releases are the result of human error or improper storage (**Figure 3-21**), and corrective actions to stabilize these incidents may not always be feasible or practical in nature.

Railways often transport materials that are classified as hazardous and preparations need to be made and exercised for situations such as derailments, train/vehicle crashes, and/or general leaks and spills from transport cars.

Hazardous Materials Incident: Recent Occurrences

During conversations with Committee members and through information provided by local news outlets, it was noted that no significant incidents involving manufacturing facilities and transportation routes have occurred since the development of the original MHMP. However, the number of facilities utilizing, storing, and/or manufacturing chemicals and the number of high volume transportation routes increase the likelihood of an incident.

According to the Committee, the probability of a hazardous materials release or incident is “Possible” to “Likely” within the areas of the County and “Critical” damages are anticipated to result from an incident dependent upon the location of the incident. As with hazards of this nature, a short warning time of

less than 6 hours and a varied duration, are anticipated in the event of a hazardous materials incident. A summary is shown in **Table 3-19**.

**Table 3-19 CPRI for Hazardous Materials Incident**

	PROBABILITY	MAGNITUDE/ SEVERITY	WARNING TIME	DURATION	CPRI
Hancock County	Likely	Critical	< 6 Hours	< 1 Day	Severe
Town of Cumberland	Possible	Critical	< 6 Hours	< 1 Day	Elevated
Town of Fortville	Possible	Critical	< 6 Hours	< 1 Day	Elevated
City of Greenfield	Likely	Critical	< 6 Hours	< 1 Day	Elevated
Town of McCordsville	Likely	Critical	< 6 Hours	< 1 Day	Severe
Town of New Palestine	Likely	Critical	< 6 Hours	< 1 Day	Severe
Town of Spring Lake	Possible	Critical	< 6 Hours	< 1 Day	Elevated

Relatively small hazardous materials incidents have occurred throughout Hancock County in the past and may, according to the Committee, to occur again. As the number of hazardous materials producers, users, and transporters increase within or surrounding Hancock County, it can be anticipated that the likelihood of a future incident will also increase.

Hazardous Materials Incident: Assessing Vulnerability

Within Hancock County, direct and indirect effects from a hazardous materials incident may include:

**Direct Effects:**

- More densely populated areas with a larger number of structures, railroad crossings, and heavily traveled routes are more vulnerable
- Expense of re-construction of affected structures

**Indirect Effects:**

- Loss of revenue or production while recovery and/or reconstruction occurs
- Anxiety or stress related to event
- Potential evacuation of neighboring structures or facilities

While the possibility of an incident occurring may be likely, the vulnerability of Hancock County has been lowered due to the enactment of Superfund Amendments and Reauthorization Act (SARA) Title III national, state and local requirements. SARA Title III, also known as the Emergency Planning and Community Right to Know Act (EPCRA), establishes requirements for planning and training at all levels of government and industry. EPCRA also establishes provisions for citizens to have access to information related to the type and

quantity of hazardous materials being utilized, stored, transported or released within their communities.

One local result of SARA Title III is the formation of the Local Emergency Planning Commission (LEPC). This commission has the responsibility for preparing and implementing emergency response plans, cataloging Material Safety Data Sheets (MSDS), chemical inventories of local industries and businesses, and reporting materials necessary for compliance.

In Hancock County, 50 extremely hazardous substance (EHS) facilities that are subject to SARA Title III provisions due to the presence of listed hazardous materials in quantities at or above the minimum threshold established by the Act. These facilities are also required to create and distribute emergency plans and facility maps to local emergency responders such as the LEPC, fire departments, and police departments. With this knowledge on hand, emergency responders and other local government officials can be better prepared to plan for an emergency, the response it would require, and prevent serious affects to the community involved.

#### *Estimating Potential Losses*



*Figure 3-22 Fuel Tanker Fire*

In addition, the very nature of these events makes predicting the extent of their damage very difficult. A small-scale spill or release might have a minor impact and would likely require only minimal response efforts. Another slightly larger incident might result in the disruption of business or traffic patterns, and in this situation might require active control response measures to contain a spill or release. On the other hand, even small or moderate events could potentially grow large enough that mass evacuations or shelter in

place techniques are needed, multiple levels of response are utilized, and additional hazards such as structural fires and/or additional hazardous materials releases (or explosions) may occur. Given the unpredictable nature of hazardous materials incident, an estimate of potential losses was not estimated.

#### *Future Considerations*

Additional facilities, both critical and non-critical in nature may be affected if a hazardous materials release were to occur along a transportation route.

Several routes including railways, Interstate 70, US Highway 36, 40, 52 and State Routes 9, 109, and 234 are traveled by carriers of hazardous materials.

By restricting development within the known hazardous materials facility buffer zones, future losses associated with a hazardous materials release can be reduced. Critical infrastructure especially should be discouraged from being located within these areas. Further, by restricting construction in these zones, the number of potentially impacted residents may also be greatly reduced, lowering the risk for social losses, injuries, and potential deaths. Future construction of hazardous materials facilities should be located away from critical infrastructure such as schools, medical facilities, municipal buildings, and daycares, reducing the risk to highly populated buildings and potentially populations with special needs or considerations such as children, elderly, and medically unfit.

#### Hazardous Materials Incident: Relationship to Other Hazards

Dependent on the nature of the release, conditions may exist where an ignition source such as a fire or spark is in close proximity to a flammable or explosive substance. As the fire spreads throughout the facility or the area, structural and/or property damages will increase. Response times to a hazardous materials incident may be prolonged until all necessary information is collected detailing the type and amount of chemicals potentially involved in the incident. While this may increase structural losses, it may actually decrease the social losses such as injuries or even deaths.

### 3.4 HAZARD SUMMARY

For the development of this MHMP, the Committee utilized the CPRI method to prioritize the hazards they felt affected Hancock County. Hazards were assigned values based on the probability or likelihood of occurrence, the magnitude or severity of the incident, as well as warning time and duration of the incident itself. A weighted CPRI was calculated based on the percent of the County's population present in the individual NFIP communities.

**Table 3-20** summarizes the CPRI values for the various hazards studied within this MHMP. "Severe" hazards are flood; hail, thunder, windstorm; and hazardous materials incident. The hazards that ranked as "Elevated" risk were drought; earthquake; extreme temperature; tornado; and winter storm and ice storm. The hazard with a "Low" risk was dam failure.

**Table 3-20 Combined CPRI**

TYPE OF HAZARD	LIST OF HAZARDS	WEIGHTED AVERAGE CPRI
Natural	Drought	
	Earthquake	
	Extreme Temperature	
	Flood	
	Hail/Thunder/Windstorm	
	Tornado	
	Winter Storm/Ice	
Technological	Dam Failure	
	Hazardous Materials Incident	

It can be important to understand the cause and effect relationship between the hazards selected by the Committee. **Table 3-21** can be utilized to identify those relationships. For example, a winter storm (along the side of the table) can result in a flood (along the top of the table). In a similar fashion, a hazardous materials incident (along the top of the table) can be caused by an earthquake; flood; tornado; or a winter storm or ice storm (along the side of the table).

**Table 3-21 Hazard Relationship Table**

<b>EFFECT</b> →	<b>Drought</b>	<b>Earthquake</b>	<b>Extreme Temperatures</b>	<b>Flooding</b>	<b>Hailstorm, Thunderstorm, Windstorm</b>	<b>Tornado</b>	<b>Winter Storm, Ice</b>	<b>Dam Failure</b>	<b>Hazardous Materials</b>
↓ <b>CAUSE</b>									
Drought									
Earthquake								X	X
Extreme Temperatures									
Flooding								X	X
Hailstorm, Thunderstorm, Windstorm				X				X	X
Tornado								X	X
Winter Storm, Ice				X				X	X
Dam Failure				X					X
Hazardous Materials									

As a method of better identifying the potential relationships between hazards, Exhibit 2 can be referenced to indicate the proximity of one or more known hazard areas such as the delineated floodplains and the locations of EHS facilities. For this reason, the City of Greenfield or any other community may be impacted by more than one hazard at a time, depending on certain conditions. It can be anticipated that if a flood were to occur within these areas, there would be a potentially increased risk of this facility experiencing a hazardous materials incident.

Future development in areas where multiple known hazard areas (dam failure inundations areas, floodplains and surrounding hazardous materials facilities) overlap should undergo careful design, review, and construction protocol to reduce the risk of social, physical, and economic losses due to a hazard incident. While it may certainly be difficult, critical infrastructure should not be constructed within these regions.



## CHAPTER 4

# MITIGATION GOALS AND PRACTICES

This section identifies the overall goal for the development and implementation of the Hancock County MHMP. A summary of existing and proposed mitigation practices discussed by the Committee is also provided.

### 4.1 MITIGATION GOAL

**REQUIREMENT §201.6(c)(3)(i):**

*[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

The Committee reviewed the mitigation goals as outlined within the 2007 Hancock County MHMP and determined that each of these remain valid and effective. In summary, the overall goal of the Hancock County MHMP is to reduce the social, physical, and economic losses associated with hazard incidents through emergency services, natural resource protection, prevention, property protection, public information, and structural control mitigation practices.

### 4.2 MITIGATION PRACTICES

**REQUIREMENT §201.6(c)(3)(ii):**

*[The mitigation strategy shall include a] section that identifies and analyzed a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

**REQUIREMENT §201.6(c)(3)(iii):**

*[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

In 2005, the Multi-Hazard Mitigation Council conducted a study about the benefits of hazard mitigation. This study examined grants over a 10-year period (1993-2003) aimed at reducing future damages from earthquake, wind, and flood. It found that mitigation efforts were cost-effective at reducing future losses; resulted in significant benefits to society; and represented significant potential savings to federal treasury in terms of reduced hazard-related expenditures. This study found that every \$1 spent on mitigation

efforts resulted in an average of \$4 savings for the community. The study also found that FEMA mitigation grants are cost-effective since they often lead to additional non-federally funded mitigation activities, and have the greatest benefits in communities that have institutionalized hazard mitigation programs. Six primary mitigation practices defined by FEMA are:

- **Emergency Services** – measures that protect people during and after a hazard.
- **Natural Resource Protection** – opportunities to preserve and restore natural areas and their function to reduce the impact of hazards.
- **Prevention** – measures that are designed to keep the problem from occurring or getting worse.
- **Property Protection** – measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away.
- **Public Information** – those activities that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards.
- **Structural Control** – physical measures used to prevent hazards from reaching a property.

#### 4.2.1 Existing Mitigation Practices

As part of this planning effort, the Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements, as well as suggested new practices. The following is a summary of existing hazard mitigation practices within Hancock County. Mitigation measures that were included in the 2007 Hancock County MHMP are noted as such.

##### Emergency Services

- The County maintains outdoor warning sirens providing coverage for the majority of the populated areas of Hancock County. *(2007 Measure)*
- The County has developed a centralized system for testing, maintenance, and operation of outdoor warning sirens. *(2007 Measure)*
- The County utilizes Blackboard Connect for mass alerts for weather or hazardous events. *(2007 Measure)*
- Weather radios are encouraged throughout the County during presentations, events, and on the EMA website. *(2007 Measure)*
- Stream gages are utilized for flood forecasting and flood warnings for various stream levels. *(2007 Measure)*

### Natural Resource Protection

- Hancock County, the Town of Cumberland, Town of Fortville, City of Greenfield, the Town of McCordsville, the Town of New Palestine, and the Town of Spring Lake are in good standing with the NFIP Program and have flood protection ordinances which meet minimum requirements.
- The MS4 communities enforce erosion and sediment control practices during construction activities to prevent the restriction of conveyances from sedimentation. *(2007 Measure)*

### Prevention

- Information related to hazard mitigation has been incorporated, where appropriate, into individual Comprehensive Land Use Plans and other long-range plans. *(2007 Measure)*
- Several representatives participate in the Indiana Association of Floodplain and Stormwater Managers (INAFSM) or are certified as a CFM. *(2007 Measure)*
- Hancock County and the City of Greenfield have developed GIS databases which are used in land use planning decisions and can be utilized in HAZUS-MH “what-if” scenarios. *(2007 Measure)*
- The Hancock County LEPC provides routine training regarding the proper storage, transport, and disposal of hazardous materials. *(2007 Measure)*
- Electric providers routinely complete preventative maintenance on trees within the ROW and utility corridor. *(2007 Measure)*
- Local developers routinely bury new and retrofitted utilities to minimize exposure to hazards. *(2007 Measure)*
- The City of Greenfield, the Town of McCordsville, and Hancock County continues to implement the erosion and sediment control BMPs identified in the Storm Water Quality Management Plan (SWQMP) required by Rule 13 *(2007 Measure)*

### Property Protection

- All communities follow the International Building Code which includes requirements to minimize damages from natural hazards.

### Public Information

- Outreach materials are routinely provided within office and agencies throughout Hancock County, large public events, speaking opportunities within schools, etc. (2007 Measure)

#### Structural Control

- Stormwater conveyances and regulated drains are maintained on a routine basis to prevent localized flooding, increased erosion, and material deposition as a result of rainfall or snowmelt. (2007 Measure)
- Sugar Hills Lake Dam is routinely inspected as required by IDNR (2007 Measure)

#### 4.2.2 Proposed Mitigation Practices

After reviewing existing mitigation practices, the Committee reviewed the list of mitigation ideas for each of the hazards studied as a part of this planning effort and identified which of these they felt best met their needs as a community according to selected social, technical, administrative, political, and legal criteria. The following identifies the key considerations for each evaluation criteria:

- **Social** – the proposed mitigation projects will have community acceptance, they are compatible with present and future community values, and do not adversely affect one segment of the population.
- **Technical** – the proposed mitigation project will be technically feasible, reduce losses in the long-term, and will not create more problems than they solve.
- **Administrative** – the proposed mitigation projects may require additional staff time, alternative sources of funding, and have some maintenance requirements.
- **Political** – the proposed mitigation projects will have political and public support.
- **Legal** – the proposed mitigation projects will be implemented through the laws, ordinances, and resolutions that are in place.
- **Economic** – the proposed mitigation projects can be funded in current or upcoming budget cycles.
- **Environmental** – the proposed mitigation projects may have negative consequences on environmental assets such as wetlands, threatened or endangered species, or other protected natural resources.

**Table 4-1** lists a summary of all proposed mitigation practices identified for all hazards, as well as information on the local status, local priority, benefit-cost ratio, project location, responsible entity, and potential funding source, associated with each proposed practice. The proposed mitigation practices are

listed in order of importance to Hancock County for implementation. Projects identified by the Committee to be of “high” local priority may be implemented within 5 years from final Plan adoption. Projects identified to be of “moderate” local priority may be implemented within 5-10 years from final Plan adoption, and projects identified by the Committee to be of “low” local priority may be implemented within 10+ years from final Plan adoptions. However, depending on availability of funding, some proposed mitigation projects may take longer to implement.

The benefit derived from each mitigation practice along with the estimated cost of that practice was utilized to identify the mitigation practices having a high, moderate, or low benefit cost ratio. Preparing detailed benefit cost ratios was beyond the scope of this planning effort and the intent of the MHMP.

The update of this MHMP is a necessary step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in Hancock County. The intent of this planning effort was to identify the hazards and the extent to which they affect Hancock County and to determine what type of mitigation strategies or practices may be undertaken to mitigate for these hazards. A FEMA-approved MHMP is required in order to apply for and/or receive project grants under the HMGP, PDM, FMA, and SRL. FEMA may require a MHMP under the Repetitive Flood Claims (RFC) program. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of these grant programs additional detailed studies may need to be completed prior to applying for these grants. **Section 5.0** of this plan includes an implementation plan for all high priority mitigation practices identified by the Committee.



The CRS program credits NFIP communities a maximum of 72 points for setting goals to reduce the impact of flooding and other known natural hazards; identifying mitigation projects that include activities for prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.



Table 4-1. Proposed Mitigation Practices

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<b>Management of High Hazard Dams</b> 1. Complete IEAP and annual exercise for existing and new high hazard dams 2. Review regular inspection and maintenance records of high hazard dams	<input checked="" type="checkbox"/> Emergency Services <input type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	Ongoing – 2. IDNR receives inspection reports and IEAP updates Proposed Enhancements – 1. Complete IEAP and annual exercise for Sugar Hills Lake Dam 2. Ensure inspections are reported and required improvements and repairs are completed in a timely manner	High	High	Dam Owner EMA IDNR	Existing budget
<b>Geographic Information Systems</b> 1. Update and coordinate GIS layers with location and attributes of critical infrastructure 2. Train GIS staff in HAZUS-MH to quantitatively estimate losses in “what if scenarios” and continue to use the most recent GIS data in land use planning efforts. 3. Update HAZUS-MH Earthquake model with local soil data for more accurate damage estimates	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input type="checkbox"/> Structural Control	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	Ongoing – 1. GIS is used by several communities 2. Some staff are familiar with HAZUS-MH Proposed Enhancement – 1. Coordinate consistent layers county-wide 2. Additional training for GIS staff 3. Update with local information	High (update layers)  Moderate (train, update earthquake model)	High	GIS Departments (County, Greenfield, McCordsville)	Existing Budget

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<p><b>Emergency Preparedness &amp; Warning</b></p> <ol style="list-style-type: none"> <li>1. Improve planning and coordination among event coordinators, facility owners, and emergency response teams</li> <li>2. Implement recommendations of outdoor warning siren study to continue to alert population of severe weather conditions</li> <li>3. Evaluate and utilize flood forecasting capabilities including stream gages, flood forecast maps, and flood alerts</li> <li>4. Require weather radios in all critical infrastructure and encourage use by residents and businesses.</li> <li>5. Improve disaster preparedness and emergency response at the local level through the CERT program</li> <li>6. Increase awareness and participation in the Everbridge/NIXEL or Blackboard Connect notification system</li> <li>7. Coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts.</li> <li>8. Purchase additional mobile electronic messaging boards and develop protocol to provide current hazard information.</li> <li>9. Convey flood height warnings from the USGS river gages in terms the general public can understand</li> <li>10. Investigate the potential to develop a siren fund through payments made during development of subdivisions or industrial/commercial areas</li> <li>11. Install permanent dynamic message board in highly visible area to provide current hazard information</li> </ol>	<p><input checked="" type="checkbox"/> Emergency Services  <input type="checkbox"/> Nat. Res. Protection  <input type="checkbox"/> Prevention  <input checked="" type="checkbox"/> Property Protection  <input checked="" type="checkbox"/> Public Information  <input type="checkbox"/> Structural Control</p>	<p><input checked="" type="checkbox"/> Drought  <input checked="" type="checkbox"/> Earthquake  <input checked="" type="checkbox"/> Extreme Temperature  <input checked="" type="checkbox"/> Flood  <input checked="" type="checkbox"/> Hail/Thunder/Wind  <input checked="" type="checkbox"/> Tornado  <input checked="" type="checkbox"/> Winter Storm/Ice  <input checked="" type="checkbox"/> Dam Failure  <input checked="" type="checkbox"/> HazMat Incident</p>	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Some coordination with event planners</li> <li>2. Outdoor warning siren study completed</li> <li>3. The County has 1 real-time AHP's Stream Gage</li> <li>4. Weather radios are provided during community events</li> <li>5. Some citizens are CERT certified</li> <li>6. NIXEL and Blackboard Connect are utilized</li> <li>8. There are few mobile message boards within the County</li> </ol> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>1. Improve coordination with additional events and large gatherings</li> <li>2. Continue to implement recommendations as funding allows</li> <li>3. Continue to enhance warning system</li> <li>4. Continue to provide weather radios</li> <li>5. Rebuild and enhance the CERT program to have a representative or team in each community</li> <li>6. Increase participation in notification programs</li> <li>7. Coordinate with private business owners and develop list of willing participants</li> <li>8. Purchase additional message boards to increase number to two per community</li> <li>9. Develop information for providing flood height warnings from the USGS to the general public</li> <li>10. Research, propose and adopt an ordinance creating a siren fund</li> <li>11. Coordinate with INDOT to investigate the feasibility of adding a permanent message board</li> </ol>	<p>High                      (Improved planning, sirens, forecasting, weather radios, CERT, notification system, private message boards, mobile message boards)</p> <p>Moderate                      (flood height warnings, additional stream gage)</p> <p>Low                      (siren fund, permanent message boards)</p>	<p>High</p>	<p>EMA                      Red Cross                      Floodplain Administrator (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake)                      Large facility or event coordinators                      Hancock County Surveyor                      INDOT</p>	<p>Existing budgets                      Grants</p>

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<p><b>Public Education &amp; Outreach</b></p> <ol style="list-style-type: none"> <li>1. Post information/warning signs in local parks and other public gathering places explaining what to do in case of a hazard event.</li> <li>2. Provide multi-lingual hazard preparedness literature (warning sirens, radio stations, go-kits, insurance protection, lightning rods, etc.) during Severe Weather Awareness Week, at public facilities and events and to populations within known hazard areas such as floodplains, downstream of a dam, near hazmat facilities, etc. (2007 Measure)</li> <li>3. Develop an education and outreach campaign encouraging residents to keep in contact with their neighbors during hazard events.</li> </ol>	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input type="checkbox"/> Structural Control	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>2. Literature is provided at several public facilities and office locations as well as large public events throughout the County. Populations within the special flood hazard areas are educated through required flood insurance purchases and various website and literature pieces.</li> </ol> <p><b>Proposed Enhancement –</b></p> <ol style="list-style-type: none"> <li>1. Post information in parks and other gathering places</li> <li>2. Encourage the enhancement of the messages provided to various cultural groups and neighborhoods; Educate landowners within the dam inundation areas of the potential dangers and what to do in an emergency situation. Such as encourage voluntary purchase of federally-subsidized flood insurance;</li> <li>3. Formalize a neighborhood or local campaign where community representatives familiar with the culture and language provide residents with emergency information and protocols.</li> </ol>	<p>High (post info, multi-lingual education materials)</p> <p>Low (neighbor campaign)</p>	<p>High</p>	<p>EMA Red Cross Municipal Offices (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake) Parks Departments (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine,)</p>	<p>Existing budget Grant</p>
<p><b>Community Rating System</b></p> <ol style="list-style-type: none"> <li>1. Reduce flood insurance premiums through increased participation or advancement in the NFIP's CRS Program. (2007 Measure)</li> </ol> <p>(Will assist with NFIP compliance)</p>	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Hancock County participates at a Class 8</li> </ol> <p><b>Proposed Enhancement –</b></p> <ol style="list-style-type: none"> <li>1. Increased participation from County and entry from other communities</li> </ol>	<p>High</p>	<p>Moderate</p>	<p>Floodplain Administrator (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake) Event Liaisons</p>	<p>Existing budget Grant</p>
<p><b>Hazardous Materials Response Team</b></p> <ol style="list-style-type: none"> <li>1. Maintain LEPC reporting and training efforts as required through SARA Title III and ensure current facility maps and response plans are on file for Tier II facilities.</li> </ol>	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Records are maintained for most Tier II facilities</li> </ol> <p><b>Proposed Enhancement –</b></p> <ol style="list-style-type: none"> <li>1. Efforts should be strengthened to ensure requirements are met.</li> </ol>	<p>High</p>	<p>Moderate</p>	<p>LEPC EMA Tier II Facility Owners</p>	<p>Existing Budget</p>

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<b>Stormwater Management</b> 1. Minimize impacts of flooding by diverting or retaining stormwater onsite using green infrastructure practices 2. Maintain channels and regulated drains to prevent localized flooding 3. Address flooding in low lying and urban areas due to poor drainage	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input type="checkbox"/> Public Information <input type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	<b>Ongoing –</b> 1. Channels and regulated drains are maintained as funding and staffing allow  <b>Proposed Enhancement –</b> 1. Increase use of green infrastructure as feasible 2. Continue to maintain channels and drains 3. Investigate causes of non-riverine flooding	High	Moderate	Stormwater Department (County, Greenfield, McCordsville)  Hancock County Surveyor  Floodplain Administrators (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake)	Existing Budget  Grant
<b>Transportation</b> 1. Study designated hazardous materials transportation routes and determine if laws are followed 2. Investigate status and prioritize enhancements for warning (flashing lights, crossing arms, rumble strips, signage) at each intersection between rail and road to reduce the potential for train/vehicular crashes	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<b>Ongoing –</b> 1. Routes are well known or marked 2. Many crossings have barriers or warnings  <b>Proposed Enhancement –</b> 1. Improve enforcement 2. Increase number of crossings with barriers or warnings	High	Moderate	County Highway  Municipal Street and/or Utility Departments (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake)	Existing Budget  Grant
<b>Tree Maintenance</b> 1. Maintain trees on public property and right-of-ways and encourage maintenance on private property to reduce the risk of downed utility lines and falling limbs	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input type="checkbox"/> Structural Control	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	<b>Ongoing –</b> 1. Utility providers perform routine maintenance along ROW  <b>Proposed Enhancement –</b> Encourage private landowners to perform maintenance or avoid planting improper trees and shrubs	High	Moderate	County Highway  Municipal Street and/or Utility Departments (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake)	Existing Budget  Power Suppliers

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<p><b>Building Protection</b></p> <ol style="list-style-type: none"> <li>Prohibit the development of new critical infrastructure in 1% &amp; 0.2% annual chance flood hazard and potential dam failure inundation areas. (2007 Measure)</li> <li>Develop reciprocal agreements for structural inspections following hazardous events</li> <li>Relocate, buyout, or floodproof (non-residential) existing non-critical facilities subject to flooding</li> <li>Enforce tie-down and anchoring requirements for roof-mounted HVAC units</li> <li>Protect existing critical facilities in floodplains</li> <li>Encourage new or retrofitted critical facilities to incorporate structural bracing, shutters, laminated/impact-resistant glass and/or interlocking roof coverings to minimize damage</li> <li>Develop an inventory and complete an inspection of public and commercial buildings that may be particularly vulnerable to earthquake damage</li> </ol> <p><i>(Will assist with NFIP compliance)</i></p>	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>Ordinances prohibit construction of new critical facilities within the 0.2% annual chance flood area.</li> </ol> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>Continue to discourage development within floodplains, include potential dam inundation areas.</li> <li>Develop agreements for post-event inspections</li> <li>Inventory and prioritize non-residential facilities for buyout or floodproofing</li> <li>Develop inspection program for roof mounted HVAC units</li> <li>Protect the structures identified in Table 3-10</li> <li>Encourage enhancements for new or retrofitted municipal critical facilities</li> <li>Create an inventory of vulnerable buildings</li> </ol>	<p>High (prohibit development, reciprocal agreements, relocate, tie-downs)</p> <p>Moderate (protect critical facilities, new or retrofitted bracing, building inventory)</p>	<p>Moderate</p>	<p>Building Departments (County, Greenfield) EMA Floodplain Administrator (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Spring Lake) County Surveyor / Drainage Board Facility Owners</p>	<p>Grant Existing budget</p>
<p><b>Land Use Planning &amp; Zoning</b></p> <ol style="list-style-type: none"> <li>Incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plan and Development Review to better guide future growth and development</li> <li>Conduct a Safe Growth Audit of development plans and codes</li> </ol>	<input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Public Information <input checked="" type="checkbox"/> Structural Control	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>Hazard information has been incorporated into some areas of the Comprehensive Land Use Plan</li> </ol> <p><b>Proposed Enhancement –</b></p> <ol style="list-style-type: none"> <li>Increase the number of hazards considered, more definitively outline higher risk areas and those that should be avoided for future development</li> <li>Conduct the audit and implement recommendations</li> </ol>	<p>High (incorporate hazard information)</p> <p>Moderate (growth audit)</p>	<p>Moderate</p>	<p>Planning Departments (County, Cumberland, Greenfield, McCordsville)</p>	<p>Existing Budget</p>

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<p><b>Emergency Response &amp; Recovery</b></p> <ol style="list-style-type: none"> <li>1. Add mobile data terminals to all emergency response vehicles</li> <li>2. Establish procedures to alert and evacuate the population in known hazard areas (Tier II buffers, dam inundation areas)</li> <li>3. Develop and implement a voluntary immunization program for all emergency responders, inspection staff, and families</li> <li>4. Increase number of full time paid positions for fire departments and emergency response teams for responding to HazMat incidents</li> <li>5. Coordinate communications, documentation, and record keeping between NFIP communities and agencies including a database of accurate and community specific information following each hazard event</li> <li>6. Establish procedures to alert and evacuate the populations in known hazard areas (routinely flooded areas)</li> </ol>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Emergency Services</li> <li><input checked="" type="checkbox"/> Nat. Res. Protection</li> <li><input checked="" type="checkbox"/> Prevention</li> <li><input checked="" type="checkbox"/> Property Protection</li> <li><input checked="" type="checkbox"/> Public Information</li> <li><input type="checkbox"/> Structural Control</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Drought</li> <li><input checked="" type="checkbox"/> Earthquake</li> <li><input checked="" type="checkbox"/> Extreme Temperature</li> <li><input checked="" type="checkbox"/> Flood</li> <li><input checked="" type="checkbox"/> Hail/Thunder/Wind</li> <li><input checked="" type="checkbox"/> Tornado</li> <li><input checked="" type="checkbox"/> Winter Storm/Ice</li> <li><input checked="" type="checkbox"/> Dam Failure</li> <li><input checked="" type="checkbox"/> HazMat Incident</li> </ul>	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Many vehicles have terminals</li> </ol> <p><b>Proposed Enhancement –</b></p> <ol style="list-style-type: none"> <li>1. Inventory all response vehicles and purchase terminals as able</li> <li>2. Establish procedures to evacuate areas near Tier II and dams</li> <li>3. Develop a wide-based immunization program</li> <li>4. Increase number of HazMat trained staff</li> <li>5. Coordinate response efforts following each hazard event</li> <li>6. Establish procedures to evacuate routinely flooded areas</li> </ol>	<p>High (terminals, evacuations for Tier II and dams, immunizations, full-time positions)</p> <p>Moderate (coordinate communications)</p> <p>Low (evacuation for flood areas)</p>	<p>Moderate</p>	<p>DHS</p> <p>Sheriff Department</p> <p>Police Department (Cumberland, Fortville, Greenfield, McCordsville, New Palestine)</p> <p>Fire Departments (County, Cumberland, Fortville, Greenfield, McCordsville, New Palestine, Townships, Volunteers)</p> <p>Health Department</p> <p>County Highway</p> <p>Street/ Utility Department (Cumberland, Fortville, Greenfield, McCordsville, New Palestine)</p>	<p>Existing budget</p> <p>Grant</p>



MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT-COST RATIO	RESPONSIBLE ENTITY	FUNDING SOURCE
<p><b>Power Back-Up Generators</b></p> <ol style="list-style-type: none"> <li>Investigate and secure a fuel reserve to ensure critical infrastructure are able to operate on generators for extended periods of time</li> <li>Encourage power back-up generators in all municipal critical facilities</li> <li>Secure funding and purchase additional mobile generators to utilize during or following hazard events</li> <li>Investigate critical facilities to determine whether appropriate wiring exists for a back-up generator</li> <li>Encourage burial of electrical lines in new and redeveloped areas or require designed-failure mode that allows lines to fail or fail in small sections</li> </ol>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Emergency Services</li> <li><input type="checkbox"/> Nat. Res. Protection</li> <li><input checked="" type="checkbox"/> Prevention</li> <li><input checked="" type="checkbox"/> Property Protection</li> <li><input type="checkbox"/> Public Information</li> <li><input type="checkbox"/> Structural Control</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Drought</li> <li><input checked="" type="checkbox"/> Earthquake</li> <li><input checked="" type="checkbox"/> Extreme Temperature</li> <li><input checked="" type="checkbox"/> Flood</li> <li><input checked="" type="checkbox"/> Hail/Thunder/Wind</li> <li><input checked="" type="checkbox"/> Tornado</li> <li><input checked="" type="checkbox"/> Winter Storm/Ice</li> <li><input checked="" type="checkbox"/> Dam Failure</li> <li><input checked="" type="checkbox"/> HazMat Incident</li> </ul>	<p>Ongoing –</p> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>Conduct inventory of generator and fuel capacity</li> <li>Purchase additional mobile generators</li> <li>Determine if appropriate wiring is available at each critical facility</li> <li>Encourage burial of lines for new and re-development</li> </ol>	<p>High (fuel reserve, generators, mobile generators)</p> <p>Low (wiring, burial of lines)</p>	<p>Low</p>	<p>EMA</p>	<p>Existing budget</p>

**CHAPTER 5****IMPLEMENTATION PLAN**

The following is a proposed plan for implementing all high priority mitigation practices identified in this Plan. It should be noted that implementation of each of these proposed practices may involve several preparatory or intermediary steps. However, to maintain clarity, not all preparatory or intermediary steps are included.

**5.1 BUILDING PROTECTION**

Prohibit the development of new critical infrastructure in 1% and 0.2% annual chance flood hazard areas and potential dam failure inundation areas.

- Review current zoning code and determine if amendments need to be made to strengthen the review process for structures in these hazard areas.
- Make any amendments necessary.
- Evaluate proposed development on a case-by-case basis and determine risk for flood damages.
- Suggest flood protection measures for any development allowed in the flood risk areas.

Enforce tie-down and anchoring requirements for roof-mounted HVAC units.

- Review current installation inspection procedures.
- Enhance areas (as needed) to include minimum standards and checkpoints.
- Provide additional inspection procedures to include tie down and anchoring of units
- Provide education materials to facility owners, developers, installers

Develop reciprocal agreements for structural inspections following hazardous events.

- Review existing structural inspection procedures
- Determine staffing and knowledge levels of municipal inspectors
- Develop agreements allowing inspectors from one municipality to conduct structural inspections in another municipality following a hazardous event.

Relocate, buyout, or floodproof (non-residential) existing non-critical infrastructure that are subject to repetitive flooding.

- Prioritize structures subject to repetitive flooding.
- Secure necessary funding for additional acquisition or floodproofing of structures in known hazard areas.
- Partner with building owners to acquire, buyout, or floodproof prioritized structures.

## 5.2 COMMUNITY RATING SYSTEM

Reduce flood insurance premiums through increased participation and advancement in the NFIP's CRS Program.

- Review application and guidance materials and begin gathering supporting documentation.
- Complete application and calculate credits.
- Consult with ISO representative to review application prior to submission.
- Submit application for advancement within the CRS program.
- Maintain and record information as necessary for annual recertification.

## 5.3 EMERGENCY PREPAREDNESS & WARNING

Improve planning and coordination among event coordinators, facility owners, and emergency response teams

- Develop a template Event Response Plan for use by event planners and facility owners
- Coordinate and conduct a meeting with event/planning staff and response agencies to review the template and discuss the needs for communication between the two groups
- Conduct a table-top exercise to practice the implementation of the event response plan
- Adjust the template accordingly and present to additional event planners and facility owners

Implement recommendations of outdoor warning siren study to determine if adequate to alert population of severe weather conditions

- Assess areas not covered by outdoor warning siren audible ranges
- Prioritize areas in need (based on population, location of critical facilities, etc.)

- Secure or appropriate funding and install additional sirens

Evaluate and utilize flood forecasting capabilities including stream gages, flood forecast maps, and flood alerts

- Review existing capabilities and determine areas of need for increased warning time
- Prioritize areas and determine options for increased forecasting abilities
- Secure funding and implement recommendations
- Provide updated information to appropriate response agencies

Require weather radios in all critical infrastructure and encourage use by residents and businesses.

- Develop and propose ordinance language requiring municipally owned critical infrastructure to install and maintain a weather warning system
- Continue to stress the importance of weather radios in all literature, public events, and presentations provided
- Secure funding to purchase weather radios
- Provide weather radios to facilities in need

Improve disaster preparedness and emergency response at the local level through the CERT program

- Identify existing CERT trained residents and areas of coverage
- Determine and prioritize areas uncovered by a CERT representative
- Routinely offer CERT trainings and refreshers

Increase awareness and participation in the Everbridge/NIXEL or Blackboard Connect notification system

- Inform residents of the available system and how to register for participation.
- Develop consistent messages to utilize during various hazard events.
- Investigate multiple systems to allow residents to determine the most appropriate system for them to subscribe.

Coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts.

- Inventory private facilities with dynamic message boards in highly visible areas
- Coordinate with facility owners/operators to determine level of participation
- Develop messages and provide to facility contacts

Purchase additional mobile electronic messaging boards and develop protocol to provide current hazard information.

- Determine number of message boards needed to adequately convey messages for typical hazard events or large public gatherings
- Determine protocol for local emergency agencies to gain access to messaging systems for permanent message boards in the area.
- Distribute additional boards to key locations throughout the county dependent on areas of risk, planned gatherings, or availability of storage space

#### 5.4 EMERGENCY RESPONSE AND RECOVERY

Purchase and install mobile data terminals in all emergency response vehicles

- Inventory emergency response vehicles and status of data terminals
- Prioritize vehicles without data terminals based on frequency of response efforts, existing coverage, etc.
- Secure grant funding or allocate existing funding to purchase additional data terminals

Establish procedures to alert and evacuate the population in known hazard areas (Tier II facility buffers and potential dam inundation areas)

- Determine areas affected by potential hazard events
- Prioritize critical infrastructure evacuation needs
- Develop evacuation routes for each facility within the hazard area
- Coordinate with facility liaison annually to review evacuation routes and procedures

Develop and implement a voluntary immunization program for all emergency responders, inspection staff, and families

- Determine what immunizations are currently offered within each municipality
- Develop a listing of additional immunizations to be offered for municipal employees and family members
- Designate an agency to oversee the program and administer the immunizations

Increase number of full-time paid positions for fire departments and emergency response teams for responding to HazMat incidents

- Assess current staffing of emergency response agencies
- Determine coverage needs and prioritize areas with inadequate coverage
- Secure funding to hire additional staff or train existing staff to better meet the needs

## 5.5 FLOODPLAIN MANAGEMENT

Prioritize and conduct detailed hydraulic analyses of areas with repetitive flooding problems and unnumbered Zone A streams to determine floodplain boundaries.

- Review listing of unstudied streams and floodprone areas.
- Secure funding, municipal bond, or funds from existing budgets to complete floodplain studies.
- Update the Floodplain Prioritization Study to direct future analyses.

Support FEMA approved flood depth mapping (RiskMAP) to better understand the flood risk potential.

- Prioritize areas of greatest potential impact from flooding.
- Review effective floodplain boundaries.
- Secure funding and prepare a depth map to indicate the flood risk potential as a depth of water in affected areas.
- Inform land and property owners of the potential risk to their property and structures.

## 5.6 GEOGRAPHIC INFORMATION SYSTEMS

Update and coordinate GIS layers with location and attributes of critical infrastructure.

- Review current GIS layers and attribute information
- Include additional data as obtained relative to each critical infrastructure

- Coordinate access to layers for each community within the County

### 5.7 HAZARDOUS MATERIALS RESPONSE TEAM

Maintain LEPC reporting and training efforts as required through SARA Title III and ensure current facility maps and response plans are on file for Tier II facilities.

- Ensure reports and training exercises are completed as required.
- Prepare listing of all Tier II facilities within Hancock County.
- Obtain facility maps and response plans

### 5.8 LAND USE PLANNING AND ZONING

Incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plans and development review to better guide future growth and development.

- Draft language and prepare exhibits to incorporate into the appropriate sections of the Hancock County Comprehensive Land Use Plan, individual cities' plans, neighborhood redevelopment plans, etc.
- Adopt amendments as appropriate

### 5.9 MANAGEMENT OF HIGH HAZARD DAMS

Complete an IEAP annual exercise for existing and new high hazard dams.

- Review the IEAP and inundation mapping to better understand the hazard and associated risk
- Prepare the exercise to provide training to appropriate planning and response agencies within the area.
- Partner with the dam owner and IDNR to provide outreach materials to property owners within the inundation area.

Review regular inspection reports and maintenance records of high hazard dams

- Coordinate with high hazard dam owners and IDNR to receive copies of regular inspection reports and maintenance records
- Continue coordination and collaboration to ensure inspections are completed, the dam and surrounding area is maintained, and risks are assessed accordingly

## 5.10 POWER BACK-UP GENERATORS

Inventory presence of generators at critical infrastructure (and fuel capacity)

- Utilize listing of critical infrastructure and coordinate with facility owners or operators
- Determine presence or absence of generator, fuel capacity, and fuel reserve
- Determine if additional needs are required to ensure compatibility with generator (wiring)
- Encourage facility owners to make necessary purchases or facility adjustments for generator

Inventory needs and secure a fuel reserve to ensure critical infrastructure are able to operate on generators for extended periods of time

- Utilize inventory and fuel capacity to determine overall fuel needs
- Coordinate with current municipal fuel providers
- Develop agreements for fuel provisions during and following hazard events

Secure funding and purchase additional mobile generators to utilize during or following hazard events

- Assess current inventory of mobile generators
- Determine needs to better serve the county and communities
- Secure grant funding or allocate budget to purchase needed generators

## 5.11 PUBLIC EDUCATION AND OUTREACH

Post information and/or warning signage in local parks and other public gathering locations explaining outdoor warning sirens and local radio stations that carry emergency information.

- Identify areas where large gatherings may occur
- Prioritize areas identified
- Post information or signage as appropriate for each location

Provide multi-lingual hazard preparedness literature (warning sirens, radio stations, insurance protection, etc.) during Severe Weather Awareness Week, at public facilities and events and to populations within known hazard areas.

- Distribute literature at large public events throughout Hancock County

- Provide literature at all municipal offices as appropriate
- Evaluate additional media outlets and utilize as appropriate (social media, print, billing inserts, etc.)
- Provide targeted materials and messages to at-risk populations

## 5.12 SAFE ROOMS AND COMMUNITY SHELTERS

Inventory areas of need and work to establish safer rooms and community shelters in vulnerable locations (mobile home parks, critical facilities, developments without basements)

- Inventory vulnerable locations or populations without access to a safe room, community shelter, or a safer location
- Prioritize findings based on factors such as number of people, location, or health concerns
- Collaborate with private property owners to establish safer areas in those facilities
- Secure or allocate funding to establish safer areas in public facilities

Develop temporary and/or long term shelter agreements within the County. Potential for tiered levels of shelters, domestic animal shelters, etc.

- Evaluate existing shelter locations
- Determine if additional locations are needed and in which areas
- Coordinate with property owners to develop written procedures for opening shelters

Clearly advertise/announce location of safe rooms and community shelters for large gatherings of people (Football games, 4H Fair, etc.)

- Collaborate with local entities responsible for large outdoor gatherings (sporting events, festivals, etc.)
- Determine location of nearest shelter area and personnel responsible for ensuring the shelter is available during the outdoor event
- Announce or advertise the location of shelter during the event

## 5.13 STORMWATER MANAGEMENT

Minimize the impacts of flooding by diverting or retaining stormwater onsite using green infrastructure practices

- Investigate and prioritize areas prone to flooding

- Determine the feasibility of incorporating green infrastructure practices on an individual site or regional scale
- Encourage landowners to install the practices or to allow a demonstration project on their property

Maintain channels and regulated drains to prevent localized flooding

- Review and assess information from the Surveyor's Office related to areas in need of maintenance
- Prioritize channels and drains based on flooding impacts or potential impacts
- Allocate funding and perform needed maintenance as feasible

Address flooding in low lying and urban areas due to poor drainage

- Assess areas experiencing routine flooding either due to low lying or poor drainage conditions
- Prioritize areas based on flooding impacts or potential impacts
- Allocate funding and implement recommendations as feasible

#### 5.14 TRANSPORTATION

Study designated hazardous materials transportation routes and determine if laws are followed and/or enforced

- Review current designated hazmat routes
- Complete materials flow study for transportation of materials through the County
- Review enforcement procedures and policies
- Determine if changes need to be made for transportation efficiency or for increased penalties for not following established routes

Investigate status and prioritize enhancements for warning (flashing lights, crossing arms, rumble strips, signage) at each intersection between rail and road to reduce the potential for train/vehicular crashes

- Review current crossings and assess for feasibility of enhancing or altering the intersection
- Prioritize crossings and recommendations based on studies
- Collaborate with rail companies and municipal agencies
- Secure or allocate funding and implement recommendations as feasible

## 5.15 TREE MAINTENANCE

Maintain trees on public property and right-of-ways to encourage maintenance on private property to reduce the risk of downed utility lines and falling limbs

- Prioritize areas in need of maintenance (based on number of structures serviced, presence of larger trees, etc.)
- Perform routine preventative maintenance as funding and staffing allow
- Provide “Right Tree, Right Place” educational materials to landowners and residents in areas of above ground power lines

## CHAPTER 6

## PLAN MAINTENANCE PROCESS

## 6.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

**REQUIREMENT §201.6(c)(4)(i):**

*[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

To effectively reduce social, physical, and economic losses in Hancock County, it is important that implementation of this MHMP be monitored, evaluated, and updated. The EMA Director is ultimately responsible for the MHMP. As illustrated in Section 4.2 Mitigation Practices, this Plan contains mitigation program, projects, and policies from multiple departments within each NFIP community. Depending on grant opportunities and fiscal resources, mitigation practices may be implemented independently, by individual NFIP communities, or through local partnerships. Therefore the successful implementation of this MHMP will require the participation and cooperation of the entire Committee to successfully monitor, evaluate, and update the Hancock County MHMP.

The EMA Director will reconvene the MHMP Committee on an annual basis and follow a significant hazard incident to determine whether:

- the nature, magnitude, and/or type of risk have changed
- the current resources are appropriate for implementation
- there are implementation problems, such as technical, political, legal, or coordination issues with other agencies
- the outcomes have occurred as expected
- the agencies and other partners participated as originally proposed

During the annual meetings the Implementation Checklist provided in **Appendix 7** will be helpful to track any progress, successes, and problems experienced.

The data used to prepare this MHMP was based on “best available data” or data that was readily available during the development of this Plan. Because of this, there are limitations to the data. As more accurate data becomes available, updates should be made to the list of critical infrastructure, the risk assessment and vulnerability analysis.

DMA 2000 requires local jurisdictions to update and resubmit their MHMP within 5 years (from the date of FEMA approval) to continue to be eligible for mitigation project grant funding. In early 2021, the EMA Director will once again reconvene the MHMP Committee for a series of meetings designed to replicate the original planning process. Information gathered following individual hazard incidents and annual meetings will be utilized along with updated vulnerability assessments to assess the risks associated with each hazard common in Hancock County. These hazards, and associated mitigation goals and practices will be prioritized and detailed as in Section 3.0 this MHMP. Sections 4.0 and 5.0 will be updated to reflect any practices implemented within the interim as well as any additional practices discussed by the Committee during the update process.

Prior to submission of the updated MHMP, a public meeting will be held to present the information to residents of Hancock County and to provide them an opportunity for review and comment of the draft MHMP. A media release will be issued providing information related to the update, the planning process, and details of the public meeting.

## 6.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

### REQUIREMENT §201.6(c)(4)(ii):

*[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as the comprehensive or capital improvements, when appropriate.*

Many of the mitigation practices identified as part of this planning process are ongoing with some enhancement needed. Where needed, modifications will be proposed to be made to each NFIP communities' planning documents and ordinances during the regularly scheduled update. Among other things, local planning documents and ordinances may include comprehensive plans, floodplain management plans, zoning ordinances, building codes, site development regulations, or permits. Modifications include discussions related to hazardous material facility buffers, floodplain areas, and discouraging development of new critical infrastructure in known hazard areas.

Based on added language within each of the Comprehensive Plan updates the appropriate Zoning Ordinances and Floodplain Management Ordinances within each community would also need to be amended.

### 6.3 CONTINUED PUBLIC INVOLVEMENT

**REQUIREMENT §201.6(c)(4)(iii):**

*[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance*

Continued public involvement is critical to the successful implementation of the Hancock County MHMP. Comments gathered from the public on the MHMP will be received by the EMA Director and forwarded to the MHMP Committee for discussion. Education efforts for hazard mitigation will be the focus of the annual Severe Weather Awareness Week as well as incorporated into existing stormwater planning, land use planning, and special projects/studies efforts. Once adopted, a copy of this Plan will be available for the public to review in the EMA Office and the Hancock County website.

Updates or modifications to the Hancock County MHMP will require a public notice and/or meeting prior to submitting revisions to the individual jurisdictions for approval.

The CRS program credits NFIP communities a maximum of 37 points for adopting the Plan; establishing a procedure for implementation, review, and updating the Plan; and submitting an annual evaluation report.



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**APPENDIX 1**

**List of Acronyms**

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AHPS	Advanced Hydrologic Prediction Service
AICP	American Institute of Certified Planners
CBBEL	Christopher B. Burke Engineering, LLC
CERT	Community Emergency Response Team
CFM	Certified Floodplain Manager
CPRI	Calculated Priority Risk Index
CRS	Community Rating System
DFIRMs	Digital Flood Insurance Rate Maps
DHS	Department of Homeland Security (US)
DMA	Disaster Mitigation Act
EHS	Extremely Hazardous Substance
EMA	Emergency Management Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Act
GDP	Gross Domestic Product
GIS	Geographic Information System
HAZUS-MH	Hazard US – Multi-Hazard
HIRA	Hazard Identification and Risk Assessment
HMGP	Hazard Mitigation Grant Program
HMRT	Hazardous Materials Response Team
HUC	Hydrologic Unit Code
IDEM	Indiana Department of Environmental Management

IDHS	Indiana Department of Homeland Security
IDNR	Indiana Department of Natural Resources
INAFSM	Indiana Association of Floodplain and Stormwater Managers
LEPC	Local Emergency Planning Commission
MHMP	Multi-Hazard Mitigation Plan
MPH	Miles Per Hour
MRCC	Midwestern Regional Climate Center
MSDS	Material Safety Data Sheet
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NOAA	National Oceanic Atmospheric Administration
NRCS	National Resource Conservation Service
NWS	National Weather Service
OSHA	Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation
RFC	Repetitive Flood Claims
SARA	Superfund Amendment Reauthorization Act
SFHA	Special Flood Hazard Area
SRL	Severe Repetitive Loss
USDA	United States Department of Agriculture
USGS	United States Geological Service
WCT	Wind Chill Temperature

**APPENDIX 2**

**Committee  
Summaries**

**Meeting**

**Agendas**

**and**

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**Hancock County Multi-Hazard Mitigation Plan Update  
Project Team Meeting**

9 am Thursday, July 23, 2015  
Hancock Regional Hospital Meeting Room  
801 N State Street, Greenfield, IN 46140

**AGENDA**

1. Welcome and Introductions
2. Approach for the MHMP Update/Meeting Purpose
3. Hazard Risk Assessment:
  - a) Review Hazard Data
  - b) Discuss Vulnerability to Hazards
  - c) Determine Probability & Severity
4. Critical Infrastructure
5. Next Steps
6. Adjournment

## Hancock County Multi-Hazard Mitigation Plan Update

### Project Team Meeting

9 am Thursday, July 23, 2015  
Hancock Regional Hospital Meeting Room  
801 N State Street, Greenfield, IN 46140

### SUMMARY

#### **Project Team Members Present:**

Dede Allender, Hancock County Solid Waste  
Roy Ballard, Hancock County-Purdue University Extension  
John Begovich, Sugar Creek Fire Department  
Tracie Belongia, Hancock County Surveyor's Office  
George Boaz, Hancock County EMA  
Susan Bodkin, Hancock County Surveyor  
Jeff Conley, Ninestar  
Lori Cooley, Hancock Regional Hospital  
Michael Crider, Indiana Senator  
Ron Crider, Town of McCordsville Public Works  
Mike Dale, Hancock County Planning Department  
Martin Ebbert, Town of Shirley Maintenance  
Ben Esterline, IDHS  
Joannie Fitzwater, City of Greenfield Planning Department  
Michael Fruth, City of Greenfield Utilities  
Chelly Gracy, Hancock County GIS  
Joe Hollis, Hancock County Transportation  
▶ Terr Hulen, Sugar Creek Fire Department  
John Jester, City of Greenfield Police  
Matt Kelly, Hancock County 911  
Bill Knauer, Town of Fortville Police  
John Milburn, Hancock County GIS  
Misty Moore, Hancock County EMA  
Christine Owens, Town of Cumberland  
Jim Peters, Salvation Army  
George Plinsinski, Ninestar  
Joe Renner, Town of Fortville  
Jimmy Roberts, City of Greenfield Fire Department  
Mike Shepherd, Hancock County Sheriff  
Dave Sutherin, Hancock County Mutual Aid  
Scott Williams, Hancock County Building Department  
Steve Yagelski, Town of Cumberland Utilities

**Others Present:**

Heather Buck, CBBEL

**1. Welcome and Introductions**

Heather and Susan thanked everyone for attending the meeting and asked those present to introduce themselves.

**2. Approach for the MHMP Update/Meeting Purpose**

Heather explained to the group that the MHMP Update is a requirement to be completed every 5 years. The overall approach, utilizing a larger Planning Committee similar to the previous approach was described. The meetings will follow steps to reach the end result of an updated MHMP for all NFIP Communities within Hancock County.

**3. Hazard Risk Assessment:**

a) Review Hazard Data

The Committee reviewed the hazards to be studied as determined by Hancock County Surveyor's Office and agreed that these are the hazards which most affect Hancock County. Heather shared data that CBBEL had gathered from the Nation Climatic Data Center (NCDC), local media outlets, and various agencies and offices since the 2007 MHMP was completed.

b) Discuss Vulnerability to Hazards

The Committee was engaged during the discussion regarding the hazards, specific events, and damages experienced. This information will be utilized to guide additional data collection for the MHMP Update, as well as enhance the discussion with the Planning Committee.

c) Determine Probability & Severity

The Committee, considering the data collected, their knowledge, and the prior discussions, determined the probability and severity of the hazards considered during this planning effort. This information will be utilized to determine the Calculated Priority Risk Index (CPRI) and will be reviewed by the Planning Committee.

**4. Critical Infrastructure**

Heather explained that the listing of Critical Infrastructure will be provided by the Hancock County GIS Department, categorized into sectors, and will be mapped and utilized to perform additional data analyses to prepare "what-if" scenarios.

**5. Next Steps**

The process was further explained to the Committee to include the next meeting, a Public Meeting, and submission of the draft report for all Committee members, the public, and FEMA's review and comment. It was also explained that it will be very important that all Committee members provide their information in a timely manner so that the draft MHMP Update can be prepared.

**6. Adjournment**

The Committee adjourned and plans to meet again following gathering of additional data and information. Announcements will be sent to all in attendance and those on the list provided by the Hancock County Surveyor's Office.

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## **Hancock County Multi-Hazard Mitigation Plan Update**

### **Project Team Meeting #2**

9 am Thursday, November 19, 2015  
Hancock Regional Hospital Meeting Room  
801 N State Street, Greenfield, IN 46140

### **AGENDA**

1. Welcome and Introductions
2. Review of the approach for the MHMP Update
3. Review the Hazard Risk Assessment/CPRI
4. Review and Prioritize Proposed Mitigation Measures
5. Next Steps
6. Adjournment

## Hancock County Multi-Hazard Mitigation Plan Update

### Project Team Meeting #2

9 am Thursday, November 19, 2015  
Hancock Regional Hospital Meeting Room  
801 N State Street, Greenfield, IN 46140

### SUMMARY

#### **Project Team Members Present:**

Robert Allen, Sugar Creek Fire Department  
Roy Ballard, Hancock County-Purdue University Extension  
John Begovich, Sugar Creek Fire Department  
Tracie Belongia, Hancock County Surveyor's Office  
George Boaz, Hancock County EMA  
Susan Bodkin, Hancock County Surveyor  
Dennis Cutteridge, Keihin  
Martin Ebbert, Town of Shirley Maintenance  
Robert Ehle, Town of New Palestine  
Joannie Fitzwater, City of Greenfield Planning Department  
Michael Fruth, City of Greenfield Utilities  
Chelly Gracy, Hancock County GIS  
David Heiniger, Hancock Regional Hospital  
Matt Kelly, Hancock County 911  
Bill Knauer, Town of Fortville Police  
Ben Lipps, Town of Cumberland  
John Milburn, Hancock County GIS  
Misty Moore, Hancock County EMA  
Joe Munden, City of Greenfield Police Department  
Rudy Nylund, Hancock County Coroner's Office  
Joe Renner, Town of Fortville  
Jimmy Roberts, City of Greenfield Fire Department  
Dave Sutherin, Hancock County Mutual Aid  
Teri Sweet, Hancock County Plan Commission  
Karla Vincent, City of Greenfield Engineering  
Brent Wakeland, Hancock County Health Department  
Scott Williams, Hancock County Building Department

#### **Others Present:**

Heather Buck, CBBEL

#### **1. Welcome and Introductions**

Heather and Susan thanked everyone for attending the meeting. Introductions were made by those present.

**2. Review of the Approach for the MHMP Update**

A brief review was provided for those committee members not present at the first meeting.

**3. Review the Hazard Risk Assessment/CPRI**

The results of the completed CPRI were shared with those present. Utilizing the discussion from the previous Committee meeting, the "draft" CPRI was presented. Adjustments were made based on additional discussion with the Committee once they were able to see the final prioritizations.

**4. Review and Prioritize Proposed Mitigation Practices**

Utilizing the mitigation practices described in the 2007 MHMP and information gathered through the planning process, a list of proposed mitigation practices was presented to the Committee for review and comment. Due to time constraints, the Committee was unable to finish the exercise. An additional meeting will be scheduled to complete the ranking and discussion.

**5. Next Steps & Future Meetings**

It was explained that the next step in the process is to prepare the draft MHMP Update. Once this has been completed, a public meeting will be held and the draft will be submitted to FEMA and IDHS for review and comment.

**6. Adjournment**

The Committee adjourned

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**APPENDIX 3**

**PUBLIC PARTICIPATION AND INVOLVMENT  
OF OTHER INTERESTED PARTIES**

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**APPENDIX 4**

**Critical Infrastructure by NFIP Community**

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Map ID	Agriculture and Food	NFIP
AF01	Crop Production Services	Hancock County
AF02	Harvest Land Cooperative	Hancock County
AF03	Harvest Land Cooperative Inc	Hancock County
AF04	Harvest Land Cooperative Inc Buck Creek Agricultural Center	Hancock County
AF05	Harvest Land Cooperative Junction Ag Center & Petroleum	Hancock County
AF06	Hoosier Propane 11573	Hancock County
AF07	Kenneth Butler Memorial Soup Kitchen	Greenfield

Map ID	Banking and Finance	NFIP
BF01	Ameriana Savings Bank	Greenfield
BF02	Ameriana Savings Bank	McCordsville
BF03	Chase Bank	Greenfield
BF04	Family Horizon Credit Union	Greenfield
BF05	Fifth Third Bank	Hancock County
BF06	Greenfield Banking Company	Greenfield
BF07	Greenfield Banking Company	Fortville
BF08	Greenfield Banking Company	Cumberland
BF09	Greenfield Banking Company	Greenfield
BF10	Greenfield Banking Company	Greenfield
BF11	Greenfield Banking Company	Hancock County
BF12	Greenfield Banking Company	McCordsville
BF13	PNC Bank	Greenfield
BF14	PNC Bank	McCordsville
BF15	Star Financial Bank	Greenfield
BF16	Union Bank and Trust	Fortville
BF17	Union Savings and Loan	Greenfield

Map ID	Church	NFIP
CH01	Amity United Methodist Church	Hancock County
CH02	Apostolic Pentecostal Church	Greenfield
CH03	Bethel Baptist Church	Greenfield
CH04	Body Of Christ	Hancock County
CH05	Bradley United Methodist Church	Greenfield
CH06	Brandywine Community Church Inc	Greenfield
CH07	Bridge Church	Fortville
CH08	Bridge Church	Fortville
CH09	Broadway Baptist Church	Greenfield
CH10	Brookville Road Community Church	Hancock County
CH11	By His Grace Ministry Inc	Hancock County
CH12	Calvary Ch Of Bible Covenant,	Hancock County
CH13	Carrollton United Methodist Church Inc	Hancock County
CH14	Charlottesville United Methodist Church	Hancock County
CH15	Christ Presbyterian Church Of Indianapolis	McCordsville
CH16	Church Of God	Hancock County

Map ID	Church	NFIP
CH17	Community Christian Church	Hancock County
CH18	Cross Of Grace Lutheran Church	Hancock County
CH19	Curry'S Chapel U M Church	Hancock County
CH20	Eastern Indiana Holiness Association	Hancock County
CH21	Eastview Christian Fellowship	Hancock County
CH22	Eden United Methodist Church & Cemetery	Hancock County
CH23	Faith Apostolic Church	Greenfield
CH24	Faith Lutheran Church Of Greenfield Indiana	Greenfield
CH25	First Assembly Of God Of Greenfield	Hancock County
CH26	First Church Of God	Greenfield
CH27	First Church Of God	Greenfield
CH28	Fortville Christian Church Trustees	Hancock County
CH29	Fortville First United Methodist Church	Fortville
CH30	Friends Church	Hancock County
CH31	Friends Church	Hancock County
CH32	Grace Baptist Church	Hancock County
CH33	Grace, Baptist Church	Fortville
CH34	Greater Grace Of Central Indiana	Greenfield
CH35	Greenfield Christian Church	Greenfield
CH36	Greenfield Church Of Bible Covenant	Greenfield
CH37	Greenfield Church Of Christ	Greenfield
CH39	Greenfield Faith United Methodist Church	Greenfield
CH40	Greenfield Friends Church	Greenfield
CH41	Greenfield Indiana Congregation Of Jehovah'S Wittnesses	Hancock County
CH42	Greenfield Wesleyan Church	Greenfield
CH43	Hancock Baptist Temple	Hancock County
CH44	Highest Praise Worship Center Inc	Greenfield
CH45	Indiana Association of 7th Day Adventist	Hancock County
CH46	International Conservative Holiness Association Inc	Hancock County
CH47	Macedonia Missionry Baptist Church	Hancock County
CH48	Mccordsville United Methodist Church	McCordsville
CH49	Mohawk United Methodist Church	Hancock County
CH50	Mt Carmel Primitive Baptist Church	Hancock County
CH51	Mt Lebanon Church and Cemetery	Hancock County
CH52	Nameless Creek Christian Church	Hancock County
CH53	Nazarene Church	Hancock County
CH54	New Home Church	Hancock County
CH55	New Palestine Bible Church	New Palestine
CH56	New Palestine Christian Church	Hancock County
CH57	New Palestine Church Of Christ	Hancock County
CH58	New Palestine United Church	New Palestine
CH59	Northside Christian Church	Greenfield
CH60	Otterbein United Methodist	Hancock County
CH61	Park Chapel Christian Church	Greenfield

Map ID	Church	NFIP
CH62	Philadelphia U M Church	Hancock County
CH63	Presbyterian Church	Greenfield
CH64	Raymond Park Congregation Of Jehovah's Witness	Hancock County
CH65	Roman Catholic Archdiocese Of Indpls Properties	Greenfield
CH66	Roman Catholic Archdiocese Of Indpls Properties	Fortville
CH67	Shiloh Christian Church	Hancock County
CH68	Shirley Christian Church	Hancock County
CH69	Shirley United Methodist Church	Hancock County
CH70	St. James Evangelical Luthern Church Of Gfld	Greenfield
CH71	Stringtown Church Of Nazarene	Hancock County
CH72	Trinity Park United Methodist Church	Greenfield
CH73	Victory Independent Baptist Church	Hancock County
CH74	Warrington Com Free Will Baptist	Hancock County
CH75	Wilkinson Church Of Christ	Hancock County
CH76	Willow Branch United Methodist Church	Hancock County
CH77	Woodbury Community Church	Hancock County

Map ID	Commercial	NFIP
CL01	Act III Mobile Home Park	Hancock County
CL02	Apartments	Greenfield
CL03	Apartments	Greenfield
CL04	Arrowhead Mobile Home Park	Hancock County
CL05	Bluestone Apartments	Greenfield
CL06	Cedar Knoll Apartments	Greenfield
CL07	CLM Pallet	Fortville
CL08	Comfort Inn	Greenfield
CL09	Conservation Club	Hancock County
CL10	Country Inn and Suites	Greenfield
CL11	Countryside Apartments	Hancock County
CL12	Daily Reporter	Greenfield
CL13	East Forty Mobile Home Park	Hancock County
CL14	Eastway Court Apartments	Hancock County
CL15	Fortville-Vernon Library	Fortville
CL16	Fortville Boys and Girls Club	Fortville
CL17	Gateway Crossing Apartments	McCordsville
CL18	Good Shepard Community Apartments	Greenfield
CL19	Greenfield Boys and Girls Club	Greenfield
CL20	Greenfield Crossing Apartments	Greenfield
CL21	Greenfield Public Library	Greenfield
CL22	Greenfield Village Apartments	Greenfield
CL23	Hampton Inn	Greenfield
CL24	Heartland Campgrounds	Hancock County
CL25	Home Depot 2026	Greenfield
CL26	Jackson Oil And Solvents	Greenfield

Map ID	Commercial	NFIP
CL27	Jefferson Place Apartments	Fortville
CL28	KOA Campground	Hancock County
CL29	Mohawk Campgrounds	Hancock County
CL30	Paul Akers Incorporated	Hancock County
CL31	Quality Inn and Suites	Greenfield
CL32	Ridgeview Apartments	Fortville
CL33	S & H Campground	Hancock County
CL34	Sams Club Distribution Center	Greenfield
CL35	Stonecrest Apartments	Fortville
CL36	Sugar Creek Public Library	New Palestine
CL37	Sugar Creek Village Apartments	New Palestine
CL38	Super 8	Greenfield
CL39	Village Apartments of Fortville	Fortville
CL40	Walls Villa Apartments	Hancock County
CL41	Walmart Return Center Exel 9193	Hancock County
CL42	Washington Village Apartments	Hancock County

Map ID	Critical Manufacturing	NFIP
CM01	Avery Dennison	Greenfield
CM02	Caterpillar Logistics Services	Hancock County
CM03	Covance Laboratories Incorporated	Hancock County
CM04	CVS 86050	Hancock County
CM05	Elanco Animal Health Global Headquarters	Greenfield
CM06	Holloway House	Fortville
CM07	Indiana Automotive Fasteners Inc	Greenfield
CM08	Irving Materials Incorporated	Hancock County
CM09	Keihin LPT Manufacturing Inc	Greenfield
CM10	Rinker Materials	Hancock County
CM11	Roll Coater (Precoat Metals)	Greenfield
CM12	Stanley Black & Decker	Hancock County
CM13	Stanley Black & Decker	Greenfield
CM14	Vivolac Cultures Corporation	Hancock County

Map ID	Communications	NFIP
N01	Substation	Elkhart (City)
N02	Substation	Elkhart (County)
N03	Substation	Elkhart (County)
N04	Substation	Elkhart (County)
N05	Substation	Elkhart (City)
N06	Substation	Elkhart (County)
N07	Substation	Elkhart (County)
N08	Substation	Elkhart (County)
N09	Substation	Elkhart (County)
N10	Substation	Elkhart (County)

Map ID	Communications	NFIP
CN01	AT&T	Fortville
CN02	AT&T Indiana Telephone	Greenfield
CN03	AT&T Indiana Telephone	Greenfield
CN04	AT&T Indiana Telephone	New Palestine
CN05	Bill Applegate	Greenfield
CN06	Cell Tower	Hancock County
CN07	Cell Tower	Hancock County
CN08	Cell Tower	Hancock County
CN09	Cell Tower	Hancock County
CN10	Cell Tower	Hancock County
CN11	Cell Tower	Hancock County
CN12	Cell Tower	Hancock County
CN13	Cell Tower	Hancock County
CN14	Cell Tower	Hancock County
CN15	Cell Tower	Hancock County
CN16	Cell Tower	Hancock County
CN17	Cell Tower	Hancock County
CN18	Cell Tower	Hancock County
CN19	Cell Tower	Hancock County
CN20	Cell Tower	Hancock County
CN21	Cell Tower	New Palestine
CN22	Cell Tower	New Palestine
CN23	Cell Tower	Hancock County
CN24	Cell Tower	Greenfield
CN25	Cell Tower	Greenfield
CN26	Cell Tower	Hancock County
CN27	Cell Tower	Hancock County
CN28	Cell Tower	Hancock County
CN29	Cell Tower	Hancock County
CN30	Cell Tower	Hancock County
CN31	Cell Tower	Hancock County
CN32	Cell Tower	Hancock County
CN33	Communications	McCordsville
CN34	Communications	Hancock County
CN35	Communications	McCordsville
CN36	Communications	McCordsville
CN37	Communications	Hancock County
CN38	Communications	Hancock County
CN39	Communications	Hancock County
CN40	Communications	Hancock County
CN41	Communications	Hancock County
CN42	Global Tower	Hancock County
CN43	Hancock County EOC	Greenfield
CN44	Indianapolis Airport Authority	Hancock County

Map ID	Communications	NFIP
CN45	MCI PLVWIN	Hancock County
CN46	Mobilitie Investments II	Hancock County
CN47	Mobilitie Investments II	Hancock County
CN48	New Cingular Wireless PCS	Greenfield
CN49	New Cingular Wireless PCS	McCordsville
CN50	Spectrasite Comm Inc Through American Towers	Hancock County
CN51	Star Five	McCordsville
CN52	Stc Five	Hancock County
CN53	T-Mobile Central	Hancock County
CN54	T-Mobile Central (F/K/A Voicestream PCS I)	Hancock County
CN55	T-Mobile Central (F/K/A Voicestreem PCS I)	Hancock County
CN56	Towerco Assests	Hancock County
CN57	Town Of Mt Comfort	Hancock County
CN58	United Telephone Company Indiana DBA Century Link Wilkinson Company	Hancock County
CN59	United Telephone Company Indiana DBA Centurylink	Fortville

Map ID	Dams	NFIP
DA01	Baker Dam	Hancock County
DA02	Hallenbaugh Lake Dam	Hancock County
DA03	Muegge Lake Dam	Hancock County
DA04	Spring Lake Dam	Spring Lake
DA05	Sugar Hills Lake Dam	Hancock County
DA06	Valley Brook Farms Lake Dam	Cumberland

Map ID	Defense Industrial Base	NFIP
DB01	Armory	Greenfield

Map ID	Daycare	NFIP
DC01	Active Tots Daycare	Greenfield
DC02	Angela Day Childcare	Hancock County
DC03	April's Daycare	Hancock County
DC04	Bailey Angels Daycare	Hancock County
DC05	Betty Mom's Home Daycare	Hancock County
DC06	Brighter Beginnings Childcare	Hancock County
DC07	Browns Chapel Church	Hancock County
DC08	Calvary Southern Baptist Church Of Gfld	Greenfield
DC09	Christina's Kids	Hancock County
DC10	Creative Child & Kids Care	Hancock County
DC11	Debra J Neice Daycare	Greenfield
DC12	Discovery House	Fortville
DC13	Eunice Austin Daycare	Greenfield
DC14	First Baptist Church	Greenfield
DC15	Geist Community Baptist Church	McCordsville
DC16	Ginger's Childcare	Fortville

DC17	Greenfield First Church Of The Nazarene	Greenfield
DC18	House Of Kids II	Greenfield
DC19	Jans Tykes And Trykes	Greenfield
DC20	Kids Clubhouse Childcare	Greenfield
DC21	Kids Corner Daycare	Hancock County
DC22	Lil Punkin Patch Daycare	Greenfield
DC23	Lila A Keen's Family Day Home	Hancock County
DC24	Little Bear Daycare	Hancock County
DC25	Lollipop Stop/Mount Comfort	Hancock County
DC26	Lucky's Daycare	Greenfield
DC27	Lucky's Daycare	Greenfield
DC28	Marva Brown Daycare	Hancock County
DC29	Mt Comfort Methodist Church	Hancock County
DC30	Nanny's Daycare	Greenfield
DC31	New Life Christian Fellowship	Hancock County
DC32	New Palestine United Methodist Church	New Palestine
DC33	No Place Like Home Learning Center	Greenfield
DC34	Oaklandon Christian Church	Hancock County
DC35	Pam's Daycare	Hancock County
DC36	Patrice Shannon Daycare	Hancock County
DC37	Promises And Possibilities II	McCordsville
DC38	Rainbow Daycare Inc	Greenfield
DC39	Sally Loutt Daycare	Hancock County
DC40	Shannon Jones Daycare	Greenfield
DC41	Sharon Moore Daycare	Hancock County
DC42	Shelley's Daycare	Greenfield
DC43	Shining Stars Child Care Academy	Greenfield
DC44	Sunrise Daycare	Fortville
DC45	Sweet Beginnings Daycare	McCordsville
DC46	Sylvia Austin	McCordsville
DC47	The Exploration Room	McCordsville
DC48	The Playroom	Hancock County
DC49	The Treehouse Family Childcare	McCordsville
DC50	TLC	Greenfield
DC51	Tonya's Daycare	Greenfield

Map ID	Energy	NFIP
EN01	Ag One Co Op	Greenfield
EN02	Casey's	Greenfield
EN03	Circle K	Greenfield
EN04	Crystal Flash	Greenfield
EN05	Electric	Fortville
EN06	Electric	Hancock County
EN07	Electric	Hancock County
EN08	Electric	Hancock County

Map ID	Energy	NFIP
EN09	Electric	Hancock County
EN10	Electric	Hancock County
EN11	Electric	New Palestine
EN12	Electric	Hancock County
EN13	Electric	Hancock County
EN14	Electric	Hancock County
EN15	Gas	New Palestine
EN16	Gas	Fortville
EN17	Gas	Fortville
EN18	Gas	Hancock County
EN19	Gas	Hancock County
EN20	Gas	Hancock County
EN21	Gas	Hancock County
EN22	Gas	Greenfield
EN23	Gas	Hancock County
EN24	Gas	Hancock County
EN25	Gas	Greenfield
EN26	Hucks	Fortville
EN27	Kocolene	Greenfield
EN28	Mac's Convenience Store	Hancock County
EN29	Murphy Oil	Greenfield
EN30	NineStar Connect	Greenfield
EN31	NineStar Connect	Hancock County
EN32	Pilot Travel Center 030	Hancock County
EN33	Pipeline	Hancock County
EN34	Speedway	Hancock County
EN35	Speedway	Hancock County
EN36	Speedway	Greenfield
EN37	Speedway 8042	Fortville
EN38	Speedway 8045	Greenfield
EN39	Speedway 8046	Greenfield
EN40	Speedway 8047	Greenfield
EN41	Speedway 8048	Hancock County
EN42	Speedway 8049	Greenfield
EN43	Speedway 8050	Hancock County
EN44	Speedway 8067	McCordsville
EN45	Speedway 8070	New Palestine
EN46	Spring Lake Community Center	Spring Lake
EN47	Swiftly Oil Service Station 219	Greenfield
EN48	Village Pantry	McCordsville
EN49	Village Pantry	Greenfield

Map ID	Emergency Services	NFIP
ES01	Buck Creek Township FD Station 71	Hancock County

ES02	Buck Creek Township FD Station 72	Hancock County
ES03	Fortville FD Station 3	Fortville
ES04	Fortville Police Department	Fortville
ES05	Green Township FD Station 15	Hancock County
ES06	Greenfield FD Station 21	Greenfield
ES07	Greenfield FD Station 22	Greenfield
ES08	Greenfield Police Department	Greenfield
ES09	Hancock County Sheriffs Department	Greenfield
ES10	Jackson Township FD Station 6	Hancock County
ES11	Mccordsville FD Station 8	McCordsville
ES12	McCordsville Police Department	McCordsville
ES13	Shirley FD Station 11	Hancock County
ES14	Sugar Creek Township FD Station 42	Hancock County
ES15	Sugar Creek Township FD Station 45	Hancock County
ES16	Wilkinson Township FD Station 9	Hancock County

Map ID	Government	NFIP
GV01	City of Greenfield Government Center	Greenfield
GV02	Fortville Town Hall	Fortville
GV03	Hancock County Animal Control	Greenfield
GV04	Hancock County Courthouse	Greenfield
GV05	Hancock County Courthouse Annex	Greenfield
GV06	Hancock County Jail	Greenfield
GV07	Hancock Family and Child	Greenfield
GV08	INDOT Greenfield Sub District	Greenfield
GV09	McCordsville Government Offices	McCordsville
GV10	New Palestine Town Hall	New Palestine
GV11	Shirley Town Hall	Hancock County
GV12	Wilkinson Town Hall	Hancock County

Map ID	Healthcare and Public Health	NFIP
HC01	American Health Network	Greenfield
HC02	ATI Physical Therapy	Greenfield
HC03	Bardonner	Greenfield
HC04	Bell Professional Mortuary Service	Hancock County
HC05	Brandywine Animal Hospital	Greenfield
HC06	Condo Funeral Home	Hancock County
HC07	CVS Pharmacy	New Palestine
HC08	CVS Pharmacy	Greenfield
HC09	CVS Pharmacy	McCordsville
HC10	CVS Pharmacy	Fortville
HC11	Dentist	Cumberland
HC12	Erlewein Funeral Home	Fortville
HC13	Erlewein Funeral Home	Hancock County
HC14	Eye Surgeons of Indiana	Greenfield

HC15	Fletcher Dental	Greenfield
HC16	Fortville Family Dentistry	Fortville
HC17	Golden Living Center Brandywine	Greenfield
HC18	Greenfield Chiropratic Center	Greenfield
HC19	Greenfield Dental Arts	Greenfield
HC20	Greenfield First Care	Greenfield
HC21	Greenfield Veterinary Clinic	Greenfield
HC22	Hancock Eye Associates	Greenfield
HC23	Hancock Memorial Hospital	Greenfield
HC24	Hancock Regional Medical Center	McCordsville
HC25	Hendryx Mortuaries	New Palestine
HC26	Kaminski	Greenfield
HC27	Kirkwood	Greenfield
HC28	Kroger Pharmacy	Greenfield
HC29	Lesley & Georgia DDS	Greenfield
HC30	McCordsville Veterinary Hospital	McCordsville
HC31	Medicap Pharmacy	Greenfield
HC32	Mt Comfort Animal Hospital	Hancock County
HC33	New Palestine Chiropractic	Hancock County
HC34	New Palestine Family Medicine	Hancock County
HC35	New Palestine Gentle Dentist	Hancock County
HC36	New Palestine Veterinary Clinic	New Palestine
HC37	Pleasant View Lodge	Hancock County
HC38	Regency Place	Greenfield
HC39	Seals Funeral Home	Fortville
HC40	Springhurst	Greenfield
HC41	Stillinger Funeral Home	Greenfield
HC42	Sugar Creek Animal Hospital	Hancock County
HC43	Sugar Creek Chateau	Hancock County
HC44	Torok Family Chiropratic	Greenfield
HC45	Travis B Bunnell PC	Fortville
HC46	Walgreens Pharmacy	Greenfield
HC47	Walmart Pharmacy	Greenfield
HC48	Wilson	Greenfield

Map ID	Schools	NFIP
SC01	Brandywine Elementary	Hancock County
SC02	Brandywine Preschool	Greenfield
SC03	Central High School	Greenfield
SC04	Doe Creek Middle School	Hancock County
SC05	Eastern Hancock School	Hancock County
SC06	Eden Elementary	Hancock County
SC07	Fortville Church Of Nazarene	Fortville
SC08	Geist Orchard CO-Op Preschool	McCordsville
SC09	Greenfield Community School Corp Admin	Greenfield

Map ID	Schools	NFIP
SC10	Greenfield Middle School	Greenfield
SC11	Greenfield Middle School	Greenfield
SC12	Hancock-S Madison Srvs School	Greenfield
SC13	Harris Elementary	Greenfield
SC14	JB Stevens Elementary School	Greenfield
SC15	Maxwell Middle School	Hancock County
SC16	Maxwell Middle School	Hancock County
SC17	Mccordsville Elementary School	McCordsville
SC18	Mount Comfort Elementary	Hancock County
SC19	Mount Vernon Middle And High Schools	Fortville
SC20	Mt Vernon Elementary-YMCA Greater Indy	Fortville
SC21	New Palestine Elementery School	New Palestine
SC22	New Palestine Elementery School	New Palestine
SC23	New Palestine Elementery School	New Palestine
SC24	New Palestine High School	New Palestine
SC25	St Michael Elementary School	Greenfield
SC26	Sugar Creek Elementary School	Hancock County
SC27	Weston Elementary School	Greenfield
SC28	Zion Evangelical Lutheran Church	Hancock County
SC29	Zion Lutheran School	Hancock County

Map ID	Transportation Systems	NFIP
TS01	Boatland	Hancock County
TS02	Hepler Trucking	Hancock County
TS03	Indianapolis Regional Airport (storage)	Hancock County
TS04	Indianapolis Regional Airport (terminal)	Hancock County
TS05	Truck Terminal	Hancock County

Map ID	Water	NFIP
WA01	Doe Creek Sewer Utility	Hancock County
WA02	Fortville Waterworks	Fortville
WA03	Greenfield Utilities	Greenfield
WA04	Greenfield Utilities	Greenfield
WA05	Greenfield Wastewater Treatment	Greenfield
WA06	McCordsville Wastewater	McCordsville
WA07	New Palestine	New Palestine
WA08	Town of Fortville Park and Sewage	Fortville
WA09	Water Tower (Citizens)	McCordsville
WA10	Water Tower (Citizens)	Hancock County
WA11	Water Tower (Citizens)	McCordsville
WA12	Water Tower (Cumberland)	Hancock County
WA13	Water Tower (Fortville)	Fortville
WA14	Water Tower (Fortville)	Fortville
WA15	Water Tower (Greenfield)	Greenfield

Map ID	Water	NFIP
WA16	Water Tower (Greenfield)	Greenfield
WA17	Water Tower (Greenfield)	Greenfield
WA18	Water Tower (Shirley)	Hancock County

**APPENDIX 5**

**USGS Stream Gage Locations and Major  
Waterways**

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Active Stream Gage Location	
Site Number	Site Name
03361650	SUGAR CREEK AT NEW PALESTINE, IN

Major Waterways		
Amity Branch	Harlan Run	Palestine Branch
Andis Ditch	Heinrich Ditch	Parker Ditch
Anthony Creek	Henry Ditch	Parker Eastes Ditch
Ashcraft Ditch	India Branch	Pee Dee Ditch
Barrett Ditch	Jackson Ditch	Perry Brook
Bee Camp Creek	Jackson Ditch Arm	Potts Ditch
Beeler Ditch	Jay Ditch	Powers Ditch
Big Blue River	Jones Ditch	Prairie Run
Bills Branch	Keck Ditch	Putter Ditch
Boots Ditch	Kirkhoff Ditch	Rash Ditch
Boyd Ditch	Kuhn Ditch	Redskin Brook
Brandywine Creek	Lead Creek	Richey Ditch
Brant Ditch	Leary Ditch	Shirley Drain
Breier Arm	Leary Weber Ditch	Sixmile Creek
Breier Creek	Little Brandywine Creek	Skaggs Creek
Brown Ditch	Little Sugar Creek	Small Branch
Buck Creek	MacDougall Ditch	Smith Ditch
Burris Ditch	Maize Run	Smith Johnson Ditch
Cahill Shore Ditch	March and Trees Ditch	Snider Branch
Corn Run	Maxwell Ditch	Stansbury Ditch
Cumberland Creek	McCray Run	Steele Ditch
Dilly Creek	McFadden Ditch	Sugar Creek
Doe Creek	Merlau Ditch	Sugar Run
Dry Branch	Middle Fork Dry Branch	Sweet Creek
Dunn Ditch	Million Brook	Thompson Ditch
Dunwoody Ditch	Mingle Ditch	Village Brook
Eastes Ditch	Morris Creek	Weber Ditch
Flatfork Creek	Nameless Creek	West Little Sugar Creek
Fuller Ditch	New Ditch	Wicker Ditch
Grain Creek	North Fork Dry Branch	Williamson Ditch
Hack Ditch	O'Hara Ditch	Willow Branch
Hall Ditch	Oats Run	Wilson Ditch
Ham Ditch	Ogle Ditch	

**APPENDIX 6**

**NCDC HAZARD DATA**

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The following data tables indicate those events that have impacted Hancock County and the communities within. Please note that these tables only provide the information for those incidents where deaths, injuries, or property and/or crop damages were reported through the NCD. For complete tables listing all incidents impacting Hancock County, please visit:

<http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=18%2CINDIANA>

<u>Location</u>	<u>County/Zone</u>	<u>Date</u>	<u>Type</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
<b>Totals:</b>				0	0	3.057M	0.50K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">06/04/2008</a>	Flash Flood	0	0	5.00K	0.00K
<a href="#">MOHAWK</a>	HANCOCK CO.	<a href="#">04/29/2009</a>	Flood	0	0	3.00M	0.00K
<a href="#">MOHAWK</a>	HANCOCK CO.	<a href="#">04/04/2011</a>	Flood	0	0	0.50K	0.50K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">05/01/2012</a>	Flood	0	0	1.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">12/22/2013</a>	Flash Flood	0	0	50.00K	0.00K
<b>Totals:</b>				0	0	3.057M	0.50K

<u>Location</u>	<u>County/Zone</u>	<u>Date</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
<b>Totals:</b>					0	2	\$329.15K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">05/30/2008</a>	Thunderstorm Wind	60 kts. EG	0	0	15.00K	0.00K
<a href="#">NEW PALESTINE</a>	HANCOCK CO.	<a href="#">06/26/2008</a>	Thunderstorm Wind	65 kts. EG	0	0	2.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">05/13/2009</a>	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">07/25/2009</a>	Thunderstorm Wind	56 kts. EG	0	0	35.00K	0.00K
<a href="#">POPE ARPT</a>	HANCOCK CO.	<a href="#">08/04/2009</a>	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
<a href="#">WOODBURY</a>	HANCOCK CO.	<a href="#">06/22/2010</a>	Thunderstorm Wind	55 kts. EG	0	0	1.50K	0.00K
<a href="#">FORTVILLE</a>	HANCOCK CO.	<a href="#">08/11/2010</a>	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">10/26/2010</a>	Thunderstorm Wind	65 kts. EG	0	0	2.50K	0.00K
<a href="#">POPE ARPT</a>	HANCOCK CO.	<a href="#">10/26/2010</a>	Thunderstorm Wind	70 kts. EG	0	0	5.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">10/26/2010</a>	Thunderstorm Wind	70 kts. EG	0	0	10.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	<a href="#">10/26/2010</a>	Thunderstorm Wind	67 kts. MG	0	0	0.00K	0.00K
<a href="#">WARRINGTON</a>	HANCOCK CO.	<a href="#">10/26/2010</a>	Thunderstorm Wind	70 kts. EG	0	2	75.00K	0.00K
<a href="#">FORTVILLE</a>	HANCOCK CO.	<a href="#">2/28/2011</a>	Thunderstorm Wind	70 kts. EG	0	0	147.00K	0.00K
<a href="#">FINLY</a>	HANCOCK CO.	<a href="#">3/30/2012</a>	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
<a href="#">FORTVILLE</a>	HANCOCK CO.	<a href="#">7/17/2012</a>	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
<a href="#">MC CORDSVILLE</a>	HANCOCK CO.	<a href="#">7/19/2012</a>	Thunderstorm Wind	63 kts. MG	0	0	1.00K	0.00K

<a href="#">MC CORDSVILLE</a>	HANCOCK CO.	7/19/2012	Thunderstorm Wind	52 kts. EG	0	0	0.15K	0.00K
<a href="#">WILLOW BRANCH</a>	HANCOCK CO.	8/4/2012	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
<a href="#">GREENFIELD</a>	HANCOCK CO.	5/11/2014	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
<a href="#">MOHAWK</a>	HANCOCK CO.	9/4/2015	Thunderstorm Wind	56 kts. EG	0	0	10.00K	0.00K
<a href="#">FORTVILLE</a>	HANCOCK CO.	12/23/2015	Thunderstorm Wind	61 kts. EG	0	0	12.00K	0.00K
<b>Totals:</b>					0	2	\$329.15K	0.00K

<u>Location</u>	<u>County/Zone</u>	<u>Date</u>	<u>Type</u>	<u>Mag.</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
<b>Totals:</b>					0	0	825.0K	0.00K
<a href="#">MT COMFORT</a>	HANCOCK CO.	5/30/2008	Tornado	EF1	0	0	250.0K	0.00K
<a href="#">MC CORDSVILLE</a>	HANCOCK CO.	5/30/2008	Tornado	EF1	0	0	500.0K	0.00K
<a href="#">WARRINGTON</a>	HANCOCK CO.	10/26/2010	Tornado	EF0	0	0	75.0K	0.00K
<b>Totals:</b>					0	0	825.0K	0.00K

<u>Location</u>	<u>County/Zone</u>	<u>Date</u>	<u>Type</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
<b>Totals:</b>				0	0	15.00K	0.00K
<a href="#">HANCOCK (ZONE)</a>	HANCOCK (ZONE)	03/04/2008	Winter Storm	0	0	11.000M	0.00K
<b>Totals:</b>				0	0	11.945M	50.00K

**APPENDIX 7      IMPLEMENTATION CHECKLIST**

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MITIGATION PRACTICE	HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<b>Management of High Hazard Dams</b> 1. Complete IEAP and annual exercise for existing and new high hazard dams 2. Review regular inspection and maintenance records of high hazard dams	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 2. IDNR receives inspection reports and IEAP updates  <b>Proposed Enhancements –</b> 1. Complete IEAP and annual exercise for Sugar Hills Lake Dam 2. Ensure inspections are reported and required improvements and repairs are completed in a timely manner	
<b>Geographic Information Systems</b> 1. Update and coordinate GIS layers with location and attributes of critical infrastructure 2. Train GIS staff in HAZUS-MH to quantitatively estimate losses in “what if scenarios” and continue to use the most recent GIS data in land use planning efforts. 3. Update HAZUS-MH Earthquake model with local soil data for more accurate damage estimates	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High <i>(update layers)</i>  Moderate <i>(train, update earthquake model)</i>	<b>Ongoing –</b> 1. GIS is used by several communities 2. Some staff are familiar with HAZUS-MH  <b>Proposed Enhancement –</b> 1. Coordinate consistent layers county-wide 2. Additional training for GIS staff 3. Update with local information	

MITIGATION PRACTICE	HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<p><b>Emergency Preparedness &amp; Warning</b></p> <ol style="list-style-type: none"> <li>1. Improve planning and coordination among event coordinators, facility owners, and emergency response teams</li> <li>2. Implement recommendations of outdoor warning siren study to continue to alert population of severe weather conditions</li> <li>3. Evaluate and utilize flood forecasting capabilities including stream gages, flood forecast maps, and flood alerts</li> <li>4. Require weather radios in all critical infrastructure and encourage use by residents and businesses.</li> <li>5. Improve disaster preparedness and emergency response at the local level through the CERT program</li> <li>6. Increase awareness and participation in the Everbridge/NIXEL or Blackboard Connect notification system</li> <li>7. Coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts.</li> <li>8. Purchase additional mobile electronic messaging boards and develop protocol to provide current hazard information.</li> <li>9. Convey flood height warnings from the USGS river gages in terms the general public can understand</li> <li>10. Investigate the potential to develop a siren fund through payments made during development of subdivisions or industrial/commercial areas</li> <li>11. Install permanent dynamic message board in highly visible area to provide current hazard information</li> </ol>	<p><b>HAZARD ADDRESSED</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Drought</li> <li><input checked="" type="checkbox"/> Earthquake</li> <li><input checked="" type="checkbox"/> Extreme Temperature</li> <li><input checked="" type="checkbox"/> Flood</li> <li><input checked="" type="checkbox"/> Hail/Thunder/Wind</li> <li><input checked="" type="checkbox"/> Tornado</li> <li><input checked="" type="checkbox"/> Winter Storm/Ice</li> <li><input checked="" type="checkbox"/> Dam Failure</li> <li><input checked="" type="checkbox"/> HazMat Incident</li> </ul>	<p><b>PRIORITY</b></p> <p>High ( improved planning, sirens, forecasting, weather radios, CERT, notification system, private message boards, mobile message boards )</p>	<p><b>UPDATE STATUS</b></p> <p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Some coordination with event planners</li> <li>2. Outdoor warning siren study completed</li> <li>3. The County has 1 real-time AHPS Stream Gage</li> <li>4. Weather radios are provided during community events</li> <li>5. Some citizens are CERT certified</li> <li>6. NIXEL and Blackboard Connect are utilized</li> <li>8. There are few mobile message boards within the County</li> </ol> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>1. Improve coordination with additional events and large gatherings</li> <li>2. Continue to implement recommendations as funding allows</li> <li>3. Continue to enhance warning system</li> <li>4. Continue to provide weather radios</li> <li>5. Rebuild and enhance the CERT program to have a representative or team in each community</li> <li>6. Increase participation in notification programs</li> <li>7. Coordinate with private business owners and develop list of willing participants</li> <li>8. Purchase additional message boards to increase number to two per community</li> <li>9. Develop information for providing flood height warnings from the USGS to the general public</li> <li>10. Research, propose and adopt an ordinance creating a siren fund</li> <li>11. Coordinate with INDOT to investigate the feasibility of adding a permanent message board</li> </ol>	<p><b>2021 STATUS</b></p> <p>Moderate (flood height warnings, additional stream gage)</p> <p>Low (siren fund, permanent message boards)</p>

MITIGATION PRACTICE	HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<b>Public Education &amp; Outreach</b> 1. Post information/warning signs in local parks and other public gathering places explaining what to do in case of a hazard event. 2. Provide multi-lingual hazard preparedness literature (warning sirens, radio stations, go-kits, insurance protection, lightning rods, etc.) during Severe Weather Awareness Week, at public facilities and events and to populations within known hazard areas such as floodplains, downstream of a dam, near hazmat facilities, etc. (2007 Measure) 3. Develop an education and outreach campaign encouraging residents to keep in contact with their neighbors during hazard events.	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High <i>(post info, multi-lingual education materials)</i>	<b>Ongoing –</b> 2. Literature is provided at several public facilities and office locations as well as large public events throughout the County. Populations within the special flood hazard areas are educated through required flood insurance purchases and various website and literature pieces.  <b>Proposed Enhancement –</b> 1. Post information in parks and other gathering places 2. Encourage the enhancement of the messages provided to various cultural groups and neighborhoods; Educate landowners within the dam inundation areas of the potential dangers and what to do in an emergency situation. Such as encourage voluntary purchase of federally-subsidized flood insurance; 3. Formalize a neighborhood or local campaign where community representatives familiar with the culture and language provide residents with emergency information and protocols.	
<b>Community Rating System</b> 1. Reduce flood insurance premiums through increased participation or advancement in the NFIP's CRS Program. (2007 Measure)  <i>(Will assist with NFIP compliance)</i>	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 1. Hancock County participates at a Class 8  <b>Proposed Enhancement –</b> 1. Increased participation from County and entry from other communities	
<b>Hazardous Materials Response Team</b> 1. Maintain LEPC reporting and training efforts as required through SARA Title III and ensure current facility maps and response plans are on file for Tier II facilities.	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 1. Hancock County participates at a Class 8  <b>Proposed Enhancement –</b> 1. Increased participation from County and entry from other communities	

MITIGATION PRACTICE	HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<b>Stormwater Management</b> 1. Minimize impacts of flooding by diverting or retaining stormwater onsite using green infrastructure practices 2. Maintain channels and regulated drains to prevent localized flooding 3. Address flooding in low lying and urban areas due to poor drainage	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 1. Channels and regulated drains are maintained as funding and staffing allow  <b>Proposed Enhancement –</b> 1. Increase use of green infrastructure as feasible 2. Continue to maintain channels and drains 3. Investigate causes of non-riverine flooding	
<b>Transportation</b> 1. Study designated hazardous materials transportation routes and determine if laws are followed 2. Investigate status and prioritize enhancements for warning (flashing lights, crossing arms, rumble strips, signage) at each intersection between rail and road to reduce the potential for train/vehicular crashes	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 1. Routes are well known or marked 2. Many crossings have barriers or warnings  <b>Proposed Enhancement –</b> 1. Improve enforcement 2. Increase number of crossings with barriers or warnings	
<b>Tree Maintenance</b> 1. Maintain trees on public property and right-of-ways and encourage maintenance on private property to reduce the risk of downed utility lines and falling limbs	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	High	<b>Ongoing –</b> 1. Utility providers perform routine maintenance along ROW  <b>Proposed Enhancement –</b> Encourage private landowners to perform maintenance or avoid planting improper trees and shrubs	

MITIGATION PRACTICE	HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<b>Building Protection</b> 1. Prohibit the development of new critical infrastructure in 1% & 0.2% annual chance flood hazard and potential dam failure inundation areas. (2007 Measure) 2. Develop reciprocal agreements for structural inspections following hazardous events 3. Relocate, buyout, or floodproof (non-residential) existing non-critical facilities subject to flooding 4. Enforce tie-down and anchoring requirements for roof-mounted HVAC units 5. Protect existing critical facilities in floodplains 6. Encourage new or retrofitted critical facilities to incorporate structural bracing, shutters, laminated/impact-resistant glass and/or interlocking roof coverings to minimize damage 7. Develop an inventory and complete an inspection of public and commercial buildings that may be particularly vulnerable to earthquake damage  <i>(Will assist with NFIP compliance)</i>	<input type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High <i>(prohibit development, reciprocal agreements, relocate, tie-downs)</i>  Moderate <i>(protect critical facilities, new or retrofitted bracing, building inventory)</i>	<b>Ongoing –</b> 1. Ordinances prohibit construction of new critical facilities within the 0.2% annual chance flood area.  <b>Proposed Enhancements –</b> 1. Continue to discourage development within floodplains, include potential dam inundation areas. 2. Develop agreements for post-event inspections 3. Inventory and prioritize non-residential facilities for buyout or floodproofing 4. Develop inspection program for roof mounted HVAC units 5. Protect the structures identified in Table 3-10 6. Encourage enhancements for new or retrofitted municipal critical facilities 7. Create an inventory of vulnerable buildings	
<b>Land Use Planning &amp; Zoning</b> 1. Incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plan and Development Review to better guide future growth and development 2. Conduct a Safe Growth Audit of development plans and codes	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	High <i>(Incorporate hazard information)</i>  Moderate <i>(growth audit)</i>	<b>Ongoing –</b> 1. Hazard information has been incorporated into some areas of the Comprehensive Land Use Plan  <b>Proposed Enhancement –</b> 1. Increase the number of hazards considered, more definitively outline higher risk areas and those that should be avoided for future development 2. Conduct the audit and implement recommendations	

MITIGATION PRACTICE		HAZARD ADDRESSED	PRIORITY	UPDATE STATUS	2021 STATUS
<p><b>Emergency Response &amp; Recovery</b></p> <ol style="list-style-type: none"> <li>1. Add mobile data terminals to all emergency response vehicles</li> <li>2. Establish procedures to alert and evacuate the population in known hazard areas (Tier II buffers, dam inundation areas)</li> <li>3. Develop and implement a voluntary immunization program for all emergency responders, inspection staff, and families</li> <li>4. Increase number of full time paid positions for fire departments and emergency response teams for responding to HazMat incidents</li> <li>5. Coordinate communications, documentation, and record keeping between NFIP communities and agencies including a database of accurate and community specific information following each hazard event</li> <li>6. Establish procedures to alert and evacuate the populations in known hazard areas (routinely flooded areas)</li> </ol>	<input checked="" type="checkbox"/> Drought <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Hail/Thunder/Wind <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm/Ice <input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> HazMat Incident	<p>High (terminals, evacuations for Tier II and dams, immunizations, full-time positions)</p> <p>Moderate (coordinate communications)</p> <p>Low (evacuation for flood areas)</p>	<p>Ongoing –</p> <ol style="list-style-type: none"> <li>1. Many vehicles have terminals</li> </ol> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>1. Inventory all response vehicles and purchase terminals as able</li> <li>2. Establish procedures to evacuate areas near Tier II and dams</li> <li>3. Develop a wide-based immunization program</li> <li>4. Increase number of HazMat trained staff</li> <li>5. Coordinate response efforts following each hazard event</li> <li>6. Establish procedures to evacuate routinely flooded areas</li> </ol>		
<p><b>Floodplain Management</b></p> <ol style="list-style-type: none"> <li>1. Prioritize and conduct detailed hydraulic analyses of areas with repetitive flooding problems and unnumbered Zone A streams to determine floodplain boundaries: (2007 Measure)</li> <li>2. Support FEMA approved flood depth mapping (RiskMAP) to better show the flood risk potential</li> <li>3. Create fluvial erosion hazard mapping to identify critical infrastructure that may be impacted by natural stream movement</li> </ol> <p>(Will assist with NFIP compliance)</p>	<input type="checkbox"/> Drought <input type="checkbox"/> Earthquake <input type="checkbox"/> Extreme Temperature <input checked="" type="checkbox"/> Flood <input type="checkbox"/> Hail/Thunder/Wind <input type="checkbox"/> Tornado <input type="checkbox"/> Winter Storm/Ice <input type="checkbox"/> Dam Failure <input type="checkbox"/> HazMat Incident	<p>High (hydraulic analyses, RiskMAP)</p> <p>Low (fluvial erosion)</p>	<p>Ongoing –</p> <p><b>Proposed Enhancements –</b></p> <ol style="list-style-type: none"> <li>1. Complete analyses as appropriate to determine floodplain boundaries and flood depth grid mapping to include all flood prone areas within the County. Implement flood protection study recommendations as feasible</li> <li>2. Support flood depth mapping for prioritized areas</li> <li>3. Create the fluvial erosion hazard mapping</li> </ol>		





**APPENDIX 8      POTENTIAL FUNDING SOURCES**

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### **AmeriCorps**

The AmeriCorps\*State works with Governor-appointed State Service Commissions to provide grants to non-government and government entities that sponsor service programs. These organizations use their grants to engage AmeriCorps members in service to help meet critical community needs in education, public safety, health, and the environment.

**Previous Activities Funded:** Assisting disaster victims, building homes, restoring parks and other community facilities while mobilizing community volunteers.

Ms. Paula Parker-Sawyers, Exec. Director  
Office of Faith-Based & Community Initiative  
302 W Washington St. Room E220  
Indianapolis IN 46204-4701  
317.233.4273 ~ Phone  
317.233.5660 ~ Fax  
[www.state.in.us/iccsv](http://www.state.in.us/iccsv)

### **Assistance to Firefighters Grant**

The Assistance to Firefighters Grant (AFG) is a competitive grant opportunity for local fire departments and Emergency Medical Service (EMS) organizations that are not affiliated with a hospital.

**Previous Activities Funded:** The AFG funds activities such as purchasing firefighting equipment, personal protection equipment, training, firefighting vehicles, and firefighter/first responder safety projects.

<http://www.firegrantsupport.com/>

### **Challenge 21, Floodplain**

Challenge 21, the Army Corps' flood hazard mitigation and riverine ecosystem restoration initiative, will focus on more sustainable approaches. Through its focus on non-structural alternatives to flood protection, it will, where appropriate, move families and businesses out of harm's way and strive to return the floodplains of rivers and creeks to a condition where they can naturally moderate floods as well as provide other benefits to communities and the environment. Watershed by watershed, Challenge 21 builds on existing programs and initiates and expands partnerships with other Federal agencies and non-Federal national and local entities. Key Federal partners include the FEMA, the Department of Agriculture, the Department of Interior and the EPA.

**Previous Activities Funded:** A project might include the relocation of threatened homes or businesses, conservation or restoration of wetlands and natural floodwater storage areas and planning for responses and solutions to potential future floods

[http://www.americanrivers.org/site/PageServer?pagename=AMR\\_content\\_d156](http://www.americanrivers.org/site/PageServer?pagename=AMR_content_d156)

### **CHIEF Grants Service**

CHIEF Grants is a free service from CHIEF supply company. Dedicated to helping public safety professionals meet today's funding challenges, CHIEF Grants is a one-stop shop for open grants, grant writing tips, seminars, and grant news.

**Previous Activities Funded:** Various types of grants are highlighted with numerous activities funded. This a grant service, not an individual grant opportunity.

<http://www.chiefsupply.com/grants/>

### **Clean Water State Revolving Loan Fund**

Clean Water State Revolving Loan Fund (CWSRLF) programs operate much like environmental infrastructure banks that are capitalized with federal and state contributions. CWSRLF monies are loaned to communities and loan repayments are recycled back into the program to fund additional water quality protection projects. The revolving nature of these programs provides for an ongoing funding source that will last far into the future.

**Previous Activities Funded:** The CWSRF funds a broad range of projects—from wastewater systems and nonpoint source pollution control to estuary management and a range of projects focusing on water quality. Funding is typically directed to state-identified high priority projects based on several factors, including: public health protection; condition of impacted waters; and communities' regulatory compliance status.

<http://epa.gov/OW-OWM.html/cwfinance/cwsrf/basics.htm>

### **Community Development Block Grants**

Communities receiving Community Development Block Grants (CDBG) funds from the State may use the funds for many kinds of community development activities including, but not limited to property acquisition, public services, planning activities, and community development activities.

**Previous Activities Funded:** Funds have been used in Indiana for purposes such as Public facility improvements, flood and drainage facilities, Fire stations and equipment, and various community related activities and facilities.

<http://www.in.gov/ihfa/comdev/comp/manuals/im/im.htm>

Ms. Deanna Oware, Director  
State of Indiana  
Department of Commerce/Community Development  
One N. Capitol Ave.  
Suite 600  
Indianapolis, IN 46204-2027  
Phone: 317-232-8911  
Fax: 317-233-3597

### **Community Facilities Grants and Loans**

The Rural Housing Service (RHS) of the Department of Agriculture offers loans and grants to construct, enlarge, extend, or otherwise improve community facilities providing essential services to rural residents.

**Previous Activities Funded:** Priority for funding will be given to those projects that will enhance public safety such as fire, police, rescue, and ambulance services, and projects for health care facilities. The fire service can use the funding for fire stations, fire trucks and rescue vehicles.

[www.rurdev.usda.gov/rhs/ProgramBriefs/brief\\_cp\\_grant.htm](http://www.rurdev.usda.gov/rhs/ProgramBriefs/brief_cp_grant.htm)

### **Community Rating System**

The National Flood Insurance Program's (NFIP) Community Rating System (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.

**Previous Activities Funded:** While the CRS does not provide direct funding, reductions in insurance premiums can be significant for participants.

<http://www.fema.gov/nfip/crs.shtm>

### **Conservation Reserve Program**

The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland to reduce soil erosion, and potential flood loss and damage.

**Previous Activities Funded:** Filter Strip Establishment, Wetland Restoration, Riparian Buffer Establishment

<http://www.fsa.usda.gov/dafp/cepd/crp.htm>

### **The Cora Brown Fund**

To provide for disaster-related needs that have not been, or will not be met by government agencies or any other organizations which have programs to address such needs; however, the fund is not intended to replace or supersede these programs. The fund may not be used in a way that is inconsistent with other federally mandated disaster assistance or insurance programs. Money from the fund will not duplicate assistance for which a person is eligible from other sources.

**Previous Activities Funded:** Disaster related home repair and rebuilding, services which alleviate human suffering due to disasters and disaster related unmet needs.

[http://www.federalgrantswire.com/cora\\_brown\\_fund.html](http://www.federalgrantswire.com/cora_brown_fund.html)

### **Department of Interior Rural Fire Assistance Program**

The Department of Interior (DOI) Rural Fire Assistance Program is aimed at enhancing the fire protection capabilities of rural fire districts in the wildland urban interface. The rural fire department must serve a community with a population of 10,000 or less and must have a statewide agreement with the state forester who maintains cooperative agreements with the rural fire departments or volunteer fire departments or a cooperative fire agreement with an agency in the DOI.

**Previous Activities Funded:** The program assists with training, equipment purchase, and prevention activities, on a 90/10 cost-share basis.

<http://www.nifc.gov/rfa/steps.html>

### **Direct Housing: Natural Disaster**

Funds are only available to the extent that funds are not provided by the Federal Emergency Management Agency (FEMA). For the purpose of administering these funds, natural disaster will only include those areas identified by a Presidential declaration.

**Previous Activities Funded:** To assist qualified lower income rural families to meet emergency assistance needs resulting from natural disaster to buy, build, rehabilitate, or improve dwellings in rural areas.

[http://www.federalgrantswire.com/direct\\_housingnatural\\_disaster.html](http://www.federalgrantswire.com/direct_housingnatural_disaster.html)

### **Disaster Reserve Assistance**

To provide emergency assistance to eligible livestock owners, in a State, county, or area approved by the Secretary or designee, where because of disease, insect infestation, flood, drought, fire, hurricane, earthquake, hail storm, hot weather, cold weather, freeze, snow, ice, and winterkill, or other natural disaster, a livestock emergency has been determined to exist.

**Previous Activities Funded:** This assistance is in the form of a direct payment to affected eligible landowners and is administered through the Farm Service Agency.

[http://www.federalgrantswire.com/disaster\\_reserve\\_assistance.html](http://www.federalgrantswire.com/disaster_reserve_assistance.html)

### **Disposal of Federal Surplus Real Property for Parks, Recreation, and Historic Monuments**

Surplus real property may be conveyed for public park and recreation use at discounts up to 100 percent of fair market value and for historic purposes without monetary consideration. Property conveyed for park and recreation use or historic purposes must be used for these purposes in perpetuity or be reverted to Federal ownership.

**Previous Activities Funded:** Property, either real or land, varies with time with items available for public sale, lease or extended use in perpetuity.

[http://www.federalgrantswire.com/disposal\\_of\\_federal\\_surplus\\_real\\_property\\_for\\_parks\\_recreation\\_and\\_historic\\_monuments.html](http://www.federalgrantswire.com/disposal_of_federal_surplus_real_property_for_parks_recreation_and_historic_monuments.html)

### **Emergency Conservation Program**

The United States Department of Agriculture (USDA) Farm Service Agency's (FSA) Emergency Conservation Program (ECP) provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures in periods of severe drought.

**Previous Activities Funded:** This assistance is in the form of a direct payment to affected eligible landowners and is administered through the Farm Service Agency.

<http://disaster.fsa.usda.gov/ecp.htm>

### **Environmental Quality Incentive Program**

The Environmental Quality Incentive Program (EQIP) offers contracts with a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. These contracts provide incentive payments and cost-shares to implement conservation practices. Persons who are engaged in livestock or agricultural production on eligible land may participate in the EQIP program. EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. The practices are subject to Natural Resources Conservation Service (NRCS) technical standards adapted for local conditions. The local conservation district approves the plan.

**Previous Activities Funded:** Cost sharing may pay up to 75 percent of the costs of certain conservation practices, such as grassed waterways, filter strips, manure management facilities, capping abandoned wells, and other practices important to improving and maintaining the health of natural resources in the area.

<http://www.nrcs.usda.gov/programs/eqip/>

### **Emergency Rehabilitation of Flood Control Works**

Assistance does not extend to major improvements of flood control or federally authorized coastal protection structures, nor to reimbursement of individuals or communities for funds expended in repair or rehabilitation efforts.

**Previous Activities Funded:** Authorized assistance includes emergency repair or rehabilitation of flood control works damaged by flood, and restoration of federally authorized coastal protection structures damaged by extraordinary wind, wave, or water action.

[http://www.federalgrantswire.com/emergency\\_rehabilitation\\_of\\_flood\\_control\\_works\\_or\\_federally\\_authorized\\_coastal\\_protection\\_works.html](http://www.federalgrantswire.com/emergency_rehabilitation_of_flood_control_works_or_federally_authorized_coastal_protection_works.html)

### **Emergency Watershed Protection Program**

The Emergency Watershed Protection Program (EWPP) work is not limited to any one set of prescribed measures. A case by case investigation of the needed work is made by NRCS.

**Previous Activities Funded:** EWPP work can include: removing debris from stream channels, road culverts, and bridges; reshaping and protecting eroded banks; correcting damaged drainage facilities; repairing levees and structures; reseeding damaged areas; and purchasing floodplain easements.

<http://www.nrcs.usda.gov/programs/ewp/questions.html>

### **Farmland Protection Program**

The Farmland Protection Program provides funds to help purchase development rights to keep productive farmland in agricultural uses. To qualify, farmland must: be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production. Depending on funding availability, proposals must be submitted by the government entities to the appropriate NRCS State Office during the application window.

**Previous Activities Funded:** Working through existing programs, USDA joins with State, tribal, or local governments to acquire conservation easements or other interests from landowners. USDA provides up to 50 percent of the fair market easement value.

<http://www.info.usda.gov/nrcs/fpcp/fpp.htm>

#### **Fire Prevention & Safety Grant**

The purpose of these grants is to enhance the safety of the public and firefighters with respect to fire and fire-related hazards. The primary goal of the Assistance to Firefighters Grant (AFG) Program's Fire Prevention and Safety Grant (FP&S) is to reach high-risk target groups in order to mitigate the high incidences of death and injuries. Additionally for Fiscal Year (FY) 2005 Congress amended the authorization to include funding for Firefighter Safety Research and Development. This guidance provides details for applying for either of these financial assistance instruments. There is no cost share requirement for the FY 2005 Fire Prevention and Safety grants.

**Previous Activities Funded:** Grants have been awarded to assist with the costs associated with training, equipment, vehicles for fire departments and firefighter safety research.

[http://www.firegrantsupport.com/fp\\_about.aspx](http://www.firegrantsupport.com/fp_about.aspx)

#### **Flood Mitigation Assistance Program**

The Flood Mitigation Assistance (FMA) program provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses.

**Previous Activities Funded:** A few examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures.

<http://www.fema.gov/fima/mitgrant.shtm>

#### **Hazards Mitigation Grant Program**

Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

**Previous Activities Funded:** Acquisition of hazard-prone property; stormwater management, elevation of flood-prone structures, and infrastructure protection measures are all considered eligible projects and have been funded in the past.

<http://www.fema.gov/fima/mitgrant.shtm>

### **Hazardous Materials Emergency Preparedness Grant**

The Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance as well as national direction and guidance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and to Local Emergency Planning Committees (LEPCs) for hazmat planning.

**Previous Activities Funded:** These grants have been used for developing, improving, and implementing emergency plans, and training public sector employees to respond safely and efficiently to accidents and incidents involving the transportation of hazardous materials.

<http://hazmat.dot.gov/training/state/hmep/hmep.htm>

### **Indiana Family and Social Services Administration**

The Family and Social Services Administration provides services to help keep children healthy and safe and help families to self-sufficient.

**Previous Activities Funded:** The agency may provide programs related to heating/cooling of residential buildings, temporary housing, and other important contacts in the event of an emergency or disaster.

<http://www.in.gov/fssa/families/>

### **Indiana Resource Conservation & Development Districts**

The purpose of the Resource Conservation and Development (RC&D) program is to accelerate the conservation, development and utilization of natural resources, improve the general level of economic activity, and to enhance the environment and standard of living in designated RC&D areas. It improves the capability of State, tribal and local units of government and local nonprofit organizations in rural areas to plan, develop and carry out programs for resource conservation and development. The program also establishes or improves coordination systems in rural areas.

**Previous Activities Funded:** Forestry projects, wetland development, Community training projects, and other projects related to community and natural resource enhancement and protection.

<http://www.in.nrcs.usda.gov/programs/RC&D/RC&Dhomepage.html>

### **Indiana Rural Development Council**

The Indiana Rural Development Council (IRDC) is a partnership of local, state, federal, profit and not-for-profit stakeholders that serve Indiana communities. The IRDC's purpose is to coordinate efforts of citizens and governments to meet the economic and social needs of rural Indiana.

**Previous Activities Funded:** These funds will be utilized to address a variety of rural issues in the areas of economic/community development, planning, leadership, infrastructure, health, telecommunication/education, workforce development, agriculture, and rural regional development initiatives.

<http://www.in.gov/irdc/index.html>

### **Indiana State Revolving Loan Fund**

The Indiana State Revolving Fund (SRF) Loan Program provides low-interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructure. The Indiana Department of Environmental Management (IDEM) and the Indiana State Budget Agency work together

to administer this program and to protect public health and the environment. Recently, SRF has implemented a program to fund nonpoint source projects, as well.

**Previous Activities Funded:** Activities include Treatment plant improvements and upgrades, Riparian Buffers and Conservation Easements, and Wetland protection and restoration measures.

<http://www.in.gov/idem/srf/factsht0704.doc>

#### **Indiana Transportation Enhancements Program**

Transportation enhancements (TE) are transportation-related activities that are designed to strengthen the cultural, aesthetic, and environmental aspects of the Nation's inter-modal transportation system.

**Previous Activities Funded:** The transportation enhancements program provides for the implementation of a variety of non-traditional projects, with examples ranging from Acquisition of scenic easements, landscaping and scenic beautification, and to the mitigation of water pollution from highway runoff all of which could be utilized as measures to control or mitigate flood damage.

[http://www.enhancements.org/statecontacts\\_TE.asp](http://www.enhancements.org/statecontacts_TE.asp)

#### **Land and Water Conservation Fund**

The Land and Water Conservation Fund (LWCF) program provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States.

**Previous Activities Funded:** Funds have been widely utilized for land acquisition, open space/greenspace development, which can include wetland development, critical seeding areas and other projects that can reduce the impacts of flooding.

<http://www.nps.gov/lwcf/>

#### **Low Interest Loan Incentives**

Loan amounts up to \$700,000 with interest rates of 2.5 percent to 3.0 percent are available to cities, towns and counties. The loan pays for the cost of remediation and/or demolition at identified brownfield sites.

**Previous Activities Funded:** Eligible activities include: soil and groundwater cleanup, demolition activities, asbestos/lead paint abatement, and additional investigations.

<http://www.idfabrownfields.com/assistance.aspx#LILI>

#### **National Flood Insurance Program**

The National Flood Insurance Program (NFIP) is a Federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

**Previous Activities Funded:** Flood insurance is made available within the community as a financial protection against flood losses.

<http://www.fema.gov/nfip/intnfip.shtm>

#### **Office for Domestic Preparedness Terrorism Formula Grants**

The Office for Domestic Preparedness (ODP) provides funding through the states awards to enhance the capacity of emergency responders to prevent, deter, or respond to terrorist incidents involving weapons of mass destruction. The funding is awarded to a point of contact in each state and then distributed within the state.

**Previous Activities Funded:** Activities have included training, technical assistance, equipment, planning and exercises related to domestic terrorism events.

<http://www.ojp.gov/state.htm>

#### **Petroleum Remediation Grant Incentive**

Grant amounts up to \$250,000 per applicant and per funding round are available to cities, towns and counties. The grant pays for the cost of petroleum remediation at identified brownfield sites.

**Previous Activities Funded:** Eligible activities include: underground storage tank removal, Corrective Action Plan preparation, IDEM approved remediation and monitoring.

<http://www.idfabrownfields.com/assistance.aspx#PRGI>

#### **Pre-Disaster Mitigation Program**

The Pre-Disaster Mitigation (PDM) program provides technical and financial assistance to States and local governments for cost-effective pre-disaster hazard mitigation activities that complement a comprehensive mitigation program, and reduce injuries, loss of life, and damage and destruction of property. FEMA provides grants to States and Federally recognized Indian tribal governments that, in turn, provide sub-grants to local governments (to include Indian Tribal governments) for mitigation activities such as planning and the implementation of projects identified through the evaluation of natural hazards.

**Previous Activities Funded:** Acquisition and/or relocation of flood-prone properties, Drainage/stormwater management projects, and hazard mitigation planning activities.

<http://www.fema.gov/fima/mitgrant.shtm>

#### **Public Assistance Grant Program**

FEMA's Public Assistance (PA) Grant Program allows State and Local governments and Non-Profit Organizations to respond to disasters, to recover from their impact and to mitigate impact from future disasters. The PA Program provides the basis for consistent training and credentialing of staff who administer the program; more accessible and understandable guidance and policy for participating in the grant program; improved customer service through a more efficient grant delivery process, applicant-centered management, and better information exchange; and continuing performance evaluations and program improvements.

**Previous Activities Funded:** Debris removal from public roads and rights-of-way, Emergency protective measures including search and rescue, warning of hazards, and demolition of unsafe structures, Utility

Distribution Systems, such as water treatment and delivery systems; and sewage collection and treatment facilities and public parks.

<http://www.fema.gov/rrr/pa/>

#### **Purdue Cooperative Extension Service**

Purdue Cooperative Extension Service provides valuable educational materials and training programs to assist in the event of a disaster or emergency

#### **Steve Cain**

Disaster Communication Specialist

615 W. State Street

Purdue University

West Lafayette, IN 47907

765-494-8410

**Previous Activities Funded:** Activities are educational in nature and not generally monetary offerings.

<http://www.ces.purdue.edu/eden/index.html>

#### **Severe Repetitive Loss**

This purpose of this FEMA program is to reduce or eliminate claims under the NFIP. This program applies to residential properties covered under an NFIP flood insurance policy and has at least 4 NFIP claim payments over \$5,000 each and a cumulative amount exceeds \$20,000 OR for which 2 separate claims payments have been made with the cumulative amount of the building portion exceeding the market value of the building.

**Previous Activities Funded:** Acquisition and demolition or relocation of at risk structures and conversion of the land to open space; elevation of existing structures to at least the Base Flood Elevation (BFE); minor physical localized flood reduction projects; and dry floodproofing for historic properties only.

<http://www.fema.gov/government/grant/srl/index.shtm>

#### **Staffing for Adequate Fire and Emergency Response Grants**

The purpose of the Staffing for Adequate Fire and Emergency Response (SAFER) grants is to award grants directly to volunteer, combination, and career fire departments to help the departments increase their cadre of firefighters. Ultimately, the goal is for SAFER grantees to enhance their ability to attain 24-hour staffing and thus assuring their communities have adequate protection from fire and fire-related hazards.

**Previous Activities Funded:** The SAFER grants have two activities that will help grantees attain this goal: 1) hiring of firefighters and 2) recruitment and retention of volunteer firefighters.

<http://www.firegrantsupport.com/safer/>

#### **Volunteer Fire Assistance Program**

The purpose of the Volunteer Fire Assistance (VFA) Program, formerly known as the Rural Community Fire Protection (RCFP) Program, is to provide Federal financial, technical, and other assistance to State foresters to train, and equip fire departments in rural areas and rural communities to prevent and suppress fires. A rural community is defined as having 10,000 or less population. This 10,000-population limit for participation in the VFA Program facilitates distribution of available VFA funding to the most

needy fire departments. The funding must be matched on a 50-50% basis by non-federal dollars or in-kind.

**Previous Activities Funded:** Purchase of Self Contained Breathing Apparatus, Protective clothing, installation of dry hydrants, and training for volunteer fire fighters.

[www.fs.fed.us/fire/planning/vfa](http://www.fs.fed.us/fire/planning/vfa)

#### **Weatherization Assistance Program**

Indiana's Weatherization Assistance Program provides residential energy conservation services to the low income citizens of Indiana. Funding comes from federal sources and is allocated to Community Action Agencies (CAA) to provide services in each of Indiana's 92 counties. The CAAs use their own crews or private contractors to provide comprehensive energy conservation services.

**Previous Activities Funded:** A thorough evaluation of the structures, including the safe and efficient operation of the furnace and water heater, is included in the treatment of each home.

<http://www.in.gov/fssa/families/housing/wap.html>

#### **Wetland Reserve Program**

The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.

**Previous Activities Funded:** The USDA Natural Resources Conservation Service (NRCS) provides technical and financial support to help landowners with their wetland restoration efforts.

<http://www.nrcs.usda.gov/programs/wrp/>

#### **Wildlife Habitat Incentive Program**

The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed.

**Previous Activities Funded:** Development of areas primarily targeted for wildlife habitat also serve as beneficial areas for flood mitigation activities such as wetland construction/restoration, native grass plantings, and filter area establishment.

<http://www.nrcs.usda.gov/programs/whip/>

**APPENDIX 9      CRS CHECKLIST**

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510 FLOODPLAIN MANAGEMENT PLANNING  
 CRS Checklist - from Activity Worksheet 510-1 and CRS Coordinator's Manual

CRS 10-Step Planning Process	Max. Points	Est. Points	Comments
<b>1. Organize and Prepare the Plan</b>	<b>10</b>	<b>8</b>	
Supervision or direction of a professional planner	2	2	Sheila McKinley, CBBEL Project Manager AICP #017260
Planning committee of department staff	6	6	Table 1-1 lists Planning Committee name, title, and department/agency represented
Process formally created by the community's governing board	2	0	
<b>2. Involve the Public</b>	<b>85</b>	<b>55</b>	
Planning process conducted through a planning committee	40	40	Appendix 2 contains Planning Committee meeting agendas and summaries; Planning Committee reviewed draft MHMP, attended public meeting, and assisted with local adoption
Public meetings held at the beginning of the planning process	15	0	
Public meeting held on the draft plan	15	15	Full draft, presented to the public; draft plan made available for public review on webpage, EMA office, Planning Office
Questionnaires asks the public for information	5	0	
Recommendations are solicited from advisory groups, etc.	5	0	
Other public information activities to encourage input	5	0	
<b>3. Coordinate With Other Agencies</b>	<b>25</b>	<b>21</b>	
Review of existing studies and plans (required)	3	3	Conducted a Community Capability Assessment to better understand existing mitigation programs, policies, and projects
Invited neighboring communities and other agencies (required)	1	1	Appendix 3 includes the invitation sent to the surrounding County EMA Directors; IDNR and IDHS involved in planning process
Contacted communities and NFIP and EM agencies	4	4	NFIP Floodplain Administrators participated as Planning Committee members
NWS, ARC and others are asked how they can help community	4	0	
Meetings are held with agencies on mitigation strategies	10	10	IDHS Mitigation Officer participated in the Planning Committee meeting where Mitigation Practices were identified and implementation steps discussed
Draft action plan sent to agencies for comments	3	3	Draft MHMP made available for IDNR and IDHS to review and comment
<b>4. Assess the Hazard</b>	<b>20</b>	<b>20</b>	
Map of known flood hazards	5	5	Exhibit illustrates FIRM floodplains as well as the location of critical facilities.
Description of known flood hazards	5	5	Section 3 discusses areas with a known localized flooding issue as well as floodplains; Table shows potential losses of structures located within floodplains
Discussion of past floods	5	5	Section provides an overview of the most recent floods of note as identified by the Planning Committee, local media sources, and NDCDC data; Table shows Repetitive Loss numbers; Table shows flood insurance claims
Describes other natural hazards (required DMA)	5	5	Section includes information related to Drought; Earthquake; Extreme Temperatures; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado; Snow Storm and Ice; Dam Failure; Hazardous Materials
<b>5. Assess the Problem</b>	<b>35</b>	<b>30</b>	
Summary of hazard and impact on community (required)	2	2	Section 3.0 includes Historic Data and Vulnerability Assessment for each hazard (Drought; Earthquake; Extreme Temperatures; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado; Snow Storm and Ice; Dam Failure; Hazardous Materials)
Procedures for warning and evacuation	5	5	Section 4 "Emergency Services", "Public Information", and Table 4-1 "Emergency Warning Systems" and "Emergency Response & Recovery" identifies existing and proposed systems for early warning and detection
Impact on critical facilities and infrastructure	5	5	Section 3.0 includes a Vulnerability Assessment for each hazard (Drought; Earthquake; Extreme Temperatures; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado; Snow Storm and Ice; Dam Failure; Hazardous Materials) that specifies (where possible) the number of critical facilities that would be impacted

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CRS 10-Step Planning Process	Max. Points	Est. Points	Comments
Impact on community's economy and tax base	5	0	
Number and types of buildings subject to the hazards	5	5	Section 3.0 includes a Vulnerability Assessment for each hazard (Drought; Earthquake; Extreme Temperatures; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado ; Snow Storm and Ice; Dam Failure; Hazardous Materials) that specifies (where possible) the number of critical facilities that would be impacted
Review of all flood insurance claims	4	4	Table list flood insurance claims
Natural and beneficial function of natural areas	4	4	Section 3 discusses the natural and beneficial function of floodplains for flood storage
Development, redevelopment, and population trends	5	5	Section 2 discusses population and demographics
6. Set Goals	2	2	Section 4.1 list goal for MHMP - to reduce social, physical, and economic losses from hazards
7. Review Possible Activities	30	30	
Preventive activities	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Preventive
Property protection activities	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Property Protection
Natural resource protection activities	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Natural Resource Protection
Emergency services activities	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Emergency Services
Structural projects	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Structural Projects
Public information activities	5	5	Section 4.2.1 discusses existing Mitigation Practices; Table 4-1 lists proposed Mitigation Practices for Public Information
8. Draft Action Plan	70	60	
Recommendations for activities 2 of 6 categories from #7 (prioritized)	10	0	
Recommendations for activities 3 of 6 categories from #7 (prioritized)	20	0	
Recommendations for activities 4 of 6 categories from #7 (prioritized)	30	0	
Recommendations for activities 5 of 6 categories from #7s (prioritized)	45	45	Table 4-1 lists and prioritizes proposed Mitigation Practices for all 6 possible activities (Prevention, Property Protection, Natural Resource Protection, Emergency Services, Structural Projects, and Public Information); Section 5.0 includes an Implementation Plan for High Priority Mitigation Practices
Post-disaster mitigation policies and procedures	10	10	Section 6.1 recommends the County Surveyor reassemble the Planning Committee following a significant hazard incident to review the effectiveness of existing Mitigation Practices and make recommendations for improvement
Recommendations from Habitat Conservation Plan	10	0	
Action items for mitigation other hazards	5	5	Table 4-1 includes Mitigation Practices for Drought; Earthquake; Extreme Temperatures; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado ; Snow Storm and Ice; Dam Failure; Hazardous Materials; Section 5.0 includes an Implementation Plan for High Priority Mitigation Practices
9. Adopt the Plan	2	0	
10. Implement, Evaluate and Revise	15	15	
Procedures to monitor and recommend revisions (required)	5	5	Section 6.1 includes a process to monitor, evaluate, and update the MHMP; effort to be led by County Surveyor
Plan evaluated by same (or equally qualified) planning committee	10	10	Section 6.1 acknowledges that the successful implementation of the Mitigation Practices identified in this MHMP will require cooperation and participation of entire Planning Committee.
<b>FLOODPLAIN MANAGEMENT PLAN</b>	<b>294</b>	<b>241</b>	
REPETITIVE LOSS AREA ANALYSIS	50	0	
HABITAT CONSERVATION PLAN	15	0	
<b>TOTAL</b>	<b>359</b>	<b>241</b>	