2015

Multi-Hazard Mitigation Plan

Wells County, Indiana

Wabash River in Bluffton, Indiana, July 1998
Source: http://www.weather.gov

Multi-Hazard Mitigation Plan

Wells County, Indiana

Original Adoption Date: 2007
Updated: 2015

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Acknowledgments

Wells County's multi-hazard mitigation plan was developed in 2007 by the Wells County Emergency Management Agency (EMA) and updated in 2014-2015 by The Polis Center at IUPUI. The Wells County EMA would like to thank The Polis Center and the planning team for their contributions and assistance in development of a plan that will help the county to continue to build its capacity to prevent, protect against, respond to, and recover from disasters.

Wells County Emergency Management Agency would also like to recognize Maumee River Basin Commission (MRBC) as a partner in this multi-jurisdictional planning effort. MRBC provides regional leadership and promotion of flood control, soil and water conservation, and related resource management through a coordinated and comprehensive planning and implementation approach.

Acronyms

AEGL - Acute Exposure Guideline Levels
ALOHA - Areal Locations of Hazardous Atmospheres
BFE - Base Flood Elevation
CAMEO – Computer-Aided Management of Emergency Operations
CAPI – Community Action Potential Index
CEMP – Comprehensive Emergency Management Plan
CRS – Community Rating System
DEM – Digital Elevation Model
DFIRM – Digital Flood Insurance Rate Map
DHS – Department of Homeland Security
DMA – Disaster Mitigation Act
EAP – Emergency Action Plan
EMA – Emergency Management Agency
EPA – Environmental Protection Agency
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Maps
GIS – Geographic Information System
Hazus-MH – Hazards USA Multi-Hazard
HUC – Hydrologic Unit Code
IDEM – Indiana Department of Environmental Management
IDHS – Indiana Department of Homeland Security
INDOT – Indiana Department of Transportation
IDNR – Indiana Department of Natural Resources
IGS – Indiana Geological Survey
MHMP – Multi-Hazard Mitigation Plan
MRBC – Maumee River Basin Commission
NCDC – National Climatic Data Center
NEHRP – National Earthquake Hazards Reduction Program
NFIP – National Flood Insurance Program
NOAA – National Oceanic and Atmospheric Administration
NWS – National Weather Service
PPM – Parts Per Million
SPC – Storm Prediction Center
USACE – United States Army Corps of Engineers
USDA – United States Department of Agriculture
USGS – United States Geological Survey

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Executive Summary

The Wells County Multi-Hazard Mitigation Plan was developed to guide the county in a risk-based approach to preventing, protecting against, responding to, and recovering from disasters that may threaten the county's citizens, infrastructure, and economy. The plan is hazard- and community-specific. It documents historical disasters, assesses probabilistic disasters through Hazus-MH and GIS analyses, and addresses specific strategies to mitigate the potential impacts of these disasters.

This five-year update was a collaborative effort among the Wells County planning team, The Polis Center of Indiana University Purdue University-Indianapolis, and Maumee River Basin Commission (MRBC). Maumee River Basin Commission, a six-county regional flood-hazard mitigation organization, was established by the Indiana General Assembly to reduce the impact of floods on life and property through public education, watershed management, and working with local communities to improve floodplain mapping. Additionally, MRBC is partnering with local communities in the acquisition and removal of at-risk structures and other flood mitigation projects.

The team updated the following content in the plan:

- Historical hazards: Each hazard section within this plan documents the most current data about NCDC-reported hazards since the 2007 plan.
- Profile Hazards: The planning team revised the hazard priority rankings and plotted each hazard on a risk grid according to probability (y-axis) and potential impact (x-axis). County planning documents, e.g. Risk MAP reports, CEMP, hazard-specific reports, response and recovery reports, etc, were integrated into the plan update.
- Community profile: Demographics, social, and economic data, as well as existing and future land use descriptions were updated to reflect the current status of the county and its jurisdictions.
- NFIP: The plan includes the effective date of the DFIRM as well as a new NFIP analysis of the county's flood risk.
- Planning description: The new planning team and updated planning process were described and documented.
- Risk assessment: Hazus-MH and GIS analyses were updated using site-specific data from the county. Updated loss estimation is provided for tornadoes, floods, earthquakes, and hazardous materials releases.
- Mitigation: The team reviewed and updated mitigation goals, objectives, and strategies.

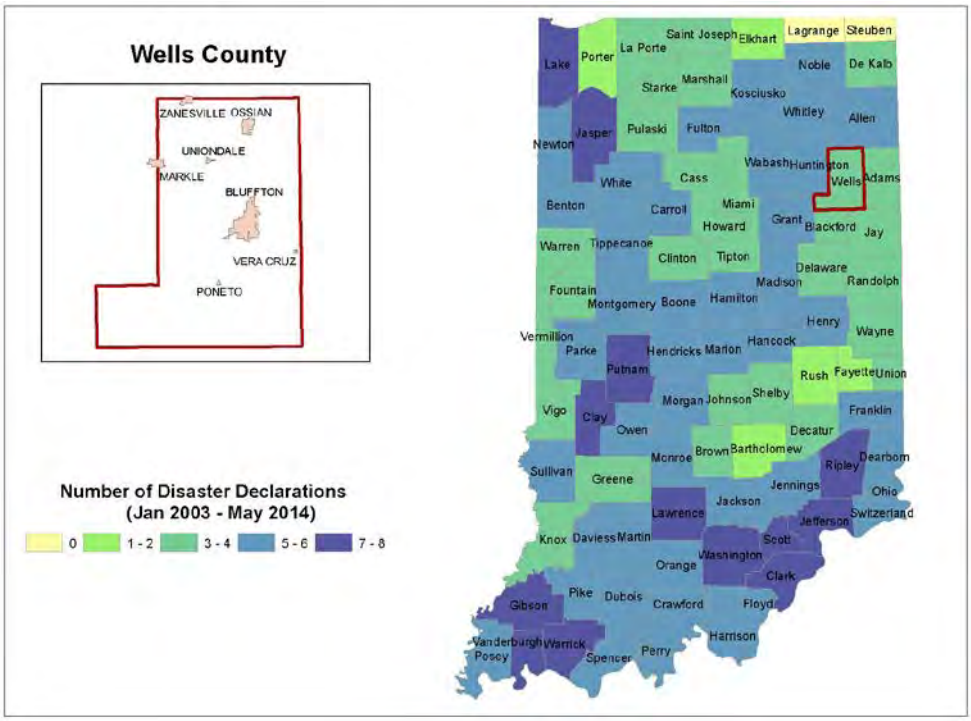
Section 1 Introduction

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

The federal Disaster Mitigation Act of 2000 requires jurisdictions to develop and maintain a Multi-Hazard Mitigation Plan (MHMP) to remain eligible for certain federal disaster assistance and hazard mitigation funding programs. Renewal of the plan every five years is required to encourage the continual awareness of mitigation strategies. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt the MHMP.

In the past decade, FEMA has declared 18 emergencies and disasters for the state of Indiana in the past decade.

Figure 1: Disaster Declarations for Indiana[1]



[1] Federal Emergency Management Agency, 2014

In the event of a federally declared disaster, individuals, families, and businesses may apply for financial assistance to help with critical expenses. Assistance may be categorized as Individual Assistance (IA), Public Assistance (PA), or Hazard Mitigation Assistance (HMA).

The following types of assistance may be available in the event of a disaster declaration.

Individuals & Household Program: Provides money and services to people in presidentially declared disaster areas.

Housing Assistance: Provides assistance for disaster-related housing needs.

Other Needs Assistance: Provides assistance for other disaster-related needs such as furnishings, transportation, and medical expenses.

Public Assistance: Disaster grant assistance available for communities to quickly respond to and recover from major disasters or emergencies declared by the president.

Emergency Work (Categories A-B): Work that must be performed to reduce or eliminate an immediate threat to life, to protect public health and safety, and to protect improved property that is significantly threatened due to disasters or emergencies declared by the president.

Permanent Work (Categories C-G): Work that is required to restore a damaged facility, through repair or restoration, to its pre-disaster design, function, and capacity in accordance with applicable codes and standards.

Hazard Mitigation Assistance: Provides assistance to states and local governments through the Hazard Mitigation Grant Program (HMGP) to implement long-term hazard mitigation measures after a major disaster declaration.

Wells County has received federal aid for four declared disasters since 2004.

Table 1: FEMA-Declared Disasters and Emergencies for Wells County (2004-2014)[2]

Disaster Number	Date of Incident	Date of Declaration	Disaster Description	Type of Assistance
DR-1520	5/25/2004-6/25-2004	6/3/2004	Severe Storms, Tornadoes, and Flooding	IA, PA, HMGP
DR-1573	1/1/2005-2/11/2005	1/21/2005	Severe Winter Storms and Flooding	IA, PA, HMGP
EM-3238	8/29/2005-10/1/2005	9/10/2005	Hurricane Katrina Evacuation	PA, HMGP
EM-3274	2/12/2007-2/14/2007	3/12/2007	Snow	PA, HMGP

PA – Public Assistance Program
IA – Individual Assistance Program
HMGP – Hazard Mitigation Grant Program

[2] Disaster declarations with multiple hazards may be regional and all hazards may not impact every community/county in the declaration.

Section 2

Prerequisites

The 2015 Wells County Multi-Hazard Mitigation Plan meets the requirements of the Disaster Mitigation Act of 2000, which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act to require state, local, and tribal entities to closely coordinate mitigation planning and implementation efforts. It also meets the requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) grant program, Pre-Disaster Mitigation (PDM) grant program, and other National Flood Insurance Program (NFIP) grants.

2.1 Multi-Jurisdictional Plan Adoption

This plan represents a comprehensive description of Wells County's commitment to significantly reduce or eliminate the potential impacts of disasters through planning and mitigation. Adoption by the local governing bodies within the county legitimizes the plan and authorizes responsible agencies to implement mitigation responsibilities and activities.

To be eligible for federal mitigation funding, each participating jurisdiction must adopt the plan. After thorough review, the Wells County Board of Commissioners adopted the plan on <date adopted>. Additional adoptions are included in Appendix G.

2.2 Jurisdiction Participation

Table 2 lists each jurisdiction and describes its participation status in 2007 and 2015. The Wells County EMA invited representatives from each jurisdiction to participate in the planning process. All communities were encouraged participate in meetings, comment on issues and actions, and review the draft plan. Jurisdictions were also invited to come to the EMA office to review and discuss the plan at their convenience. Distribution information is included in Appendix B. Table 2 lists each jurisdiction and describes its participation status in 2007 and 2015.

Table 2: Participating Jurisdictions

Jurisdiction Name	Type	Participated 2007 Plan	Participated 2015 Plan
Wells County	County	Yes	Yes
Bluffton	City	Yes	Yes
Markle	Village	Yes	Yes
Ossian	Town	No	Yes
Poneto	Town	Yes	Yes
Uniondale	Town	Yes	Yes
Vera Cruz	Town	Yes	Yes
Zanesville	Town	Yes	Yes

The county also invited representatives from local businesses and organizations to participate in the plan. Table 3 lists additional team members with a description of their participation. The invitations are included in Appendix A.

Table 3: Organizations Invited to Participate

Organization Name	Organization Type	Representative	Description of Participation
Indiana-Michigan Power	Utility	Rob Cleveland	Attended planning meeting and provided input
Purdue Extension	Education	Chuck King	Attended planning meeting and provided input
Red Cross	Disaster Relief	Jeri Elliott	Invited to attend planning meetings

Section 3

Planning Process

The Wells County EMA, The Polis Center (Polis), and Maumee River Basin Commission (MRBC) have joined efforts to develop this five-year plan update. The planning process consisted of the following tasks:

Task 1: Organize Resources

The Wells County EMA created a planning team to attend meetings, gather data and historical information, and participate in mitigation brainstorming sessions.

Task 2: Risk Assessment

The planning team identified the natural and technological hazards to include in this plan, and Polis developed hazard event profiles to address the possible magnitudes and severities associated with each hazard. The team then used local resources to inventory the county's assets and estimate losses.

Task 3: Develop Mitigation Strategies

Polis led a brainstorming session with the planning team to develop and prioritize mitigation strategies and action items that would reduce the costs of disaster response and recovery, protect people and infrastructure, and minimize overall disruption to the county in the event of a disaster. The team started by reviewing and evaluating the progress of the 2007 strategies, and then developed and prioritized new strategies.

Task 4: Public Involvement

The public was invited to attend a meeting to review the draft plan and provide input. The meeting was announced via a press release and email invitations were sent to specific community leaders.

Task 5: Complete the Plan

Polis compiled all of the planning team documentation and research with the risk assessment and mitigation strategies to produce a draft plan for review. The Wells County planning team had multiple opportunities to review and revise the plan before submitting to the Indiana Department of Homeland Security and FEMA for approval.

Task 6: Plan Adoption

The Wells County EMA coordinated the effort to collect adoptions from each participating jurisdiction.

3.1 Planning Team Information

The planning team is headed by the Wells County EMA. Other members of the planning team include representatives from various county departments, cities and towns, and public and private utilities. All members of the planning committee were actively involved in attending the MHMP meetings, providing available Geographic Information Systems (GIS) data and historical hazard information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and coordinating the county's formal adoption of the plan.

Table 4 identifies the planning team individuals and the organization that they represent.

Table 4: Multi-Hazard Mitigation Planning Team Members in Attendance

Name	Title	Organization	Jurisdiction
Wayne Grove	Director	Wells County EMA	Wells County
Rick Velasquez	Deputy Director	Wells County EMA	Wells County
Jarrod Hahn	Surveyor	Wells County Surveyor	Wells County
Rick Dolsen	District 3 Coordinator	IDHS	IDHS District 3
Mike Lautzenheiser	GIS Manager	Wells County GIS Office	Wells County
Diana Collins	Deputy Surveyor	Wells County Surveyor	Wells County
Christopher M. Broderick	Chief	Bluffton Fire Department	City of Bluffton
James Van Winkle	President	Wells County Council/EMA	Wells County
Rick Piepenbrink	Director	Wells County EMS	Wells County
Roy Johnson	County Attorney	Wells County	Wells County
Blake Gerber	Commissioner	Wells County Commissioners	Wells County
Nathan Huss	Chief	Bluffton Police Department	City of Bluffton
Rod Renkenberger	Executive Director	Maumee River Basin Commission	Maumee River Basin Commission (Regional/Quasi-State)
Chuck King	County Councilman	Wells County Council	Wells County
Toby Steffen		Wells County Highway Dept	Wells County
Roy Schoeff	Clerk-Treasurer	Poneto	Poneto
Monte Fisher	Sheriff	Wells County Sheriff Dept	Wells County

The planning team held three meetings during the planning process. The dates and goals of these meetings are as follows.

Meeting 1, September 30, 2014:

- Introduce/overview of project
- Review and update facility data
- Review and prioritize hazards
- Determine modeling scenarios
- Distribute 2007 mitigation strategies

Meeting 2, January 6, 2015:

- Introduction and overview for new attendees
- Review risk assessment
- Review draft plan
- Discuss 2007 and 2015 mitigation strategies

Meeting 3 (PUBLIC MEETING), April 1, 2015

- Review draft plan
- Add/modify mitigation strategies
- Address public questions and concerns

3.2 Review of Existing Plans

Wells County and the local communities utilize land use plans, emergency response plans, municipal ordinances, and building codes to direct community development. The planning process also incorporated the existing natural hazard mitigation elements from these previous planning efforts. The development of the plan utilized the following plans, studies, reports, and ordinances. Table 5 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 5: Planning Documents Used for 2014 MHMP Planning Process

Title	Year	Description	Where Used
Wells County Mitigation Plan	2007	Federal Disaster Mitigation Act requirement	Throughout
Community Action Potential Index	2013	FEMA Region V Risk Analysis Branch of the Mitigation Division methodology for ranking communities for Risk MAP Actions	Section 5: Risk Assessment; Section 6: Mitigation Strategies
Risk MAP Resilience Report	2012	FEMA report for Wells County, Bluffton, Markle, Ossian, Poneto, Uniondale, Vera Cruz	Section 5: Risk Assessment; Section 6: Mitigation Strategies
Wells County Zoning and Floodplain Management Ordinance	2008	Description of various county ordinances	Section 6: Mitigation Strategies
Wells County Comprehensive Plan	2014	Guide for decision making in the county for the next 10 years	Section 4: County Profile; Section 5: Risk Assessment; Section 6: Mitigation Strategies
Maumee River Basin Commission Flood Mitigation Master Plan	2014	Recommendations for flood mitigation activities in the Maumee River Basin	Section 5: Risk Assessment; Section 6: Mitigation Strategies

3.3 Review of Technical and Fiscal Resources

The MHMP planning team has identified representatives from key agencies to assist in the planning process. Technical data, reports, and studies were obtained from these agencies. The organizations and their contributions are summarized in Table 6.

Table 6: Key Agency Resources Provided

Resources Provided	Source
Repetitive loss information	FEMA Region V
Digital flood maps, dam and levee information	FEMA Region V
GIS data, digital elevation models (DEM), earthquake modeling scenarios	Indiana Geological Survey
2007 Wells County MHMP	Wells County Emergency Management Agency
Critical Facility GIS data and GIS basemap data	Wells County Surveyor
Community Action Potential Index (CAPI) data	FEMA Region V
Major employer information, land use and development	Chamber of Commerce Economic Development
Economic and community development, ag business, land use	Purdue Extension
MRBC Model Floodplain, Stormwater Management Ordinances	Maumee River Basin Commission

3.4 Public Involvement

The planning team invited the public to a meeting on April 1, 2015 in order to encourage the public to actively participate in the planning process. During this meeting the Polis Center reiterated the purpose of the plan and goals of the meeting. The draft plan was reviewed and mitigation strategies were discussed. All attendees were given the opportunity to actively participate. Appendix A includes meeting minutes and invitations to participate. Appendix B includes the published announcement of the meeting.

3.5 Neighboring Community Involvement

The Wells County planning team invited neighboring counties to review the draft plan and provide input on content, including mitigation strategies. Details of neighboring stakeholders' involvement are summarized in Table 7 and documented in Appendix A.

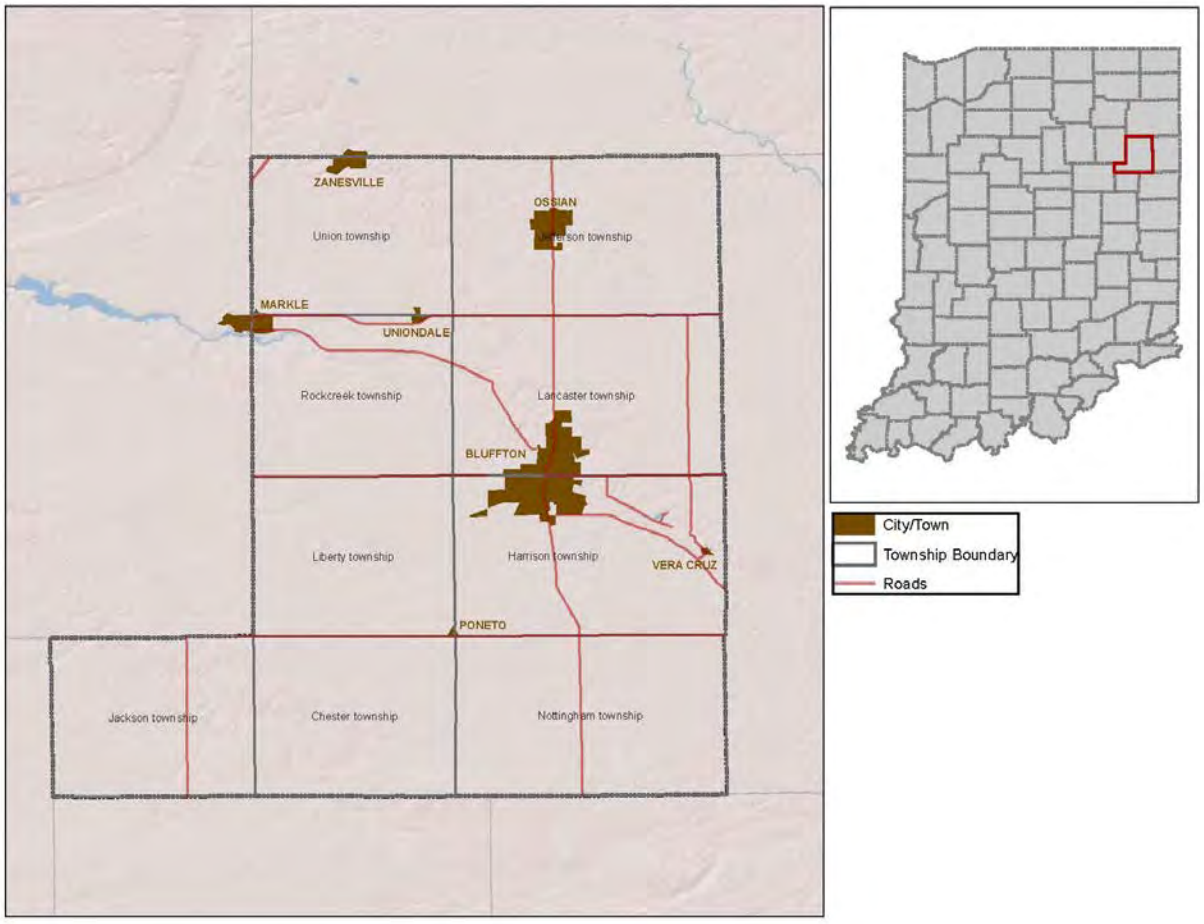
Table 7: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Brad Witte	Allen County, IN	Allen County EMA	Was provided copy of draft plan
John August	Adams County, IN	Adams County EMA	Was provided copy of draft plan
Aaron Henderson	Blackford County, IN	Blackford County EMA	Was provided copy of draft plan
Bruce Bender	Grant County, IN	Grant County EMA	Was provided copy of draft plan
Lindsie Goss	Huntington County, IN	Huntington County EMA	Reviewed draft plan and provided feedback
Ralph Frazee	Jay County, IN	Jay County EMA	Reviewed draft plan and provided feedback

Section 4 County Profile

As shown in Figure 2, Wells County is located in east-central Indiana near the Indiana-Ohio state line.

Figure 2: Wells County, Indiana Location



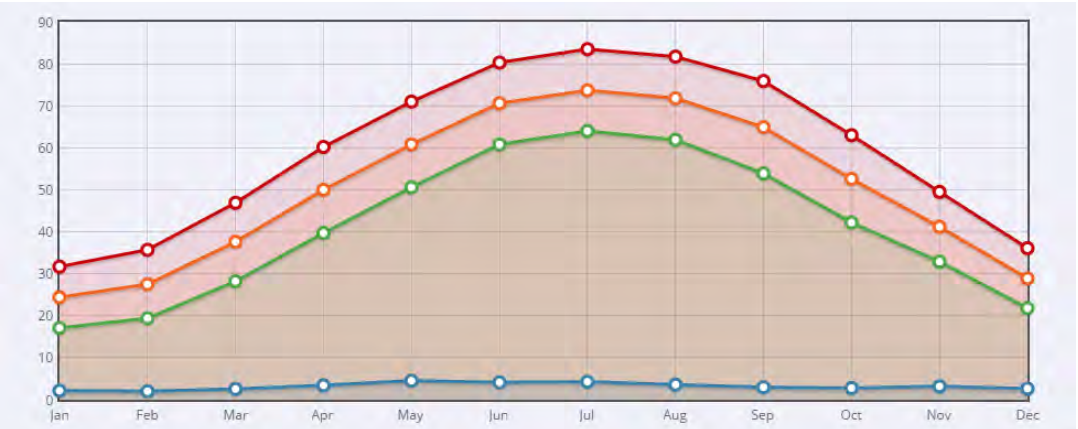
The county is comprised of the City of Bluffton, the Towns of Ossian, Poneto, Uniondale, Vera Cruz, and Zanesville, and the Village of Markle. These communities are distributed across nine townships, which include Chester, Harrison, Jackson, Jefferson, Lancaster, Liberty, Nottingham, Rockcreek, and Union. There are numerous unincorporated communities throughout Wells County. The City of Bluffton is the county seat.

4.1 Geography, Topography, and Climate

Wells County is located in the east-central part Indiana. The central part of the county contains approximately 40% of the total population, which is centralized in the City of Bluffton, and the southern part of the county is extremely rural. The county has a total area of 372 square miles of which approximately 368 square miles (98.9%) is land and 2 square miles is water. Most of the county has a level surface, broken slightly by sloping landscapes along rivers, creeks, and their tributaries. Wells County has two major rivers: the Wabash River and the Salamonie River.

Wells County's climate is typical of central Indiana with average temperatures ranging from 24.5 degrees Fahrenheit in January and 74 degrees Fahrenheit in July. The wettest month of the year is typically May, and the driest month is February. Figure 3 charts the temperature and precipitation climate normals for Wells County as recorded in Bluffton[3].

Figure 3: Climate Norms for Wells County



MONTH	PRECIP (IN)	MIN TMP (°F)	AVG TMP (°F)	MAX TMP (°F)
01	2.16	17.1	24.4	31.7
02	2.03	19.4	27.5	35.7
03	2.56	28.2	37.6	46.9
04	3.43	39.7	50.0	60.2
05	4.54	50.6	60.8	71.0
06	4.13	60.8	70.6	80.3
07	4.28	64.0	73.7	83.5
08	3.60	61.9	71.8	81.7
09	2.96	53.9	64.9	75.9
10	2.79	42.2	52.6	63.0
11	3.18	32.9	41.2	49.5
12	2.66	21.8	28.9	36.1

[3] National Climatic Data Center, National Oceanic and Atmospheric Administration, http://www.ncdc.noaa.gov/cdo-web/datatools/normals

4.2 Demography

As of 2013[4], there were 27,814 people residing in Wells County, with a population density of 75.6 people per square mile. Wells County still remains a largely rural county with just over half of the population residing in the incorporated jurisdictions of Wells County. Table 8 shows the distribution of population for each community in the county.

Table 8: Population by Community

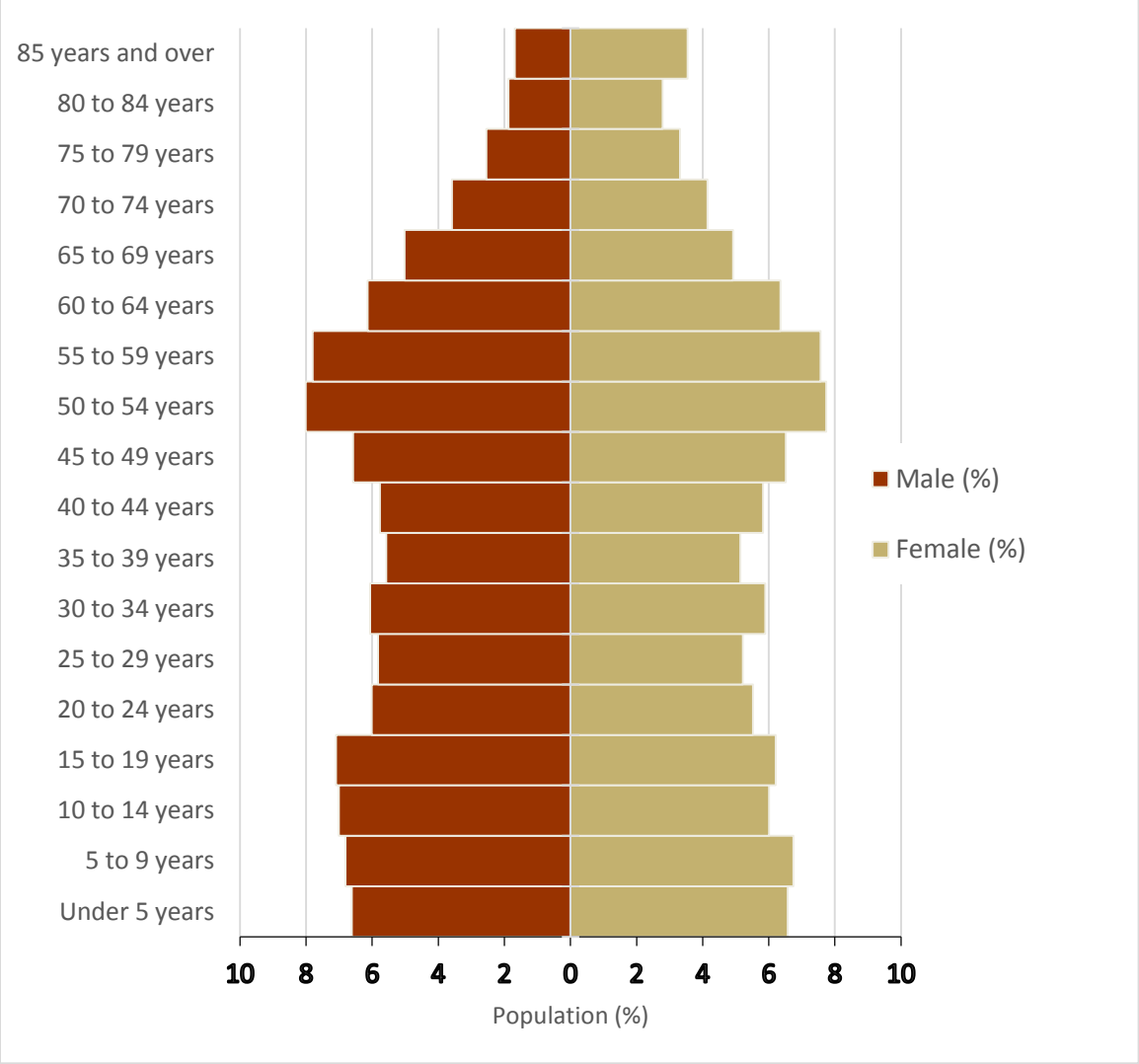
Community	2013 Population	% Total County Population
Wells County (unincorporated)	13,051	46.9
Bluffton	9,948	35.8
Markle*	167	0.6
Ossian	453	1.6
Poneto	81	0.3
Uniondale	311	1.1
Vera Cruz	477	1.7
Zanesville*	3,326	12.0

** These jurisdictions crosses county lines, but only population in Wells County is reported.*

The median age of Wells County residents is 40.9, compared to the Indiana median age of 37.4. Figure 4 on the following page shows Wells County's population pyramid, which illustrates the distribution of the county's population in terms of age groups and gender. Population pyramids are used to analyze growth or decline of fertility, mortality, and migration within the specified area. Wells County's population pyramid is relatively stable but indicates an aging population, apparent in the significant numbers of people aged 50 to 59 years old. This increase will continue to travel upward as that population ages.

[4] US Census Bureau, STATS Indiana

Figure 4: Wells County Population Pyramid[5]



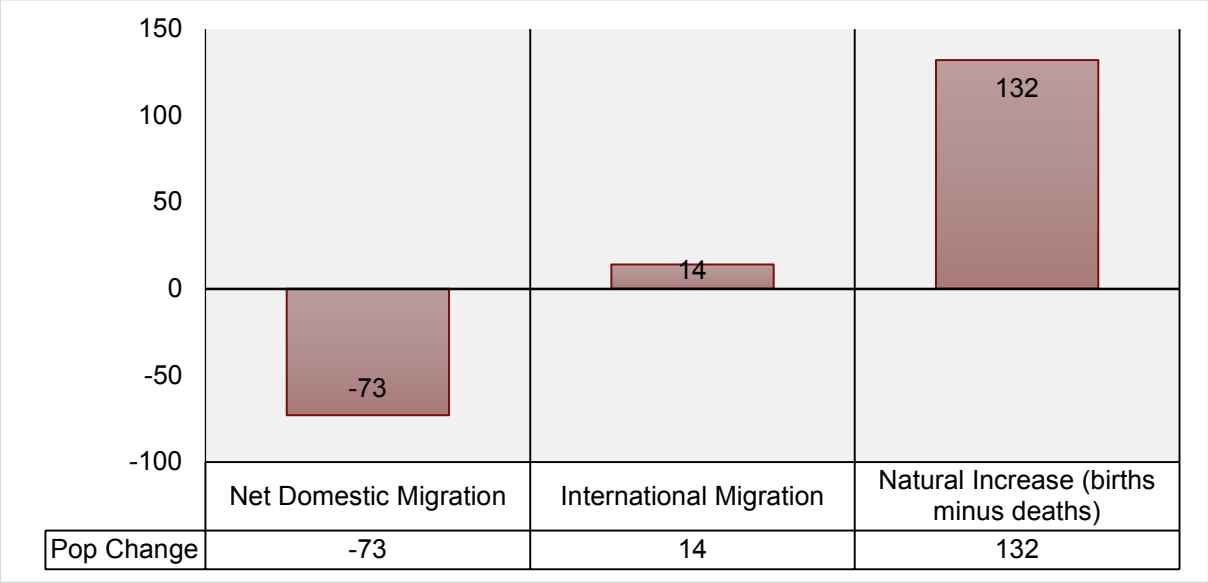
Wells County's population is 98.1% White, but it does have a small percentage of minority cultures and sub-cultures, which are important to consider in mitigation planning. The most predominant minority in Wells County is Black or African American, comprising 1.1% of the total population.

[5] American Community Survey 3-year estimate, 2010-2012

4.3 Population Change

Populations grow or decline through migration and natural increase, and often these two components offset each other. In the most recent census estimate (2013), Wells County registered a positive natural increase (meaning more people were born than died) and a negative net in-migration (meaning more people moved out of the county than into the county). [6] Figure 5 shows these components of population change.

Figure 5: Components of Population Change (2013)



The breakdown of population change by incorporated areas from 2000 to 2010 is listed in Table 9.

Table 9: Population Change by Community[7]

Community	2000 Population	2010 Population	% Population Change
Wells County (unincorporated)	12,845	12,199	-5.0%
Bluffton	9,536	9,897	3.8%
Markle	1,102	1,095	-0.6%
Ossian	2,943	3,289	11.8%
Poneto	240	166	-30.8%
Uniondale	277	310	11.9%
Vera Cruz	55	80	45.5%
Zanesville	602	600	-0.3%

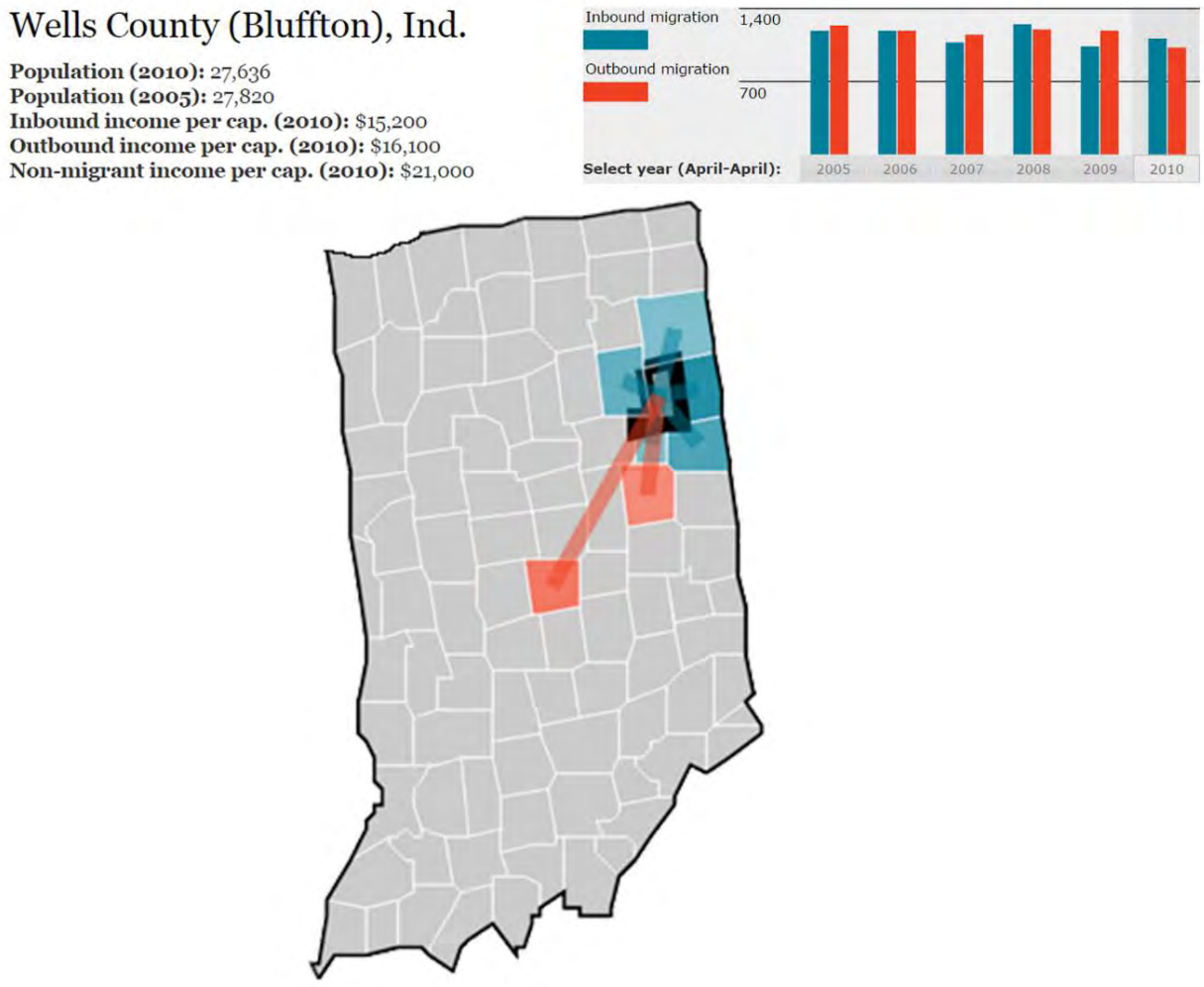
[6] STATS Indiana; US Census Bureau

[7] US Census Bureau

Migration trends inform hazard mitigation by highlighting areas of population growth and decline, revealing immigration and emigration patterns, and informing public officials of changes in net adjusted gross income (AGI) as a result of migration.

Figure 6, generated via Forbes American Migration Map, shows Wells County's migration patterns between 2005 and 2010 in terms of inbound and outbound domestic migration.

Figure 6: Wells County Migration Patterns (2005-2010)[8]



[8] Forbes, American Migration [Interactive Map], http://www.forbes.com/special-report/2011/migration.html

4.4 Special Needs Populations

Certain populations require special attention in mitigation planning because they may suffer more severely from the impacts of disasters. It is important to identify these populations and develop mitigation strategies to help them become more disaster-resilient. Although there are numerous types of vulnerable populations, Wells County has identified five significant groups, which include low-income citizens, older adults, people who don't speak English at home, people with disabilities, and people without high school diplomas.

We compared Wells County to nearby counties, as well as to Indiana, by averaging the percent population of each special needs category within the county/state. Of the eight geographies we compared (one state and seven counties), Wells County ranks eighth, meaning it has a relatively low special needs population, comparatively, of the assessed area.

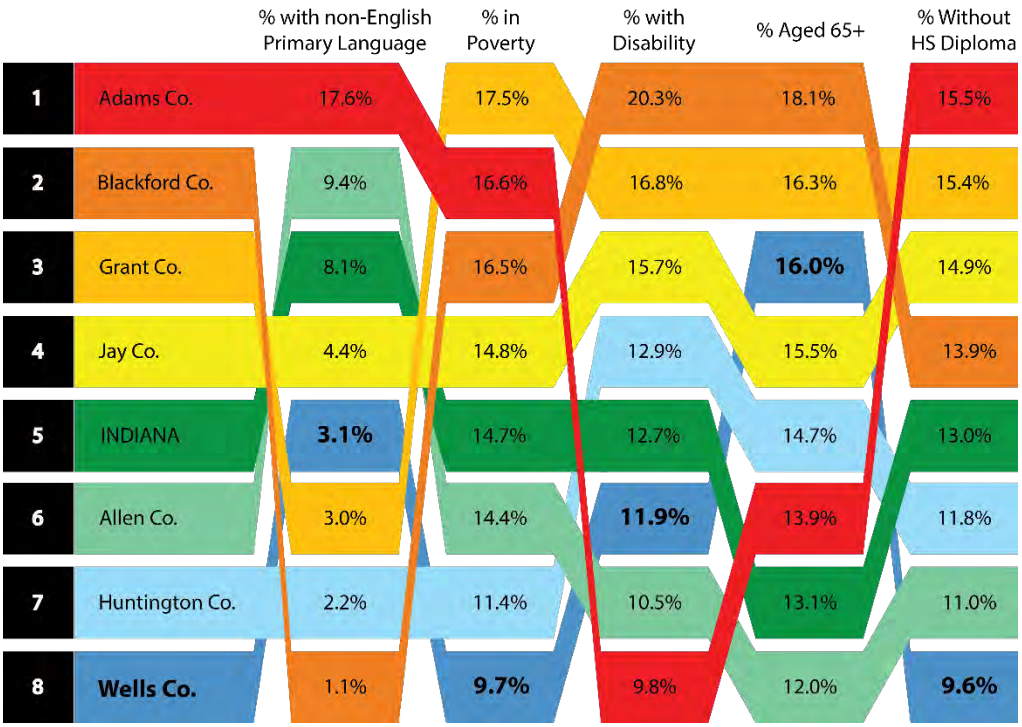
Figure 7 shows how each county/state compares overall and per special needs indicator. The purpose of the comparison is to highlight special needs populations for further analysis. It does not necessarily mean that those communities are the most vulnerable. For example, Adams County has the highest average of combined special needs indicators. This is due, however, to Adams County's significant Amish population, which may have special needs in terms of culture but is not necessarily a concern in terms of safety for emergency managers and first responders. More than 17% of Adams County's population speaks a language other than English at home. But while many Amish speak Pennsylvania Dutch or German at home, they are also fluent in English. Additionally, the high percentage of population without a high school diploma (15.5%) may be explained by the fact that many Amish children only attend school through grade eight.

The special needs indicator most significant in Wells County is the percent population aged 65 or older (16.0% of the county's total population). In the event of a disaster, elderly citizens have particular challenges and concerns. They may require life-sustaining medication, electricity-operated medical equipment, and special mobility assistance. They may also require special temporary housing needs that can accommodate physical disabilities/limitations and varied levels of income. Wells County emergency management and personnel can help to mitigate these vulnerabilities by participating in specialized training to deal effectively with elderly populations or offering resources to the public and elderly care facilities to empower them with knowledge and tools that could help them save their own lives.

Examples of activities to improve emergency mitigation and preparedness for the elderly population include, but is not limited to, the following:

- Evacuation exercises for communities and elderly care facilities
- Public materials on when and how to shelter in place
- Training for emergency shelter staff
- Development of resource guide for seniors with available housing, medical, and basic needs services
- Development of accessible media announcements

Figure 7: Special Needs Ranking Overall and by Indicator[9]



Explanation of Special Needs Indicators:

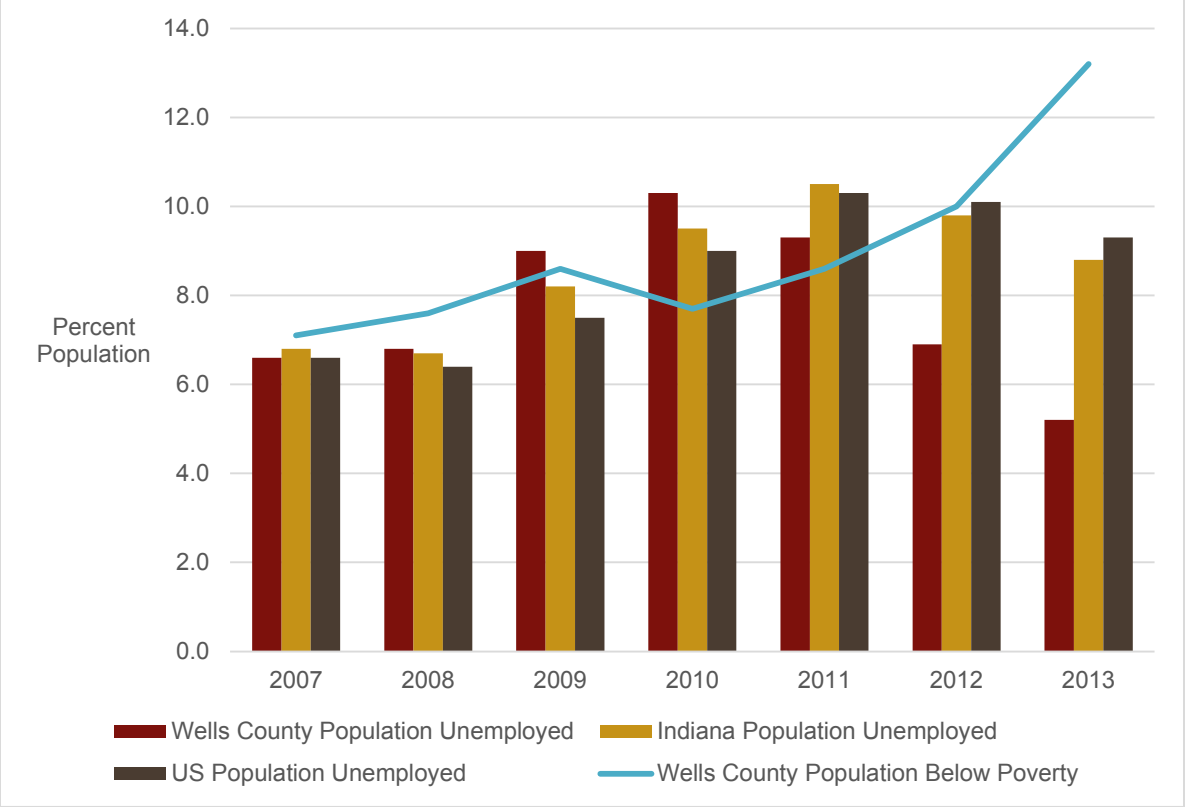
Percent population speaking language other than English at home
Percent of all people whose income in the last 12 months is below poverty level
Percent of population with a disability within the civilian non-institutionalized population
Percent of population age 65 and over
Percent of population with less than 9th grade educational attainment
AND percent of population 9th to 12th grade with no diploma

4.5 Income, Industry, and Economy

The annual per capita personal income in Wells County is $36,775 (3.6% lower than the state), and the median household income is $49,264 (4.7% higher than the state)[10]. The financial crisis of 2007-2008 had a similar impact in Wells County as it did in Indiana and the US, and from 2008 through 2010, the county's unemployment rate was greater than both the state and the nation. Figure 8 illustrates how the county's unemployed population has changed over time compared to Indiana and the US. It also shows the percent of Wells County's population below the poverty level.

[9] American Community Survey 5-year estimates, 2008-2012
[10] STATS Indiana, 2012

Figure 8: Wells County Population Unemployed and Below Poverty Level (2007-2013)[11]



Note about above chart:
Employment status reflects the percent population unemployed within the civilian labor force. The poverty level reflects the percentage of all people in Wells County whose income in the past 12 months was below the poverty level.

[11] American Community Survey 3-year estimates

The 2013 estimated annual per capita income in Wells County is $37,854, compared to an Indiana average of $24,048. STATS Indiana reported that 83.1% of the workforce in Wells County was employed in the private sector. The breakdown of employment by industry for the county's civilian employed population 16 year and over is included in Table 10.

Table 10: Employment by Industry[12]

Employment Sector	% of Employed Population
Agriculture, forestry, fishing and hunting, and mining	4.0%
Construction	4.5%
Manufacturing	26.8%
Wholesale trade	3.1%
Retail trade	11.8%
Transportation and warehousing, and utilities	9.1%
Information	2.3%
Finance and insurance, and real estate and rental and leasing	4.1%
Professional, scientific, and management, and administrative and waste management services	3.6%
Educational services, and health care and social assistance	16.4%
Arts, entertainment, and recreation, and accommodation and food services	6.1%
Other services, except public administration	6.0%
Public administration	2.3%

According to the Wells County Economic Development Corporation, Wells County has three primary (core) industries, which include advanced manufacturing (35 businesses), food processing (3 businesses), and transportation and logistics (8 businesses). The top ten major employers in terms of number of employees are listed in Table 11 on the following page. Table 12 lists the top ten non-manufacturing employers.

Peyton's Northern, a food warehouse and distribution center for the Kroger Company, is the largest employer in Wells County, employing over 1,000 people.

Source: Wells County Economic Development

[12] STATS Indiana, American Community Survey 3-year estimates (2011-2013)

Table 11: Top Manufacturing Employers of Wells County[13]

Company Name	Employees	Type of Business
Metaldyne	273	Tooled automotive parts & assembly
Bluffton Motor Works	271	Motors & generators
Pretzels, Inc.	243	Pretzels & other snack foods
Wayne Metals	230	Metal stamping & fabrication
Buckhorn	177	Packaging & material handling containers
TI Automotive Group	150	Fuel tank systems
Bluffton Rubber Co.	132	Plastic & rubber products
Inventure Foods	122	Snack foods
Almco Steel Products	100	Automotive stamping
Roembke Manufacturing & Design	65	Design & building of rubber molds

Table 12: Top Non-Manufacturing Employers of Wells County[14]

Company Name	Employees	Type of Business
Peyton's Northern	1,050	Food warehouse & distribution
Wal-Mart Supercenter	402	Discount/grocery store
Bluffton Regional Medical Center	333	Medical facility
Northern Wells Community Schools	300	School corporation
Bluffton-Harrison M.S.D.	200	School corporation
Ormsby Trucking	160	Trucking firm
First Fleet	150	Trucking firm
Caylor-Nickel Clinic	150	Physicians Group
Southern Wells Community Schools	140	School corporation
Christian Care Retirement Community	138	Retirement community

4.6 Commuter Patterns

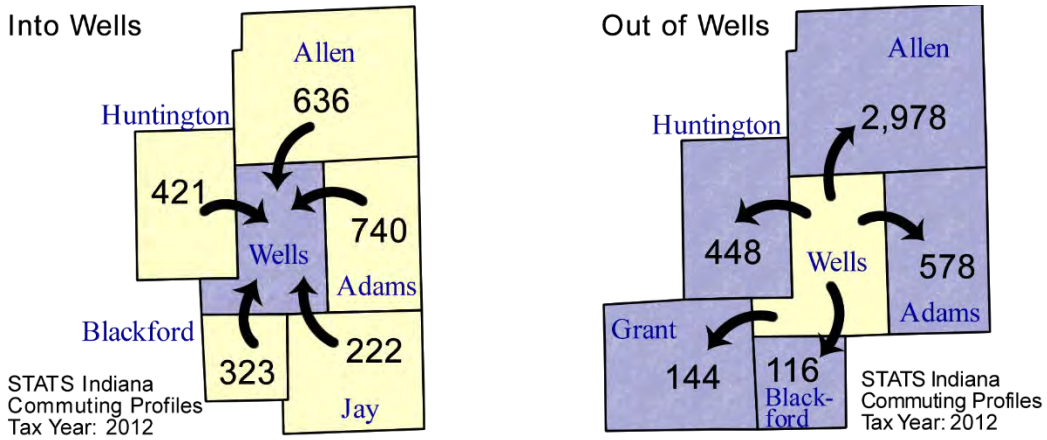
County-to-county commuting patterns provide a gauge of the economical connectivity of neighboring communities. The US Census reports that over 27% of US workers travel outside their residential county to travel to work.

According to Stats Indiana 2012 data, there are 19,002 people who live in Wells County and work (implied resident labor force). Of these residents, 4,810 (25.3%) work outside the county. An additional 2,722 people living in another counties commute to Wells County for work.

[13] http://www.wellsedc.com/data-center/top-10-employers/

[14] http://www.wellsedc.com/data-center/top-10-employers/

Figure 9: Commuting Patterns



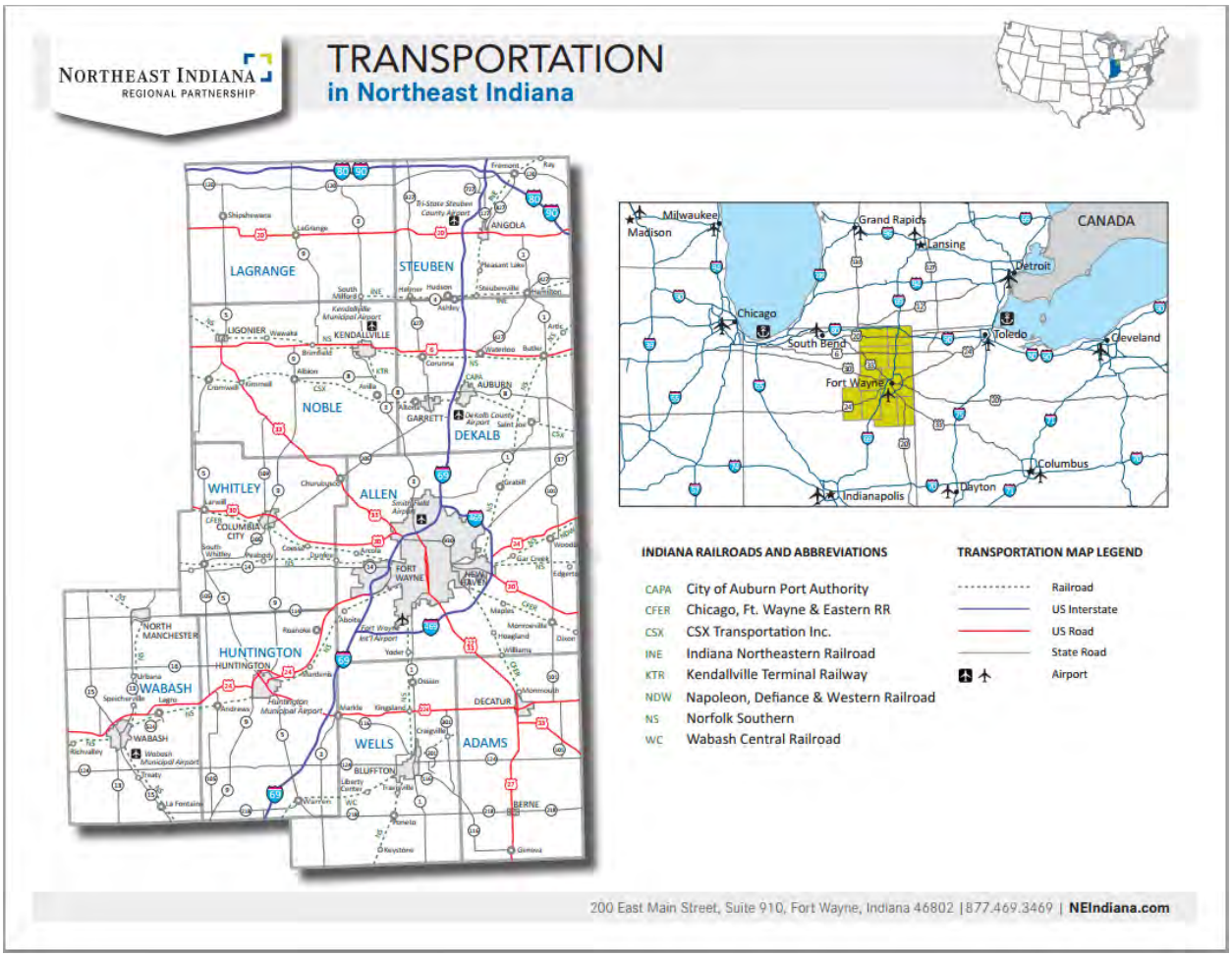
The average travel time to work in Wells County is 21.4 minutes compared to a 25-minute average in the US[15]. Commuter safety is an important consideration in disaster mitigation and planning. Employers can help their employees prepare by encouraging the development of Commuter Emergency Plans, such as the template developed by FEMA and available for download at http://www.fema.gov/media-library/assets/documents/90370.

4.7 Transportation

The Wells County Economic Development Corporation defines transportation as a leading economic asset for the county, primarily because of the region's proximity to a number of major metropolitan areas. Air transportation is available less than 20 minutes away at the Fort Wayne International Airport, and the Norfolk Southern and Wabash Central railroads offer easy access to rail transportation as well. Figure 10 illustrates transportation in Northeast Indiana.

[15] US Census American Community Survey 3-year estimate, 2011-2013

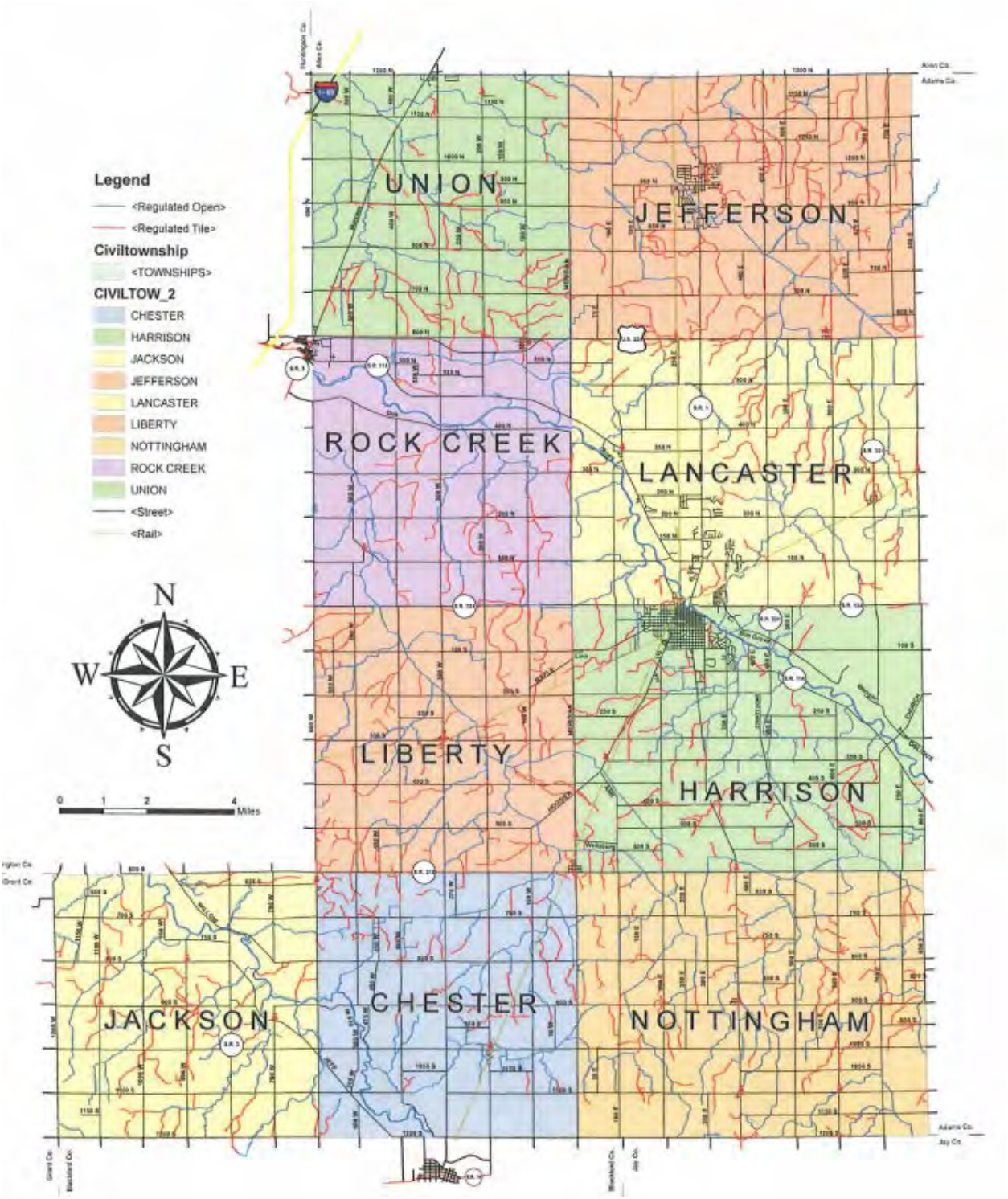
Figure 10: Transportation Map for Northeast Indiana



4.8 Major Waterways and Watersheds

Wells County has two major rivers: the Wabash River and the Salamonie River. Additionally, there are a total of 85 sub-watersheds within the county and 32 additional sub-watersheds jointly shared with surrounding counties, and there are over 455 miles of legal open drains and 392.5 miles of legal tiled drains contributing to the drainage basin of the county (Figure 11). The Indiana Department of Natural Resources estimates that approximately 20% of the county's land area is flood-prone.

Figure 11: Wells County Drainage Map

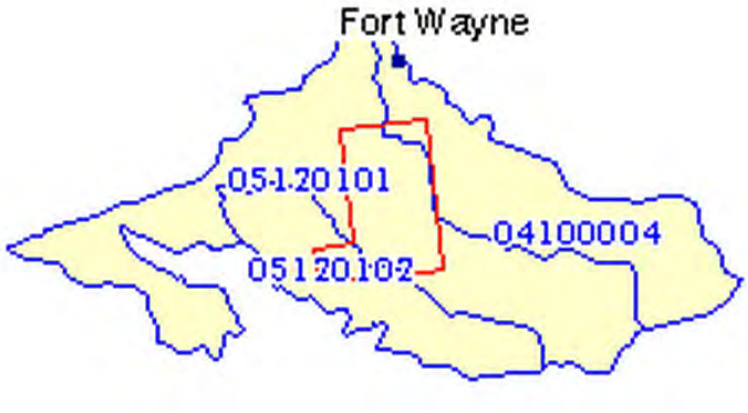


Wells County crosses three watersheds, listed in Table 13 and shown in Figure 12. The majority of the county is located in the Upper Wabash watershed.

Table 13: HUC 8 Watersheds of Wells County

Watershed	HUC 8	Primary Water Body
St. Mary's	04100004	Maumee River
Upper Wabash	05120101	Wabash River
Salamonie	05120102	Salamonie Creek

Figure 12: HUC 8 Watershed of Wells County[16]



4.9 Land-Use and Development Trends

Recent or proposed development, especially in Special Flood Hazard Areas (SFHAs), must be carefully evaluated to ensure that no adverse impacts occur as a result. Development, whether it is a 100-lot subdivision or a single lot big box commercial outlet, can result in large amounts of fill and other material being deposited in flood storage areas.

Wells County has had several new development projects in recent years. In 2014, the county broke ground on a 45,000 square foot industrial building at the northern edge of the Bluffton-Decker Industrial Park. It is expected that the building will attract new business to the area. Additionally, a new agribusiness manufacturer opened headquarters in Ossian Industrial Park in late 2014. The 30,000 square foot plant will expand the existing industrial area and potentially attract more residents and commuters to Wells County[17]

[16] US Environmental Protection Agency, Surf Your Watershed
[17] Wells County Economic Development, 2014

Section 5

Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on sound risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people.

This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of three components: 1) Hazard Identification, 2) Vulnerability Assessment, and 3) Risk Analysis and Hazard Profiling.

5.1 Identifying Hazards

5.1.1 Existing Plans

To facilitate the planning process, the planning team reviewed existing plans and data, including the 2007 Wells County Multi-Hazard Mitigation Plan and the current effective FEMA Flood Insurance Flood Maps (FIRMs).

The 2007 MHMP identified the following hazards ranked from most severe to least:

1. Flooding
2. Flash Flooding
3. Explosion/Fire
4. Tornado
5. Winter storms
6. Severe thunderstorms
7. Drought
8. Earthquake
9. Extreme temperatures
10. Hazardous material release

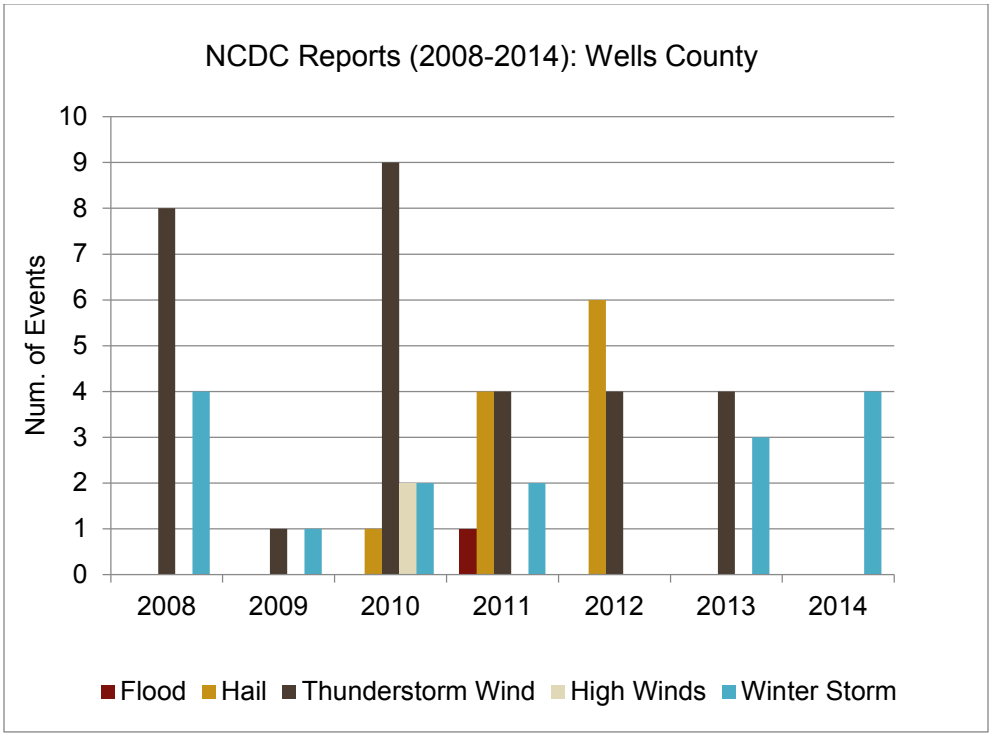
In 2014-2015, the planning team updated the county's top hazards to:

1. Flash flooding
2. Flooding
3. Severe thunderstorms
4. Extreme temperatures
5. Winter storms
6. Tornadoes
7. Explosion/Fire
8. Drought
9. Earthquake
10. Dam/levee failure
11. Hazardous materials release

5.1.2 Historical Hazards Records

To assist the planning team, historical storm-event data from the past six years was compiled from the National Climatic Data Center (NCDC). The NCDC Storm Events database includes events related to tornadoes, severe storms, floods, winter storms, droughts, and extreme temperatures. NCDC records are estimates of damage reported to the National Weather Service from various local, state, and federal sources. These estimates, however, are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events. The NCDC data included 75 reported events in Wells County between January 1, 2008 and August 31, 2014. The breakdown by event type and year is illustrated in Figure 13. Each hazard sub-section within this risk assessment provides more details about the NCDC-reported events.

Figure 13: Wells County NCDC-Reported Events (2008-2014)



5.1.3 Hazard-Ranking Methodology

During Meeting #1, held on September 30, 2014, the planning team reviewed historical hazards information and participated in a risk analysis exercise to rank hazards by community and severity of risk.

The team calculated the probability rating (Low, Medium, High) of each hazard, based on the number of events that have occurred in the county within the past six years. Throughout the planning process, the MHMP team had the opportunity to update the NCDC data with more accurate local information. For example, the NCDC records often list the locations of hazards, such as floods, under the county, not

accounting for how the individual communities were affected. In such situations, the probability rating assigned to the county was applied to all jurisdictions within the county.

Team consensus also was important in determining the probability of hazards not recorded by NCDC, for example, dam and levee failure, earthquakes, and hazardous materials spills. The probabilities for these hazardous events were determined by the planning team's estimation, derived from local experience and records, of the number of historical events that have occurred within the past 5 years.

After improving the NCDC data with additional local data, the team determined each hazard's potential impact on the communities. The impact rating (Minimal, Moderate, or Significant) was based on the following guidelines.

Table 14: Guidelines for Determining Probability and Impact

PROBABILITY		IMPACT	
Low	0-5 events in 10 years	Minimal	>Incident results in only minor injuries and no fatalities >Damage contained to a single incident scene and immediate area >Up to 5% of community facilities are damaged, destroyed, or inaccessible >Community able to effectively respond to incident with community resources and personnel >Complete shutdown of community facilities and loss of services for up to 3 days; community operations may be cancelled or relocated temporarily
Medium	6-10 events in 10 years	Moderate	>Incident results in a number of minor injuries, limited serious injuries, and few, if any, fatalities >Damage to critical infrastructure and property over a small area of community >Up to 25% of community facilities are damaged, destroyed, or inaccessible >Community is able to effectively respond to the incident with standard local mutual aid support >Complete shutdown of community facilities and loss of services for up to 1 week; some community operations must be cancelled or relocated temporarily
High	11+ events in 10 years	Significant	>Incident results in numerous serious injuries and multiple fatalities >Damage to critical infrastructure and property over a large area of community >Up to 50% of community facilities are damaged, destroyed, or inaccessible >Community has reached the limit of their response capabilities. Significant local mutual aid support required. >Complete shutdown of community facilities and loss of services for up to 2 weeks; community operations must be cancelled or relocated for an extended period of time.

The overall hazard risk was determined by multiplying probability and impact. It is important to consider both probability and impact when determining risk.

PROBABILITY X IMPACT = RISK

The planning teams plotted each hazard on a risk grid according to probability (y-axis) and potential impact (x-axis). The following figure describes the methodology of plotting hazards by risk. In this example, a tornado has a high probability of occurring in a given year with a significant potential impact, while an earthquake has a medium-high probability of occurring but a fairly minimal potential impact.

Figure 14: Risk Grid Methodology

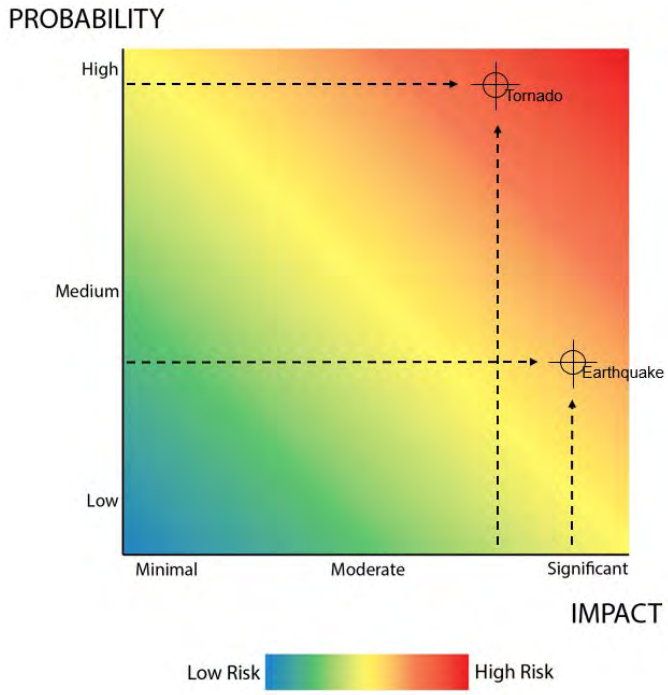
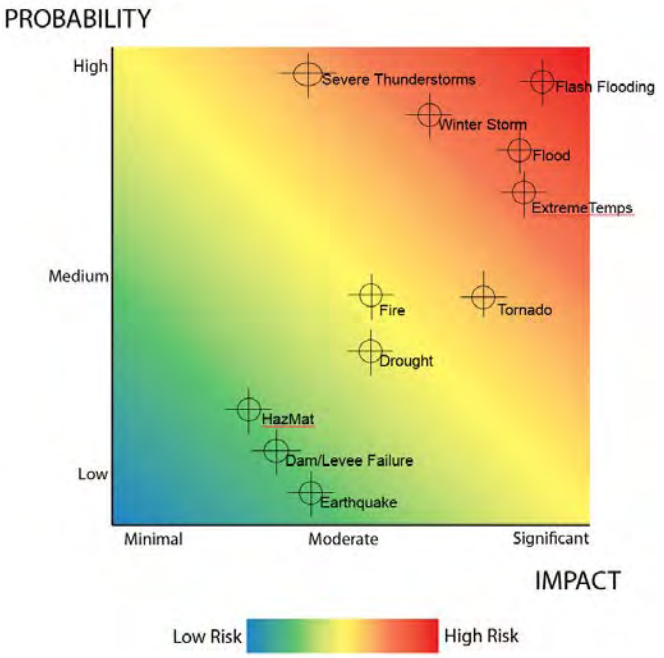


Figure 14 illustrates the risk grid methodology. In this example, a tornado has a high probability (y-axis) and a significant impact (x-axis), so overall, Indiana is at high risk for a tornado.

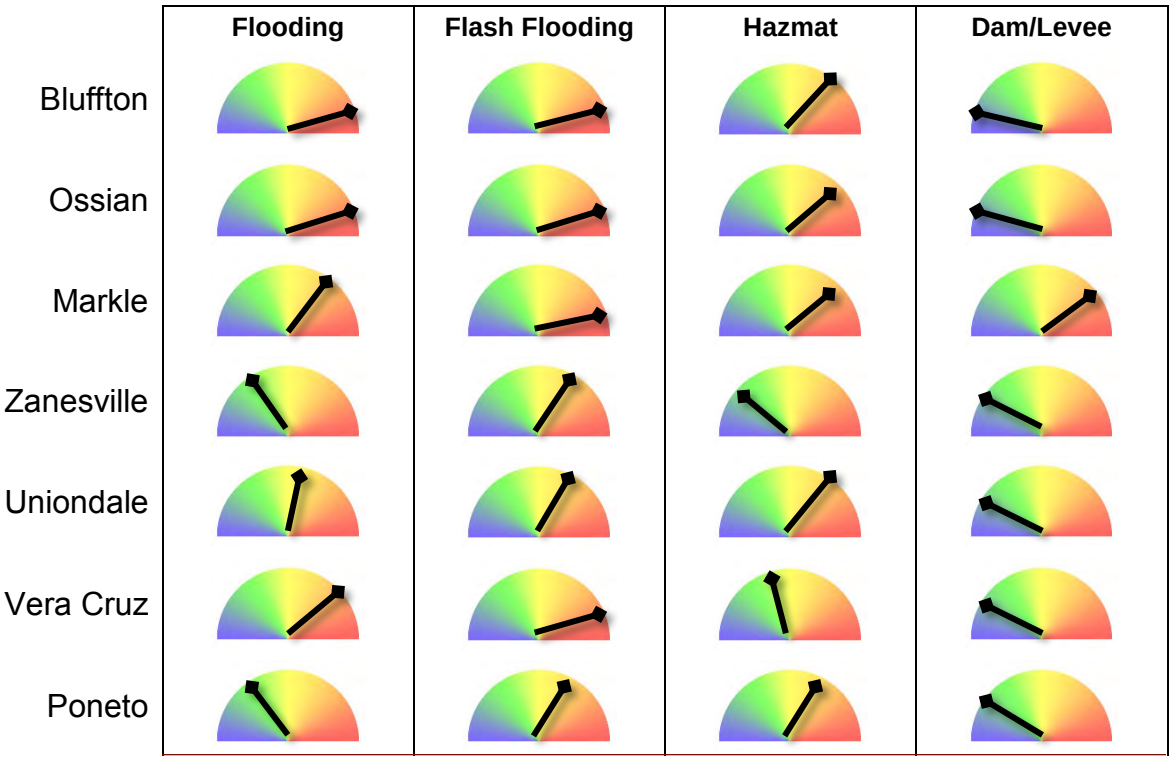
Wells County listed flash-flooding, flood and severe thunderstorm as the highest-risk disasters. Figure 15 illustrates the county's risk for each hazard.

Figure 15: Wells County Risk Matrix



While some hazards are widespread and will impact communities similarly, e.g. winter storms, others are localized leaving certain communities at greater risk than others. For example, a 2011 flash flood event in McNatts resulted in three to five inches of rain around the county line. The 2010 severe thunderstorm event in Poneto caused $100,000 damage to property. Another example of a severe thunderstorm which caused $10,000 worth property damage was in Tocsin. Trees and power lines were reported to be down in that area. The same example can be used for Hazardous materials spill. A chemical spill is more likely in Bluffton, Poneto and Ossian than in some of the other communities in the county due to the transportation routes that run through the town. The following figure illustrates each community's risk to flooding, dam/levee failure and hazardous material spill incidents.

Figure 16: Community Risk to Localized Events



At the request of the Indiana Department of Homeland Security, Wells County also completed the Calculated Priority Risk Index (CPRI) so that the State could more easily compare Wells County's risk to other counties and regions. The CPRI is available in Appendix D.

5.1.4 GIS and Hazus-MH Modeling

FEMA's Pre-Disaster Mitigation (PDM) program is designed to provide assistance to local communities to develop and implement their hazard mitigation plan, thereby reducing risk to property and lives. The initial multi-hazard mitigation plan (MHMP) for Wells County, Indiana was submitted to FEMA and approved in 2007.

Existing Hazus-MH technology was used in the development of the vulnerability assessment for flooding and earthquakes. With the implementation of new technology and locally available parcel datasets, more accurate results are now available. Multi-hazard mitigation plan updates may document significant variances from the original MHMP.

The flood and earthquake assessments are based on a Level 2 Hazus analysis. Hazus-MH generated a combination of site-specific (flood) and aggregated loss (earthquake) estimates. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across census blocks/tracts. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks/tracts. Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures considers the depth of water in relation to the structure. Hazus-MH also considers the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. Damages, however, are based upon the assumption that each structure will fall into a structural class, and structures in each class will respond in a similar fashion to a specific depth of flooding. Site-specific analysis is also based on a point location rather than a polygon; therefore the model does not account for the percentage of a building that is inundated.

It is important to note that Hazus-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood, earthquake, and hurricane-related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project. It is only intended to highlight the major steps that were followed during the project.

5.2 Assessing Vulnerability

The Indiana Department of Homeland Security, through IndianaMap, provided parcel boundaries to The Polis Center, and the Indiana Department of Local Government and Finance provided the County assessor records. Polis revised the Hazus-MH default data tables to reflect these updates prior to performing the risk assessment in order to improve the accuracy of the model predictions.

The default Hazus-MH data were updated as follows:

- The Hazus-MH defaults, critical facilities, and essential facilities were updated based on the most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts.
- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) were applied to the Hazus-MH model data. Hazus-MH reports of essential facility losses reflect updated data.

5.2.1 Identify Facilities

This plan includes two types of facilities: critical facilities and essential facilities.

CRITICAL FACILITIES are buildings that are deemed economically or socially viable to the county. Wells County has the following categories of critical facilities.

- **Transportation Systems** – 9 *airports* – necessary for transport of people and resources including airports, highways, railways, and waterways.
- **Lifeline Utility Systems** – *4 wastewater treatment plants, 1 potable water system, and 19 communications facilities* – vital to public health and safety.
- **High Potential Loss Facilities** – *3 dams* – failure or misoperation may have significant physical, social, and/or economic impact to neighboring community including nuclear power plants, high hazard dams, and military installations.
- **Hazardous Material Facilities** – *12 hazardous materials facilities* – involved in the production, storage, and/or transport of corrosives, explosives, flammable materials, radioactive materials, and toxins.

Wells County's critical facilities are listed and mapped in Appendix C.

ESSENTIAL FACILITIES are defined as those that are vital to the county in the event of a hazard. These include emergency operations centers, police departments, fire stations, schools, and care facilities. Essential facilities are a subset of critical facilities.

Table 15 identifies the essential facilities that were added or updated for the analysis. Wells County's essential facilities are listed and mapped in Appendix C.

Table 15: Essential Facilities of Wells County

Category	Number of Facilities
Care Facilities	13
Emergency Operations Centers	1
Fire Stations	8
Police Stations	3
Schools	14
Total	39

5.2.2 Facility Replacement Costs

Facility replacement costs and total building exposure, which reflect local data, are identified in Table 16 along with the estimated number of buildings within each occupancy class.

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

Table 16: Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure
Agricultural	1,550	$291,002,853
Commercial	451	$164,796,837
Education	15	$73,763,029
Government	68	$29,170,808
Industrial	79	$173,960,650
Religious/Non-Profit	131	$91,396,273
Residential	8,858	$1,273,809,283
Total	**11,152**	**$2,097,899,733**

5.3 Profiling Hazards

5.3.1 Flood Hazard

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

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

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

Recent Occurrences of Flooding

Since development of the last MHMP in 2007, there has only been one flood event, a flash flood in McNatts on July 24, 2011. However, the county has a history within the past 20 years of significant flooding. The NCDC database reported five flash flood events and one riverine flood event in Wells County since 2003. Most of the damage was caused by the riverine flood event in July 2003, which sustained $4,500,000 in property damage. Table 17 lists the NCDC flood reports since 2003.

Table 17: Wells County NCDC-Reported Flood Events (2003-2014)

Location	Date	Type	Death	Injury	Property Damage*	Crop Damage*
Bluffton	7/4/2003	Flash Flood	0	0	NR	NR
Uniondale	7/4/2003	Flash Flood	0	0	NR	NR
Bluffton	7/5/2003	Flash Flood	0	0	NR	NR
Wells County	7/5/2003	Flood	1	0	$4,500,000	NR
Bluffton	7/6/2003	Flash Flood	0	0	NR	NR
McNatts	7/24/2011	Flash Flood	0	0	NR	NR

**NR = None Reported*

Geographic Location for Flooding

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

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

In Wells County, Vera Cruz has the greatest overall risk for flooding with 60% of the community in the Special Flood Hazard Area. There are 10 structures in the 1%-annual-chance flood risk area (AKA 100-year floodplain) including seven residences.

The primary sources of river flooding in Wells County are the Wabash River, Eightmile Creek, Big Creek. Flat Creek, Sixmile Creek, Halls Creek, Rock Creek, Elm Creek, Scuffle Creek and Owl Creek. The Wabash

River runs through Bluffton and Vera Cruz and carries the potential of flooding over 25 buildings including over 13 residences, five commercial buildings and six government buildings.

Hazard Extent for Flooding

FEMA provided the Digital Flood Insurance Rate Map (DFIRM) that identifies studied streams. The Special Flood Hazard Area (SFHA), which represents the modeling of the 1%-annual-chance flood, was used in the analysis to identify specific stream reaches for analysis.

Flood hazard scenarios were modeled using GIS and Hazus-MH analyses. The October 2014 DFIRM maps were used to identify the areas of study. Planning team input and a review of historical information provided additional information on specific flood events.

Risk Identification for Flooding

Based on historical information, the probability of a flood is high, and the potential impact of a flood is significant; therefore the overall risk of a flood in Wells County is high.

Vulnerability Analysis

2007 Flood Analysis

For the 2007 MHMP, we completed a Hazus-MH analysis of the 100-year flood area. The analysis estimated that 136 buildings would be damaged with losses totaling $20 million. Better data collected for the 2015 plan update resulted in a more accurate estimation of damage, which is described in this section.

For the 2015 MHMP update, we used Hazus-MH to generate the flood depth grid for a 100-year return period and make calculations by clipping the IGS 1/3 ArcSecond DEM to the DFIRM boundary. Next, Hazus-MH utilized a user-defined analysis of Wells County with site-specific parcel data provided by the county through the Indiana Department of Homeland Security and downloaded from IndianaMap.

Hazus-MH estimates the 1%-annual-chance flood (AKA 100-year flood) would damage 26 buildings at a replacement cost of $597,998. Bluffton sustained the most damage with 11 buildings damaged at a replacement cost of $244,511. The total estimated numbers and cost of damaged buildings by community are given in Tables 18 and 19. Figure 19 depicts the Wells County parcel points that fall within the 1%-annual-chance flood risk area (AKA 100-year floodplain). Figures 18 through 23 highlight damaged buildings within the floodplain areas in each flood-prone jurisdiction.

Table 18: Number of Buildings Damaged by Community and Occupancy

Community	Total Buildings Damaged	Building Occupancy Class						
		Agriculture	Commercial	Education	Government	Industrial	Religious	Residential
Bluffton	11	1	5	0	3	0	0	2
Vera Cruz	5	0	0	0	0	0	0	5
Ossian	5	0	3	0	1	0	0	2
Markle	4	0	0	0	0	0	0	5
Zanesville	1	0	0	0	0	0	0	1
Total	**26**	**1**	**8**	**0**	**4**	**0**	**0**	**15**

Table 19: Cost of Buildings Damaged by Community and Occupancy

Community	Total Losses ($)	Building Occupancy Class						
		Agriculture	Commercial	Education	Government	Industrial	Religious	Residential
Bluffton	244,511	0	193,070	0	41,441	0	0	10,000
Vera Cruz	68,278	0	0	0	0	0	0	68,278
Ossian	105,661	0	23,680	0	41,016	0	0	40,965
Markle	91,843	0	0	0	0	0	0	91,843
Zanesville	87,705	0	0	0	0	0	0	87,705
Total	**597,998**	**0**	**216,750**	**0**	**82,457**	**0**	**0**	**298,791**

Figure 17: Total Buildings in Floodplain (1% Annual Chance)

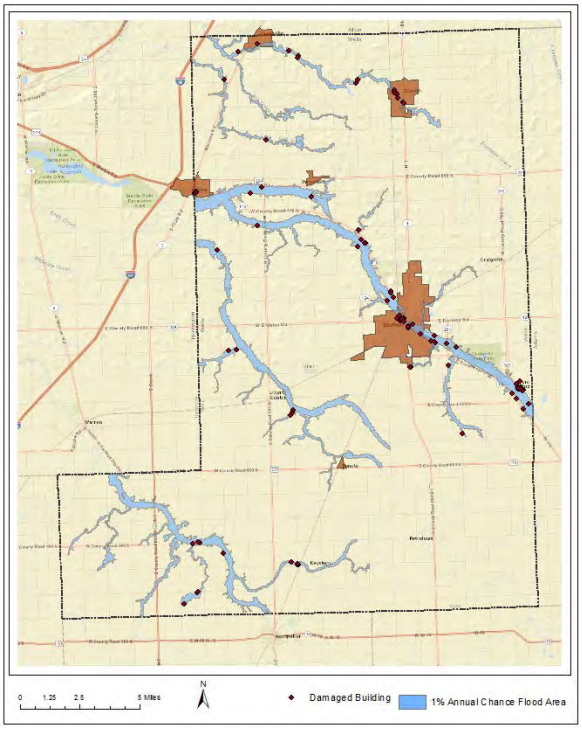


Figure 18: Wells County Unincorporated Flood Prone Areas (1% Annual Chance)

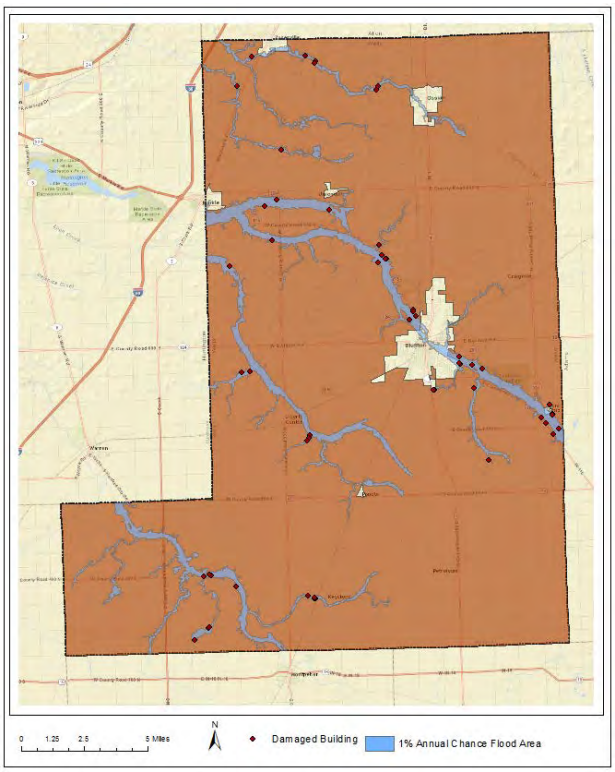


Figure 19: Bluffton Flood-Prone Areas (1% Annual Chance)

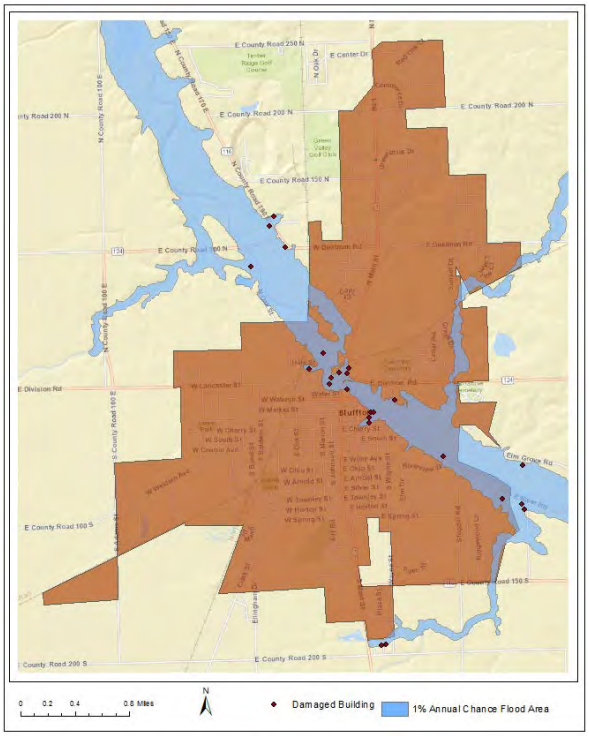


Figure 20: Vera Cruz Flood-Prone Areas (1% Annual Chance)

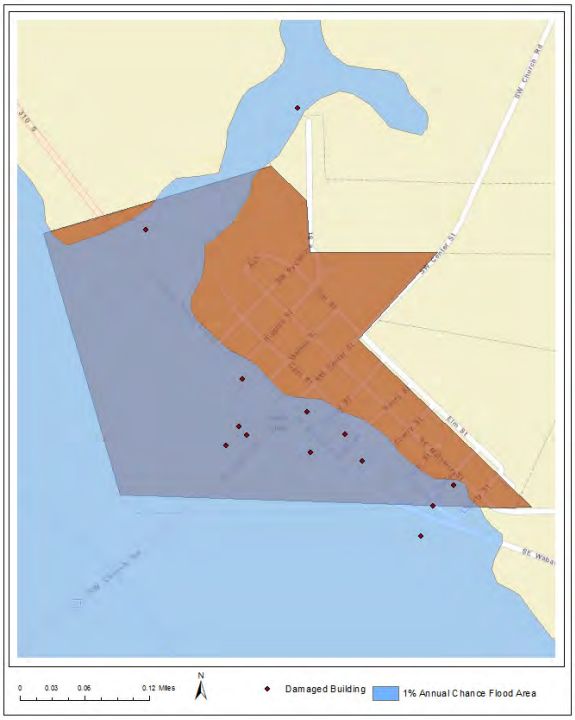


Figure 21: Ossian Flood-Prone Areas (1% Annual Chance)

Figure 22: Markle Flood-Prone Areas (1% Annual Chance)

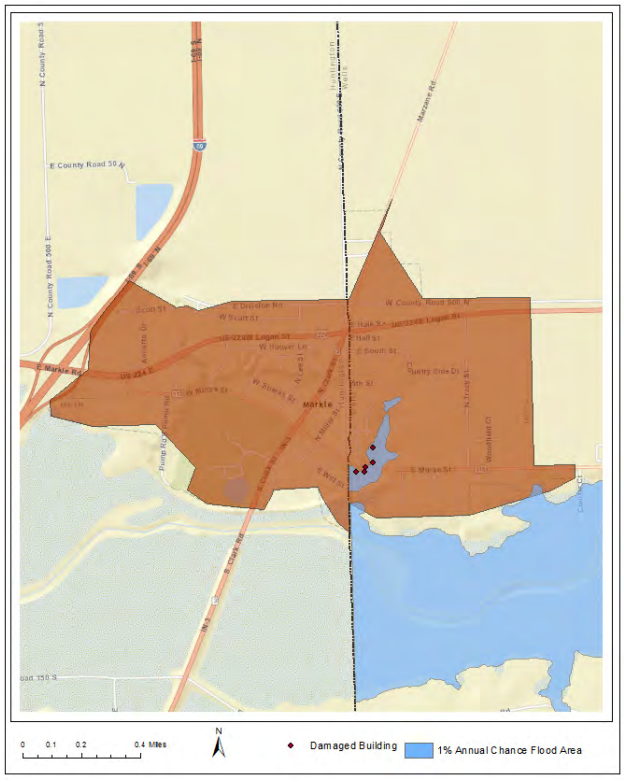
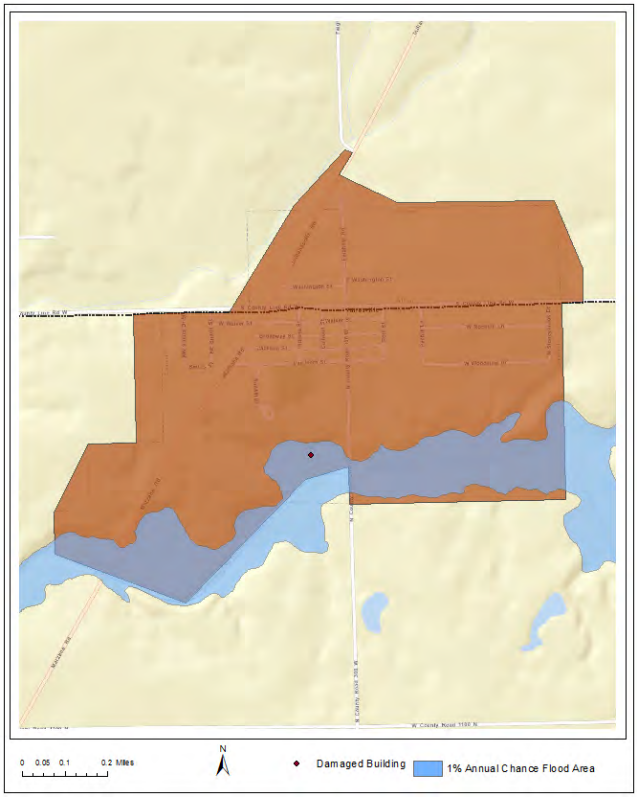


Figure 23: Zanesville Flood-Prone Areas (1% Annual Chance)



Hazus-MH Overlay Analysis of Essential Facilities

An essential facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged fire station will no longer be able to serve the community).

The results of the overlay analysis indicate that there are no essential facilities in Wells County within the 100-year floodplain.

Hazus-MH Overlay Analysis of Critical Facilities

A critical facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged waste water facility will no longer be able to serve the community).

The results of the overlay analysis, shown in Figures 24 through 26, indicate that seven critical facilities and 102 highway bridges in Wells County could sustain damage: one dam; one hazardous material site; three communication facilities; two wastewater facilities (Ossian and Uniondale).

Figure 24: Boundary of 1% Annual Chance Flood Overlaid with Ossian Critical Facilities

Figure 25: Boundary of 1% Annual Chance Flood Overlaid with Bluffton Critical Facilities

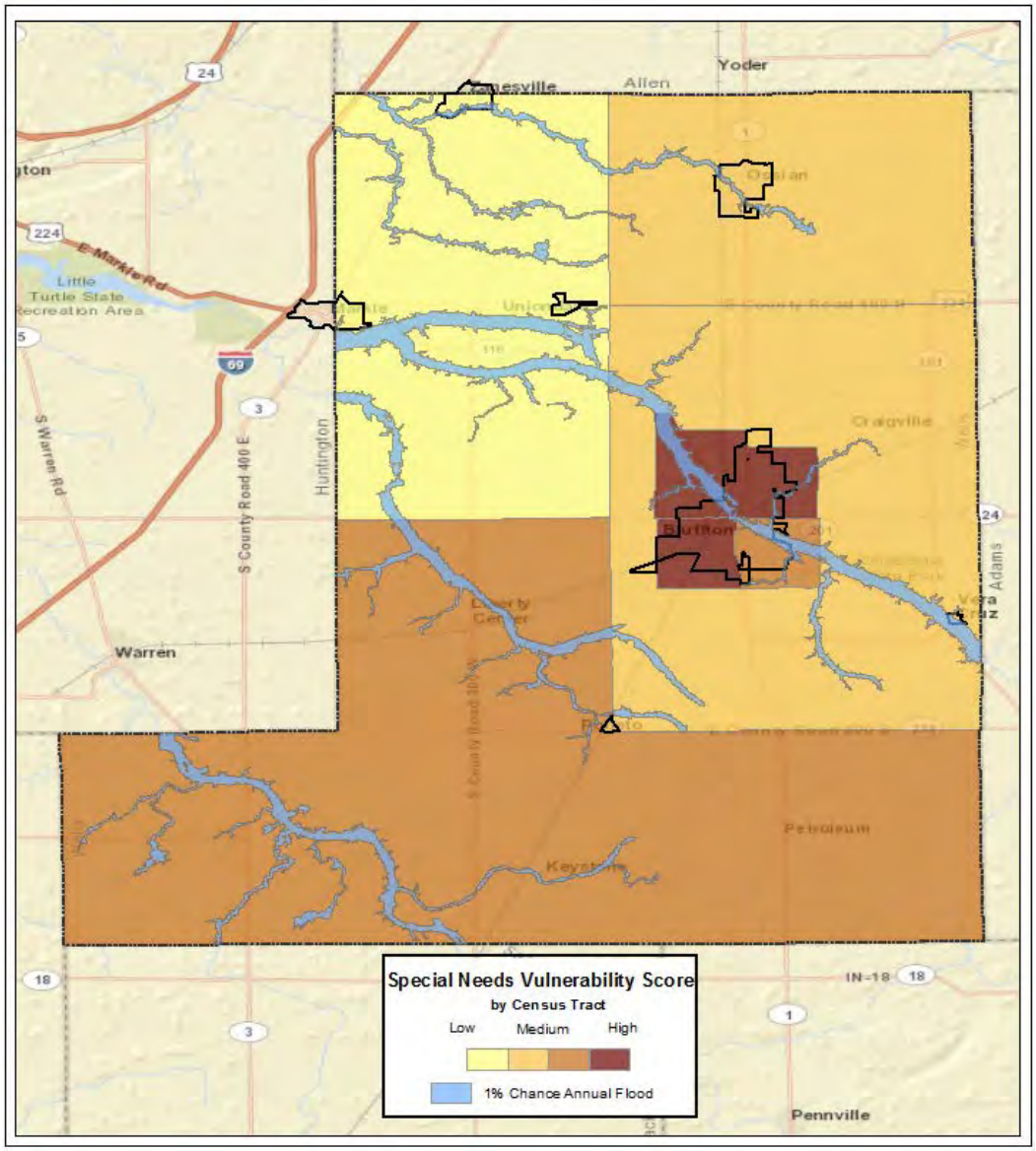
A

Figure 26: Boundary of 1% Annual Chance Flood Overlaid with Wells County Unincorporated Critical Facilities

Flood Damages to Vulnerable Populations

Vulnerable populations require special attention during a natural disaster. In Wells County, Bluffton and Vera Cruz communities have higher number of flood prone buildings. Bluffton in particular is located in an area with a high Special Needs Vulnerability Score. The census tracts within Bluffton have a relatively higher vulnerability score compared to the rest of the county. The census tract including Bluffton has the highest percentage (18.4%) of its residents living in poverty and a significant population (12.4%) living with a disability. Bluffton also has highest percentage of its residents (29%) who are above sixty-five years of age. Also, there is a mobile home park in Zanesville, located in a flood prone area, housing a high proportion of special needs residents. Figure 27 illustrates the Special Needs Vulnerability Score by census tract with the 100-year flood boundary overlaid.

Figure 27: Flooding in Areas with Special Needs Populations



NFIP Analysis

FEMA provides annual funding through the National Flood Insurance Fund (NFIF) to reduce the risk of flood damage to existing buildings and infrastructure. These grants include Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), and the Severe Repetitive Loss (SRC) program and have been rolled into the Flood Mitigation (FMA) Grant Program. The long-term goal is to significantly reduce or eliminate claims under the NFIP through mitigation activities.

Every community in Wells County participates in the NFIP. Table 20 lists the participation dates as of December 2014.

Table 20: NFIP Participation Status

Community	Pre-FIRM Date (Init FIRM Identified)	Current Effective Map Date	Participation Date (Reg-Emer Date)
Wells County (Unincorporated)	06/01/1983	10/16/2014	06/01/1983
Bluffton	07/18/1983	10/16/2014	07/18/1983
Markle	10/16/2014	10/16/2014	11/07/1991
Ossian	10/16/2014	10/16/2014	05/25/1978
Poneto	10/16/2014	NSFHA*	05/25/1978
Uniondale	10/16/2014	NSFHA*	05/25/1978
Vera Cruz	04/01/1988	10/16/2014	04/01/1988

**Non-Special Flood Hazard Area (NSFHA): in a moderate-to-low risk flood zone*

At this time, not all incorporated areas of Well County participate in the NFIP'S Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions, meeting the three goals of the CRS: 1) reduce flood losses; 2) facilitate accurate insurance rating; and 3) promote the awareness of flood insurance. As of May 1, the following are effective CRS communities 2015: Wells County (CRS Class 8), Bluffton (CRS Class 7), Ossian (CRS Class 8), and Vera Cruz (CRS Class 7).

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

The Indiana State NFIP Coordinator and FEMA Region V were contacted to determine the location of repetitive loss structures. Wells County has one unmitigated repetitive loss property (a residential structure) in Bluffton that is considered. Table 21 on the following page documents the Wells County NFIP claims data (including repetitive losses) as of December 31, 2013.

Table 21: NFIP Claims Data

Community	% of Community in SFHA	Number of Policies	Value of Insurance Claims/Pmts	Number of Insurance Claims/ Losses	Repetitive Losses in Dollars	Number of Repetitive Losses
Wells County (Unincorporated)	6.04%	14	$103,857	7	$0	0
Vera Cruz	60.34%	3	$0	6	$0	0
Zanesville	19.08%	0	$0	0	$0	0
Ossian	9.49%	0	$0	0	$0	0
Bluffton	8.63%	13	$261,861	15	$31,054	1
Poneto	0.00%	0	$0	0	$0	0
Uniondale	0.00%	0	$0	0	$0	0

Table 22 provides a comparison of number of buildings in the 100-year-flood probability boundary to the number of policies, and then provides a percent of insured structures represented by those policies. The last column in the table provides an estimate of the exposure that is insured.

Table 22: Comparison of Building Exposure to Insured Buildings

Community	Buildings in 100 Year Floodplain[1]	Exposure of Buildings in Floodplain	Number of Policies	Insured Value of Policies	Approximate Percent of Buildings Insured	Percent of Exposure Insured
Wells County	103	$15,244,953	14	$4,709,700	13.59%	30.89%
Vera Cruz	18	$3,255,478	3	$262,400	16.67%	8.06%
Zanesville	2	$372,161	0	$0	0.00%	0.00%
Ossian	10	$1,184,708	0	$0	0.00%	0.00%
Bluffton	18	$3,255,478	13	$2,316,200	72.22%	71.15%
Poneto	0	$0	0	$0	0.00%	0.00%
Uniondale	0	$0	0	$0	0.00%	0.00%

CONSIDER THIS

In unincorporated Wells County, only **13.6%** of the buildings within the 100-year floodplain are insured. The insurance covers only **30.9%** of the total value of those buildings.

Of Wells County communities, Bluffton has the best ratio of insured buildings to building exposure. **72.2%** of its buildings within the 100-year floodplain are insured, and insurance covers **71.2%** of the total value of those buildings.

[1] The count and exposure of buildings in the floodplain reported in this table is based on an account of all structures in the floodplain that were represented in the county property assessment data.

Buyouts

Wells County has a total of 32 buyouts, 18 of which are within Bluffton and 11 within Vera Cruz. These recent buyouts have significantly minimized the repetitive loss dollars for Wells County. Figures 28, 29 and 30 map the buyouts in Wells County, Bluffton and Vera Cruz respectively.

Figure 28: Buyouts in Wells County

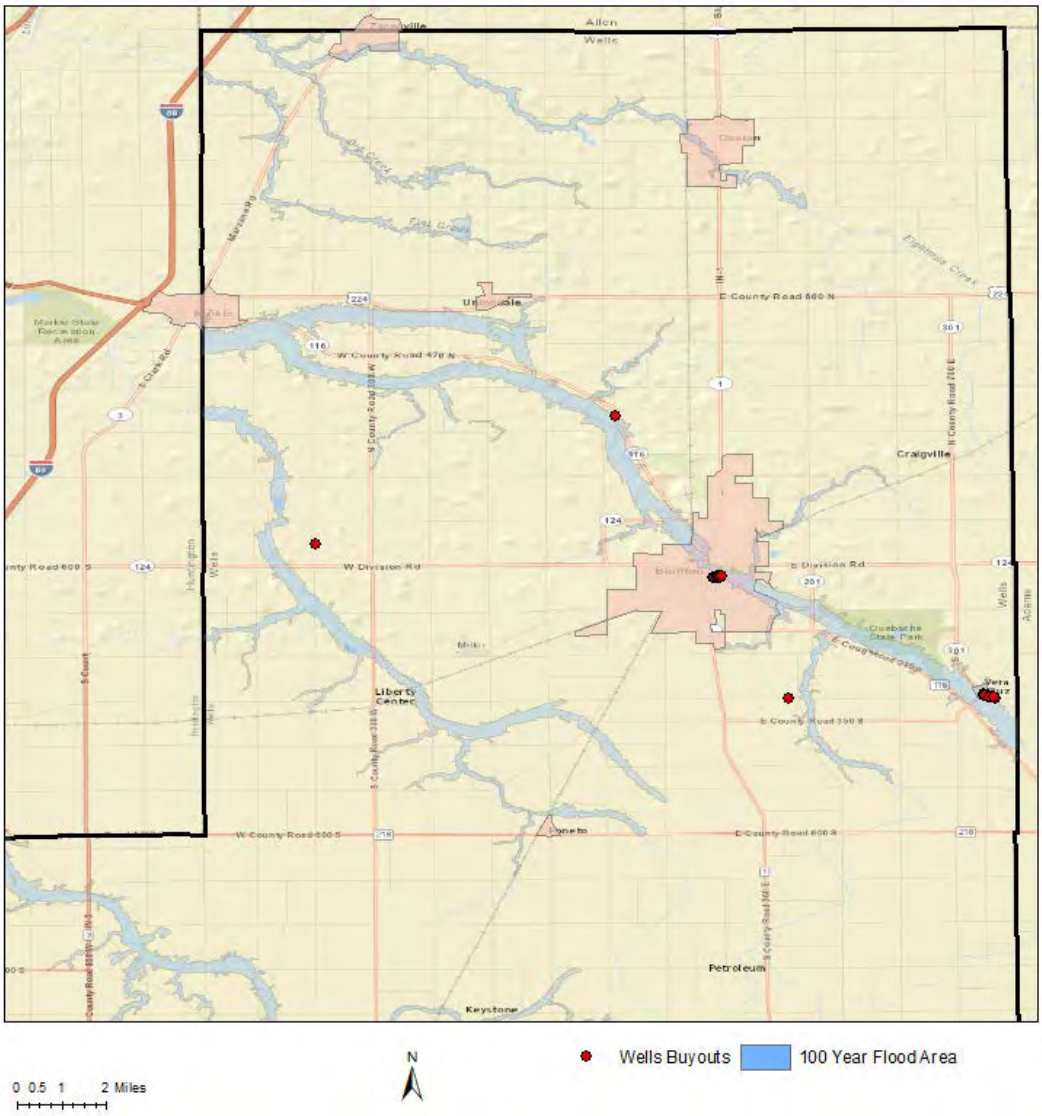


Figure 29: Buyouts in Bluffton Community

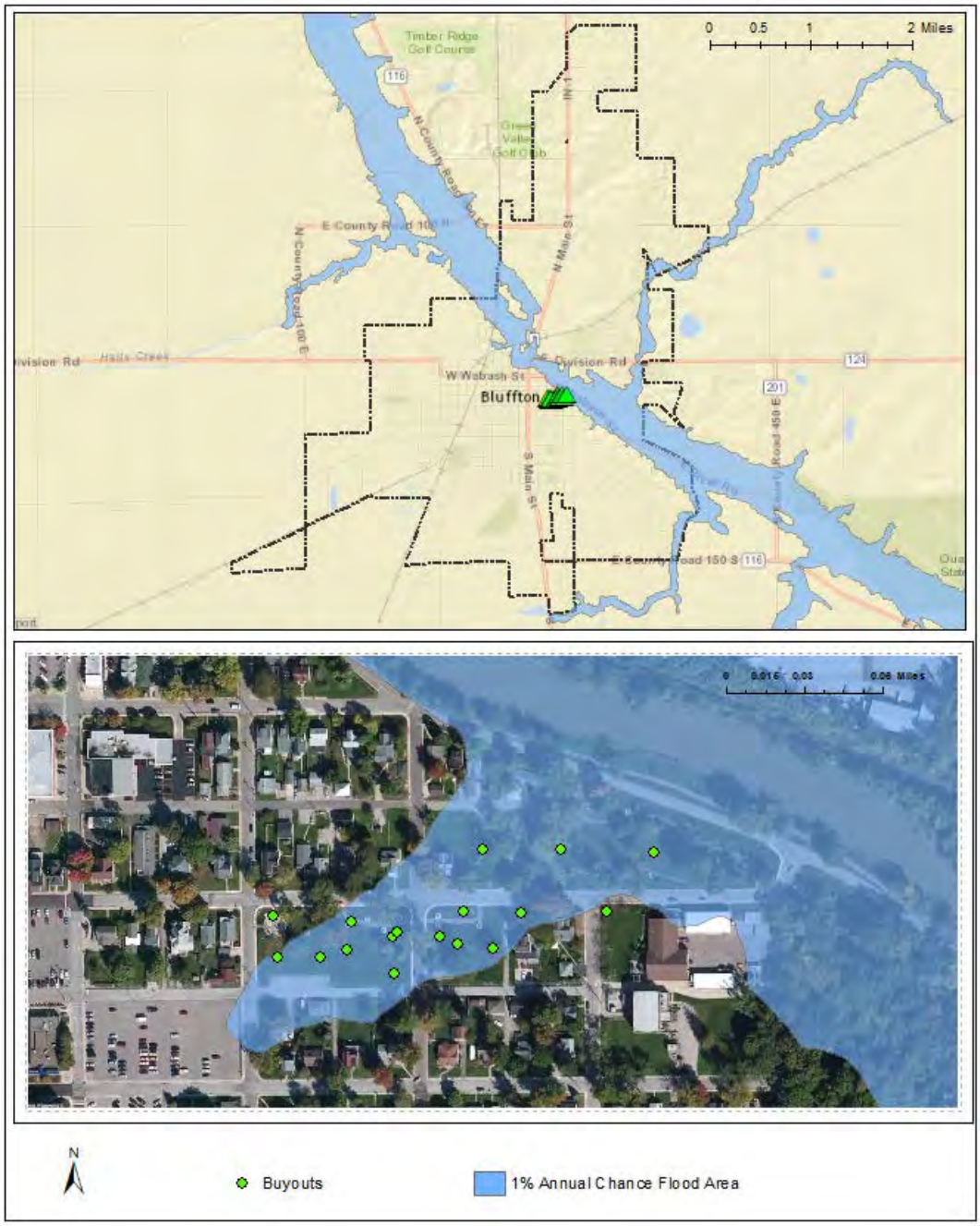


Figure 30: Buyouts in Vera Cruz Community

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Flooding

The Wells County Comprehensive Emergency Management Plan outlines various mitigation strategies concerning future development in Wells County. These strategies include establishment of ordinances and policies which take into account areas which have the potential for flooding and annual repair work on the county's dams and levees.

5.3.2 Severe Thunderstorm Hazard

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

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

Hail

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

Lightning

Lightning is a discharge of atmospheric electricity from a thunderstorm. It can travel at speed up to 140,000 mph and reach temperatures approaching 54,000 degrees. Lightning often is perceived as a minor hazard; in reality, lightning causes damage to many structures and kills, or severely injures, numerous people in the United States. It is estimated that there are 16 million lightning storms worldwide every year.

Severe Winds (Straight-Line Winds)

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

Recent Occurrences of Thunderstorms

The NCDC database reported 53 thunderstorm events since 2007, as shown in Table 23 on the following page. One of the most significant storm events occurred on June 9, 2008 causing $250,000 worth property damage when a lightning bolt hit Bluffton. Another thunderstorm event which caused significant property damage was in Poneto which occurred on October 26, 2010. There have been several other key storm events in the past five years that have been described in the NCDC data and in local news media reports.

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

Table 23: Wells County Thunderstorm Events Reported to NCDC (2008-2014)

Location	Date	Type	Magnitude	Injuries	Deaths	Property Damage $*	Crop Damage $*
Ossian	6/8/2007	High Winds	50 kts.	0	0	NR	NR
Ossian	6/27/2007	High Winds	55 kts.	0	0	$25,000	NR
Bluffton	8/16/2007	High Winds	55 kts.	0	0	$25,000	NR
Ossian	8/24/2007	High Winds	55 kts.	0	0	NR	NR
Mc Natts	8/24/2007	High Winds	55 kts.	0	0	$10,000	NR
Liberty Center	6/6/2008	High Winds	60 kts.	0	0	NR	NR
Bluffton	6/6/2008	High Winds	60 kts.	0	0	NR	NR
Uniondale	6/6/2008	High Winds	56 kts.	0	0	NR	NR
Craigville	6/6/2008	High Winds	65 kts.	0	0	NR	NR
Bluffton	6/9/2008	Lightning		0	0	$250,000	NR
Bluffton	6/25/2008	High Winds	60 kts.	0	0	NR	NR
Craigville	6/25/2008	High Winds	55 kts.	0	0	NR	NR
Tocsin	7/8/2008	High Winds	50 kts.	0	0	$10,000	NR
Wells (Zone)	2/11/2009	High Wind	50 kts.	0	0	NR	NR
Liberty Center	6/25/2009	High Winds	50 kts.	0	0	NR	NR
Wells (Zone)	12/9/2009	High Wind	50 kts.	0	0	NR	NR
Bluffton	5/5/2010	Hail	1.00 in.	0	0	NR	NR
Bluffton	5/5/2010	High Winds	50 kts.	0	0	NR	NR
Bluffton	6/18/2010	High Winds	55 kts.	0	0	NR	NR
Bluffton	6/18/2010	High Winds	55 kts.	0	0	$5,000	NR
Bluffton	6/23/2010	High Winds	55 kts.	0	0	NR	NR
Bluffton	6/23/2010	High Winds	55 kts.	0	0	NR	NR
Poneto	10/26/2010	High Winds	65 kts.	0	0	$100,000	NR
Vera Cruz	10/26/2010	High Winds	65 kts.	0	0	NR	NR
Bluffton	10/26/2010	High Winds	60 kts.	0	0	NR	NR
Bluffton	10/26/2010	High Winds	60 kts.	0	0	NR	NR
Kingsland	4/19/2011	High Winds	65 kts.	0	0	NR	NR
Uniondale	5/23/2011	Hail	1.00 in.	0	0	NR	NR
Bluffton	5/25/2011	Hail	0.75 in.	0	0	NR	NR
Liberty Center	5/25/2011	High Winds	54 kts.	0	0	NR	NR
Liberty Center	6/4/2011	Hail	1.00 in.	0	0	NR	NR
Ossian	8/7/2011	High Winds	58 kts.	0	0	NR	NR
Kingsland	8/7/2011	High Winds	58 kts.	0	0	NR	NR
Keystone	11/14/2011	Hail	0.75 in.	0	0	NR	NR
Liberty Center	4/30/2012	Hail	1.00 in.	0	0	NR	NR
Bluffton	4/30/2012	Hail	0.88 in.	0	0	NR	NR
Bluffton	4/30/2012	Hail	1.00 in.	0	0	NR	NR
Liberty Center	6/29/2012	High Winds	55 kts.	0	0	NR	NR
Bluffton	6/29/2012	High Winds	50 kts.	0	0	NR	NR
Bluffton	7/1/2012	Hail	0.75 in.	0	0	NR	NR
Bluffton	7/1/2012	Hail	0.75 in.	0	0	NR	NR
Bluffton	7/1/2012	Hail	1.00 in.	0	0	NR	NR
Rockford	8/4/2012	High Winds	55 kts.	0	0	NR	NR
Liberty Center	9/7/2012	High Winds	50 kts.	0	0	NR	NR
Bluffton	6/12/2013	High Winds	55 kts.	0	0	NR	NR
Uniondale	11/17/2013	High Winds	56 kts.	0	0	NR	NR
Bluffton	11/17/2013	High Winds	51 kts.	0	0	NR	NR
Vera Cruz	11/17/2013	High Winds	55 kts.	0	0	NR	NR
Wells Co.	7/1/2014	High Winds	60 kts.	0	0	NR	NR
Wells Co.	7/26/2014	Hail	1.50 in.	0	0	NR	NR

Location	Date	Type	Magnitude	Injuries	Deaths	Property Damage $*	Crop Damage $*
Wells Co.	7/26/2014	Hail	1.25 in.	0	0	NR	NR
Wells Co.	7/26/2014	Hail	2.00 in.	0	0	NR	NR
Wells Co.	7/26/2014	Hail	1.75 in.	0	0	NR	NR

**NR=None Reported*

Geographic Location for Thunderstorm Hazard

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

Hazard Extent for Thunderstorm Hazard

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

Risk Identification for Thunderstorm Hazard

Based on historical information, the probability of severe thunderstorm is high, and the potential impact is moderate-significant; therefore the overall risk of a severe thunderstorm in Wells County is high.

Vulnerability Analysis for Thunderstorm Hazard

Severe thunderstorms are an equally distributed threat across the entire jurisdiction; therefore the entire county's population and all buildings are vulnerable to a severe thunderstorm, and the same impacts can be expected within the affected area. This plan will therefore consider all buildings within the county as vulnerable.

Facilities

All facilities are vulnerable to severe thunderstorms. An essential or critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a damaged police station will no longer be able to serve the community). Names and locations of critical and essential facilities are in Appendix C.

Building Inventory

Impacts similar to those discussed for critical facilities can be expected for the buildings within the county. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a damaged home will no longer be habitable, causing residents to seek shelter).

Infrastructure

During a severe thunderstorm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Because the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these structures could become damaged during a severe thunderstorm. The impacts to these structures include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could fail or become impassable, causing risk to traffic. Additionally, aerial navigations aids in Wells County, including components of the national air traffic control system, could be damaged or destroyed possibly impacting nationwide air travel.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

Due to the unpredictability of this hazard, all new buildings and infrastructure in Wells County are at risk of damage including temporary or permanent loss of function. For hailstorms, thunderstorms, and windstorms, it is not possible to isolate specific essential or non-essential facilities that would be more or less vulnerable to damages. However, based on the information obtained from the assessment in the 2007 plan regarding previous events of this nature, future storms are likely to cause monetary damages to structures. NCDC data for the past ten years reports property damage in excess of $1.3 million, or an average of $130,000 property damage per year. It should also be noted that property owners often do not report damages caused by the events recorded by the NCDC. Therefore, damages to property should be expected to be significantly higher than the stated range.

5.3.3 Extreme Temperatures

Extreme temperatures—both hot and cold—can have significant impact on human health and safety, commercial businesses, agricultures, and primary and secondary effects on infrastructure (e.g. burst pipes, power failures, etc.) Weather conditions described as extreme heat or cold vary across different areas of the country, based on the range of average temperatures within the region.

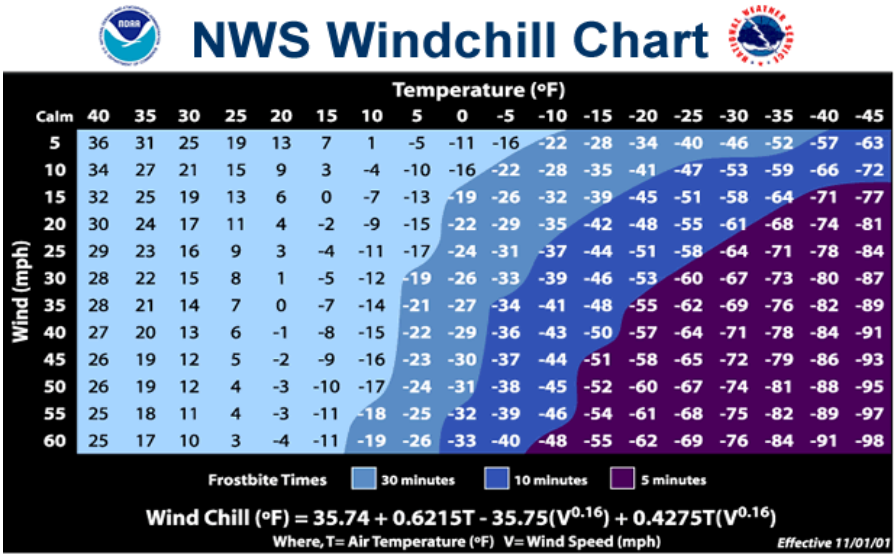
Severe Cold Hazard Definition

What constitutes an extreme cold event, and its effects, varies by region across the United States. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Extreme cold temperatures are typically characterized by the ambient air temperature dropping to approximately zero degrees Fahrenheit or below.

The magnitude of extreme cold temperatures is generally measured through the Wind Chill Temperature (WCT) Index. Wind Chill Temperature is the temperature that is felt when outside and is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin's temperature to drop.

In 2001, the National Weather Service implemented a new WCT Index, designed to more accurately calculate how cold air feels on human skin. The index, shown in Figure 31, includes a frostbite indicator, showing points where temperature, wind speed, and exposure time will produce frostbite in humans.

Figure 31: NWS Wind Chill Temperature Index



Each National Weather Service Forecast Office may issue the following wind chill-related products as conditions warrant:

- **Wind Chill Watch**: Issued when there is a chance that wind chill temperatures will decrease to at least 24° F below zero in the next 24-48 hours.
- **Wind Chill Advisory**: Issued when the wind chill could be life threatening if action is not taken. The criteria for this advisory are expected wind chill readings of 15° F to 24° F below zero.
- **Wind Chill Warning**: Issued when wind chill readings are life threatening. Wind chill readings of 25° F below zero or lower are expected.

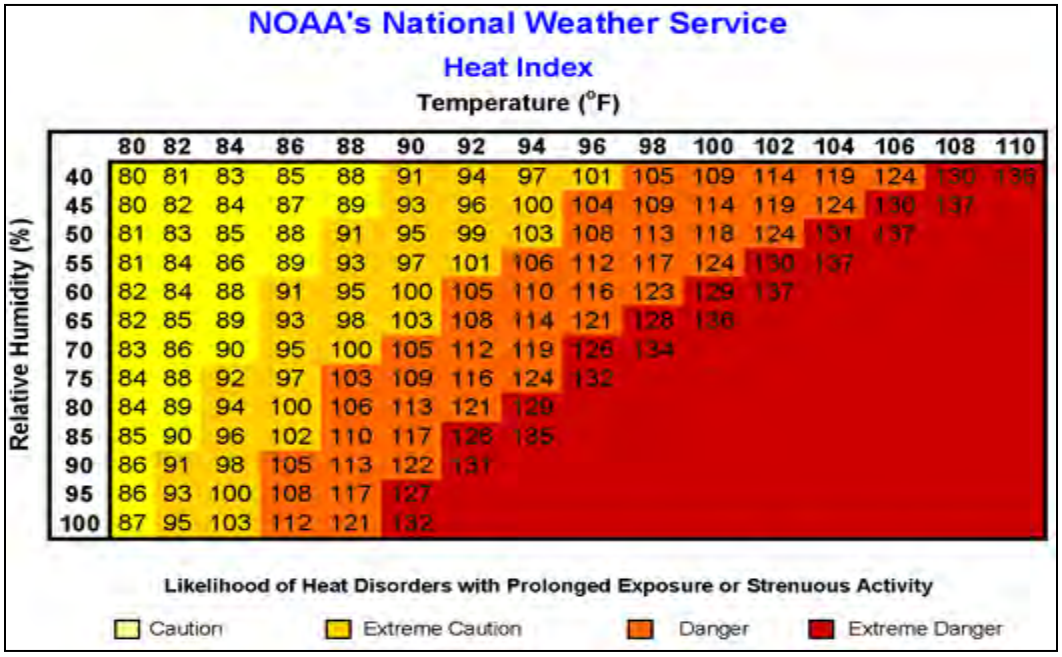
Extreme Heat Hazard Definition

Temperatures that hover 10 degrees Fahrenheit or more above the average high temperature for a region, and last for several weeks, constitute an extreme heat event (EHE). An extended period of extreme heat of three or more consecutive days is typically referred to as a heat wave. Most summers see EHEs in one or more parts of the U.S. East of the Rocky Mountains, they tend to combine both high temperatures and high humidity; although some of the worst heat waves have been catastrophically dry.

Criteria for EHE typically shift by location and time of year, and are dependent on the interaction of multiple meteorological variables (i.e. temperature, humidity, cloud cover.) Heat alert procedures are based primarily on Heat Index Values. The Heat Index—given in degrees Fahrenheit—is often referred to as the apparent temperature and is a measure of how hot it really feels when the relative humidity is

factored with the actual air temperature. The National Weather Service Heat Index Chart can be seen in Figure 32.

Figure 32: National Weather Service Heat Index[18]



Each National Weather Service Forecast Office may issue the following heat-related products as conditions warrant:

- **Excessive Heat Outlooks**- issued when the potential exists for an EHE in the next 3-7 days. An outlook provides information to those who need considerable lead time to prepare for the event, such as public utility staff, emergency managers, and public health officials.

- **Excessive Heat Watches**- issued when conditions are favorable for an EHE in the next 24 to 72 hours. A watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain. It provides enough lead time so that those who need to prepare can do so, such as city officials who have excessive heat mitigation plans.

- **Excessive Heat Warnings/Advisories**- issued when an EHE is expected in the next 36 hours. These products are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life or property. An advisory is for less serious conditions that cause significant discomfort or inconvenience and, if caution is not taken, could lead to a threat to life and/or property.

[18] Office of Atmospheric Programs. (2006). Excessive Heat Events Guidebook. Unites States Environmental Protection Agency. Washington, D.C.

Extreme Heat can impact transportation facilities. Roads, specifically concrete constructed roads, can explode due to expansion during extreme temperatures. Railroad rails can bow or flex out due to expansion during extreme temperatures causing major railway failures.

Previous Occurrences for Extreme Temperatures

The only NCDC-recorded occurrence of extreme temperatures between 2008 and 2014 was an extreme cold/wind chill event on January 6, 2014. An arctic airmass took residence over the region behind a strong winter storm January 6th and 7th. West winds between 20 and 30 mph, occasionally gusting to 40 mph, created dangerous wind chill values between 30 and 45 degrees below zero. These strong winds also created significant blowing and drifting snow with roads impassable at times.

Geographic Location for Extreme Temperatures

Extreme temperature events are regional in nature. All areas of the state are vulnerable to the risk of extreme cold and heat.

Hazard Extent for Extreme Temperatures

Extreme cold events typically occur in the winter months. The extent of extreme cold varies in terms of the Wind Chill Temperature and duration of the event.

Excessive heat events typically occur in the summer months. The extent of excessive heat events varies in terms of the Heat Index and duration of the event. The duration will vary although it could span up to several months.

Risk Identification for Extreme Temperatures

The planning team determined that the probability of an extreme temperature hazard is moderately high in Wells County, and the impact of such an event is significant, resulting in a risk of moderate-high.

Vulnerability Analysis for Extreme Temperatures

Extreme temperatures affect mostly humans, particularly special needs populations, and animals. These events may be exacerbated by power loss. For this planning effort, it was not possible to analyze the number of lives or amount of property exposed to the impacts of extreme heat.

Vulnerability to Extreme Cold

Extreme cold can result in damages to buildings, utilities, and infrastructure, due to the strong winds that often accompany these events. Additionally, extreme cold events often lead to severe short and long term health conditions, or even death. Extreme cold events can occur within any area in the county; therefore, the entire county population and all buildings are vulnerable to extreme cold hazards.

Exposure to cold temperatures—indoors or outdoors—can lead to serious or life-threatening health problems, including hypothermia, cold stress, frostbite or freezing of the exposed extremities, such as fingers, toes, nose, and earlobes. Certain populations—such as seniors, infants and young children under five years of age, individuals who are homeless or stranded, or those who live in a home that is poorly insulated or without heat (such as mobile homes)—are at greater risk to the effects of extreme cold.

Extremely cold temperatures often accompany a winter storm, so individuals may also have to cope with power failures and icy roads. Although staying indoors can help reduce the risk of vehicle accidents and falls on the ice, individuals are susceptible to indoor hazards. Homes may become too cold due to power failures or inadequate heating systems. The use of space heaters and fireplaces to keep warm increases the risk of household fires, as well as carbon monoxide poisoning.

Vulnerability to Excessive Heat

Prolonged exposure to extreme heat may lead to serious health problems, including heat stroke, heat exhaustion, or sunburn. Certain populations—such as seniors, infants and young children under five years of age, pregnant women, the homeless or poor, the overweight, and people with mental illnesses, disabilities, and chronic diseases—are at greater risk to the effects of extreme heat. Depending on severity, duration, and location, EHEs can also trigger secondary hazards, including dust storms, droughts, wildfires, water shortages, and power outages.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Extreme Temperatures

While extreme cold can result in damages to buildings, utilities, and infrastructure—due to the strong winds that often accompany these events—extreme heat leaves little to no physical damage to communities. They can, however, lead to severe short and long-term health conditions, or even death. Extreme temperatures can also impact environmental and economic vulnerabilities as a result of water shortages and drought.

5.3.4 Winter Storm Hazard

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

Ice (Glazing) and Sleet Storms

Ice or sleet, even in the smallest quantities, can result in hazardous driving conditions and can be a significant cause of property damage. Sleet can be easily identified as frozen raindrops. Sleet does not stick to trees and wires. The most damaging winter storms in Indiana have been ice storms. Ice storms are the result of cold rain that freezes on contact with objects having a temperature below freezing. Ice

storms occur when moisture-laden gulf air converges with the northern jet stream, causing strong winds and heavy precipitation. This precipitation takes the form of freezing rain, coating power lines, communication lines, and trees with heavy ice. The winds then will cause the overburdened limbs and cables to snap, leaving large sectors of the population without power, heat, or communication. Falling trees and limbs also can cause building damage during an ice storm. In the past few decades, numerous ice-storm events have occurred in Indiana.

Snowstorms

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

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

Recent Occurrences of Winter Storms

Winter weather hazards are prevalent natural events that can be expected to occur every winter in Indiana. The winter of 2013-2014 ranked among the coldest on record throughout the Midwest. The National Weather Service reported this season as “one of the coldest and snowiest winter seasons on record and certainly one of the most extreme winter seasons in several decades.” The NCDC stated that the period from December 2013 through February 2014 was the 34th coldest for the contiguous 48 states since 1895. Table 24 lists the winter storm events reported to NCDC between 2008 and early 2014.

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

Table 24: Wells County Winter Storm Events Reported to NCDC (2008-2014)

Date	Location	Type	Death	Injury	Property Damage $*	Crop Damage $*
2/1/2008	Wells (Zone)	Winter Storm	0	0	NR	NR
2/25/2008	Wells (Zone)	Winter Storm	0	0	NR	NR
3/4/2008	Wells (Zone)	Winter Storm	0	0	NR	NR
12/18/2008	Wells (Zone)	Ice Storm	0	0	NR	NR
1/27/2009	Wells (Zone)	Heavy Snow	0	0	NR	NR
1/7/2010	Wells (Zone)	Winter Weather	0	0	NR	NR
2/5/2010	Wells (Zone)	Winter Storm	0	0	NR	NR
2/9/2010	Wells (Zone)	Winter Weather	0	0	NR	NR
12/12/2010	Wells (Zone)	Winter Storm	0	0	NR	NR
1/11/2011	Wells (Zone)	Winter Weather	0	0	NR	NR
2/1/2011	Wells (Zone)	Winter Storm	0	0	NR	NR
2/5/2011	Wells (Zone)	Winter Weather	0	0	NR	NR
2/25/2011	Wells (Zone)	Heavy Snow	0	0	NR	NR
1/12/2012	Wells (Zone)	Winter Weather	0	0	NR	NR
1/19/2012	Wells (Zone)	Winter Weather	0	0	NR	NR
1/20/2012	Wells (Zone)	Winter Weather	0	0	NR	NR
12/26/2012	Wells (Zone)	Winter Weather	0	0	NR	NR
12/28/2012	Wells (Zone)	Winter Weather	0	0	NR	NR
1/27/2013	Wells (Zone)	Winter Weather	0	0	NR	NR
2/22/2013	Wells (Zone)	Winter Weather	0	0	NR	NR
2/26/2013	Wells (Zone)	Winter Weather	0	0	NR	NR
3/5/2013	Wells (Zone)	Heavy Snow	0	0	NR	NR
3/24/2013	Wells (Zone)	Heavy Snow	0	0	NR	NR
12/13/2013	Wells (Zone)	Winter Storm	0	0	NR	NR
1/1/2014	Wells (Zone)	Winter Weather	0	0	NR	NR
1/5/2014	Wells (Zone)	Winter Storm	0	0	NR	NR
2/1/2014	Wells (Zone)	Winter Storm	0	0	NR	NR
2/4/2014	Wells (Zone)	Winter Storm	0	0	NR	NR
2/17/2014	Wells (Zone)	Winter Weather	0	0	NR	NR
3/12/2014	Wells (Zone)	Winter Storm	0	0	NR	NR

** NR=None Reported*

Geographic Location for Winter Storm Hazard

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

Hazard Extent for Winter Storm Hazard

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

Risk Identification for Winter Storm Hazard

Based on historical information, the probability of a winter storm is medium to high, and the potential impact may be moderate; therefore the overall risk of a winter storm in Wells County is fairly moderate.

Vulnerability Analysis for Winter Storm Hazard

Winter-storm impacts are distributed equally across the entire jurisdiction; therefore the entire county is vulnerable to a winter storm and can expect the same impacts within the affected area.

Certain populations—such as seniors age 65 or older, infants and young children under five years of age, pregnant women, the homeless or poor, and people with mental illnesses, disabilities, and chronic diseases—are at greater risk to the effects of winter storms.

Facilities

All facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as other buildings within the jurisdiction. These impacts include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow. Names and locations of critical and essential facilities are in Appendix C.

Building Inventory

The impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow.

Infrastructure

During a winter storm, the types of infrastructure that could be impacted include roadways, runways, utility lines/pipes, railroads and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these structures could become damaged during a winter storm. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads, runways and railways, and broken water pipes. Additionally, aerial navigations aids in Wells County, including components of the national air traffic control system, could be damaged or destroyed possibly impacting nationwide air travel.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

Because the winter-storm events are regional in nature, future development will be impacted equally across the county. Any new development within the county will remain vulnerable to these events.

5.3.5 Tornadoes

Tornadoes can occur at any time during the day or night. The unpredictability of tornadoes makes them one of Indiana's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles an hour will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings.

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

Tornadoes are classified according to the Fujita tornado intensity scale[19] as shown in Table 25 on the following page.

[19] NOAA Storm Prediction Center, http://www.srh.noaa.gov

Table 25: Enhanced Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
EF0 *Gale*	65-85 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
FE1 *Moderate*	86-110 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
EF2 *Significant*	111-135 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
EF3 *Severe*	136-165 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
EF4 *Devastating*	166-200 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
EF5 *Incredible*	Over 200 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Recent Occurrences of Tornadoes

The NCDC database reported no recent occurrences of tornado events since 2007; however, there were three significant tornado events in Wells County since June of 1998 that have impacted multiple communities. The Wells County NCDC-recorded tornadoes are identified in Table 26. Additional details for NCDC events are included in Appendix C.

Table 26: Wells County NCDC-Reported Tornadoes (1998-2014)

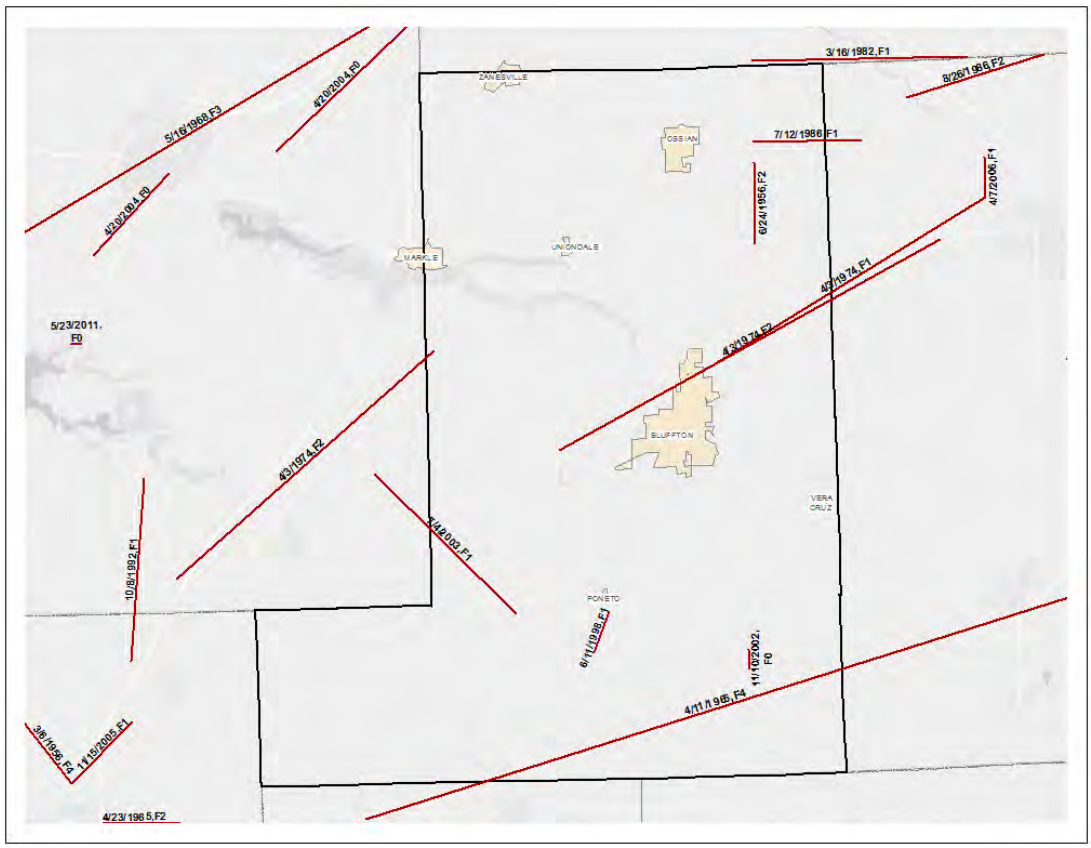
Location	Date	Type	Death	Injury	Property Damage	Crop Damage*
Poneto	6/11/1998	F1 Tornado	0	0	$150,000	NR
Liberty Center	7/4/2003	F1 Tornado	0	0	$50,000	NR
Petroleum	11/10/2002	F0 Tornado	0	0	$5,000	NR

**NR=None Reported*

Geographic Location for Tornadoes

The entire county has the same risk for tornadoes because they can occur at any location. The NCDC identified 9 tornado events since 1950, which are shown in Figure 33.

Figure 33: Historical Tornado Paths 1950-2013



Hazard Extent for Tornadoes

The historical tornadoes generally moved from southwest to northeast across the county. The extent of the hazard varies in terms of the extent of the path and the wind speed. Tornadoes can occur at any location within the county.

Risk Identification for Tornadoes

Based on historical information, the probability of a tornado is medium, and the potential impact of a tornado is moderate-significant; therefore the overall risk of a tornado in Wells County is moderate.

Vulnerability Analysis for Tornadoes

Tornadoes can occur within any area in the county; therefore the entire county population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan will consider all buildings within the county as vulnerable.

Essential Facilities

All essential facilities are vulnerable to tornadoes. An essential facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts will vary, based on the magnitude of the tornado, but can include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community).

Building Inventory

The same impacts to buildings within the county can be expected. The impacts are similar to those discussed for critical facilities and include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of building function (e.g., damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

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

GIS Tornado Analysis

2007 Tornado Analysis

For the 2007 MHMP, we modeled an F4 tornado along a historical F4 tornado path that ran for fifteen miles through the Bluffton area in 2006. The analysis estimated that 1,828 buildings would be damaged with losses totaling $170 million.

The following analysis completed for the 2015 plan update utilizes an example scenario to gauge the anticipated impacts of tornadoes in the county in terms of numbers and types of buildings and infrastructure.

GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical tornado path that runs for 30.69 miles through Bluffton. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 27 depicts tornado damage curves as well as path widths.

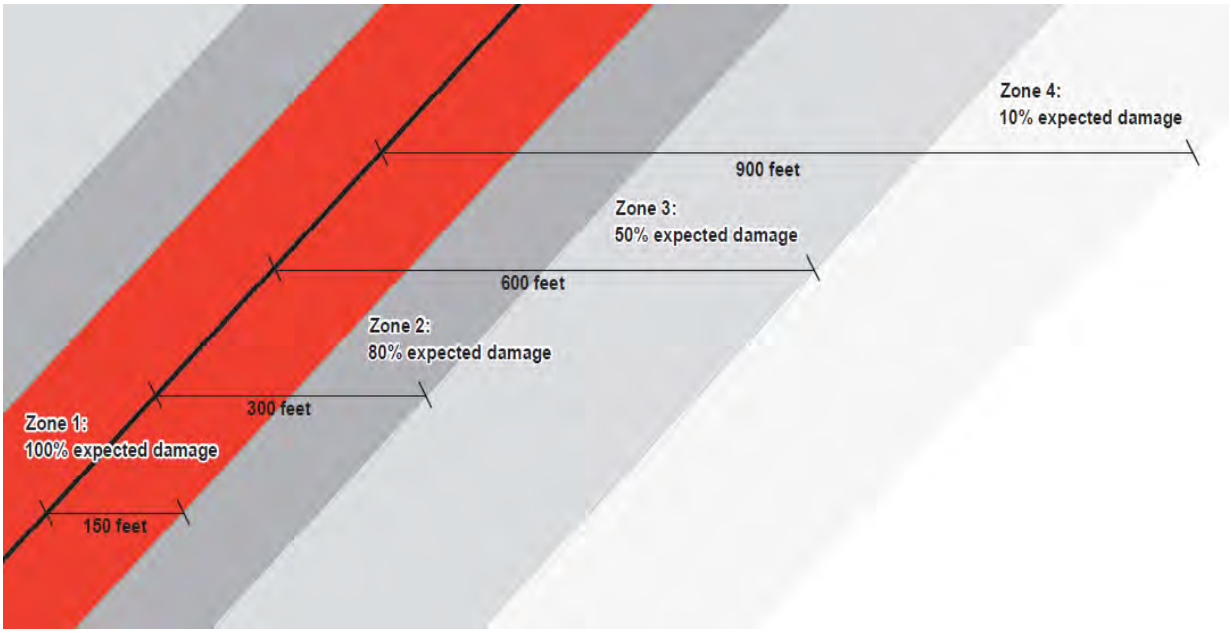
Table 27: Tornado Path Widths and Damage Curves

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

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with a decreasing amount of damage away from the center of the path. This natural process was modeled in GIS by adding damage zones around the tornado path.

Figure 34 and Table 28 describe the zone analysis.

Figure 34: GIS Analysis Using Tornado Buffers



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

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

Table 28: Tornado Zones and Damage Curves

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

The hypothetical tornado path is depicted in Figure 35 and the damage curve buffers are in Figure 36.

Figure 35: Hypothetical F4 Tornado Path in Wells County

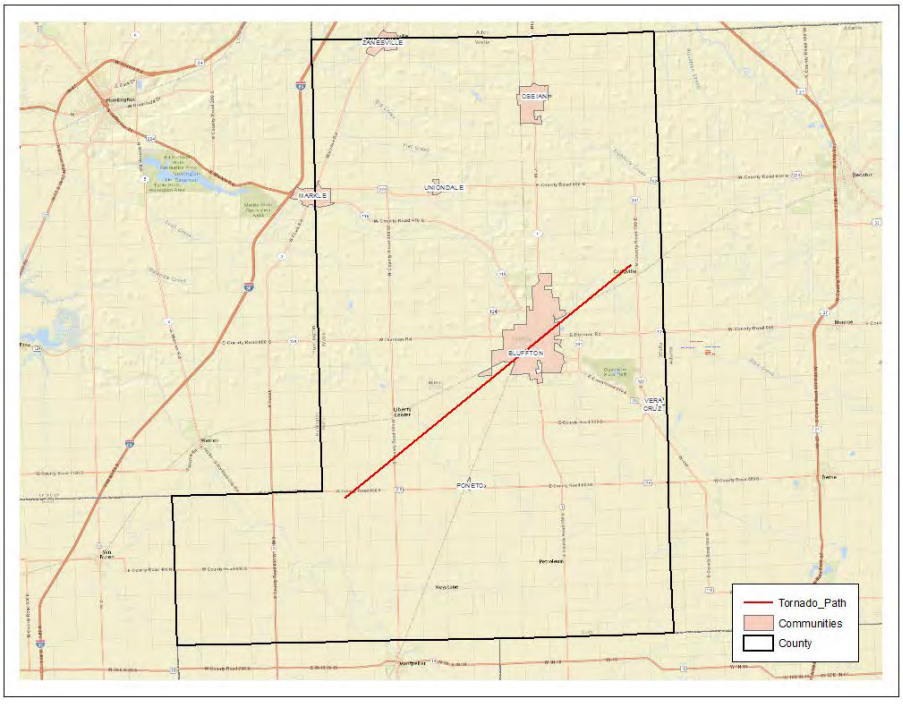
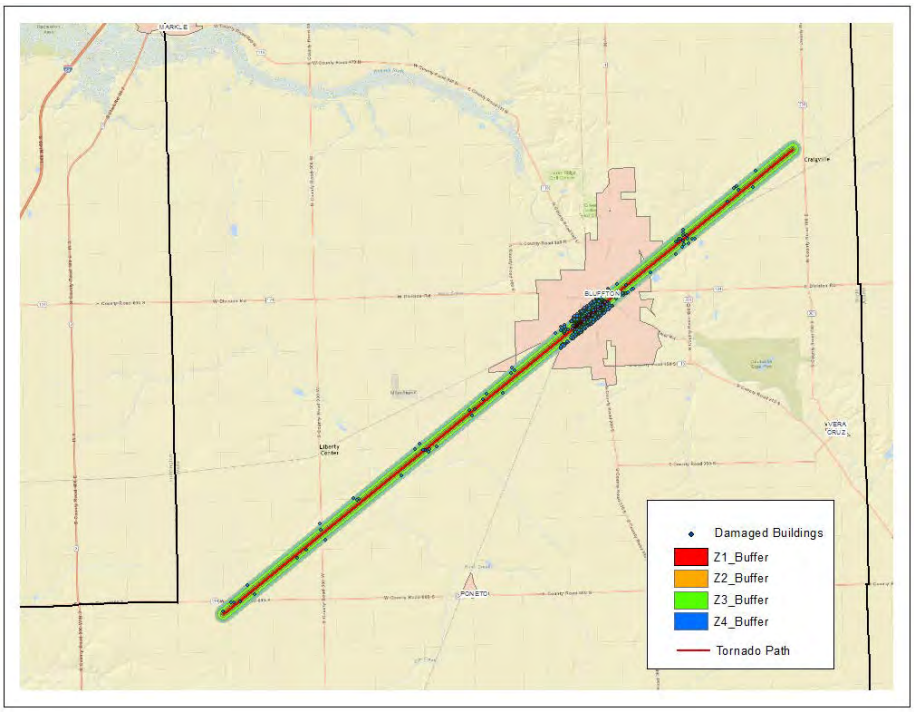


Figure 36: Modeled F4 Tornado Damage Buffers in Wells County



The GIS analysis estimates that 761 buildings will be damaged. The estimated building losses were $76.2 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels that were joined with Assessor records showing property replacement value.

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

The results of the analysis are depicted in Tables 29 and 30.

Table 29: Estimated Numbers of Buildings Damaged by Occupancy Type

Occupancy	Damaged Buildings
Agricultural	13
Commercial	88
Education	2
Government	14
Industrial	6
Religious	16
Residential	622

Table 30: Estimated Building Losses by Occupancy Type

Occupancy	Building Losses
Agricultural	773,088
Commercial	11,535,579
Education	77,991
Government	6,378,637
Industrial	648,559
Religious	7,078,544
Residential	49,750,847

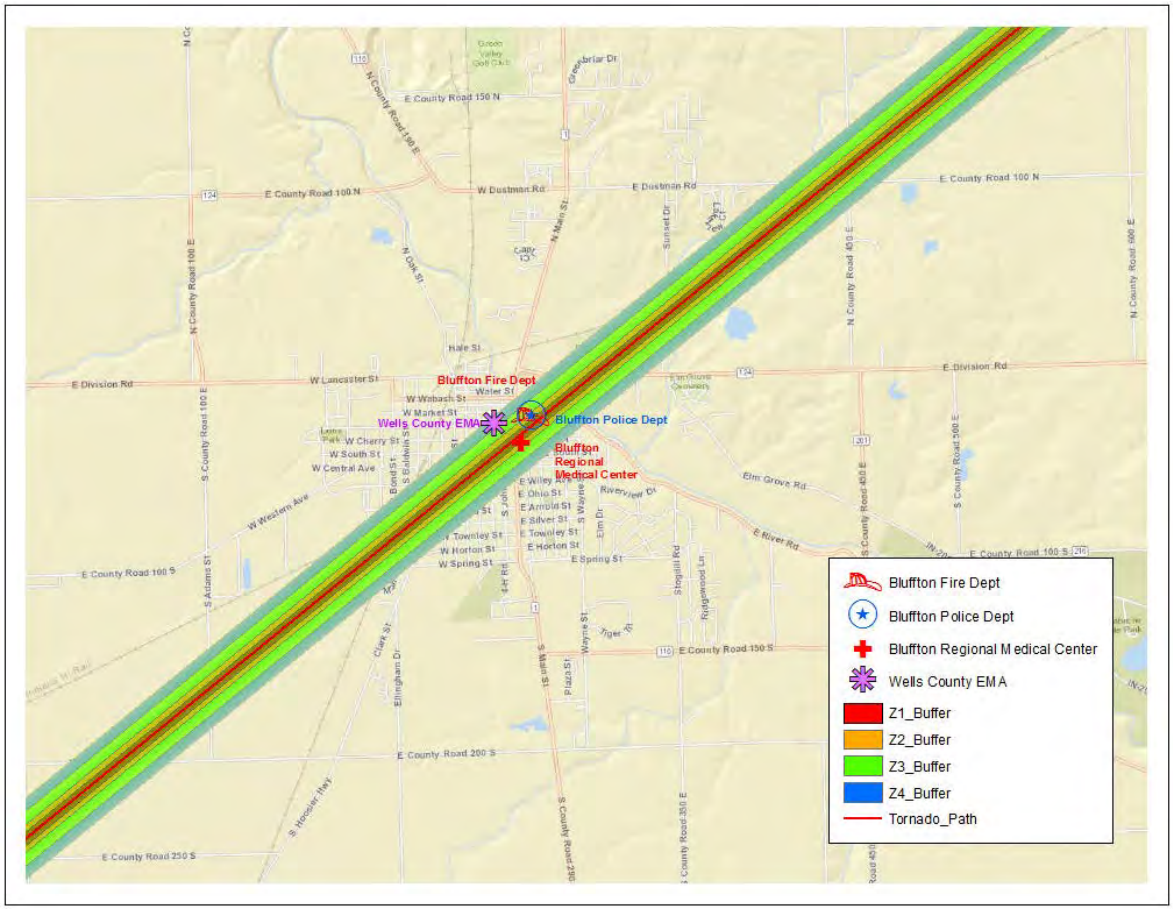
Essential Facilities Damage

There are four essential facilities located within 600 feet of the hypothetical tornado path. The model predicts that one Medical Care Center, one Fire Station, one Police Station and one Emergency Operation Center would experience damage. The affected facilities are identified in in Table 31, and their geographic locations are shown in Figure 37.

Table 31: Estimated Essential Facilities Affected

Facility Name
Bluffton Regional Medical Center
Bluffton Fire Department
Bluffton Police Department
Wells County EMA

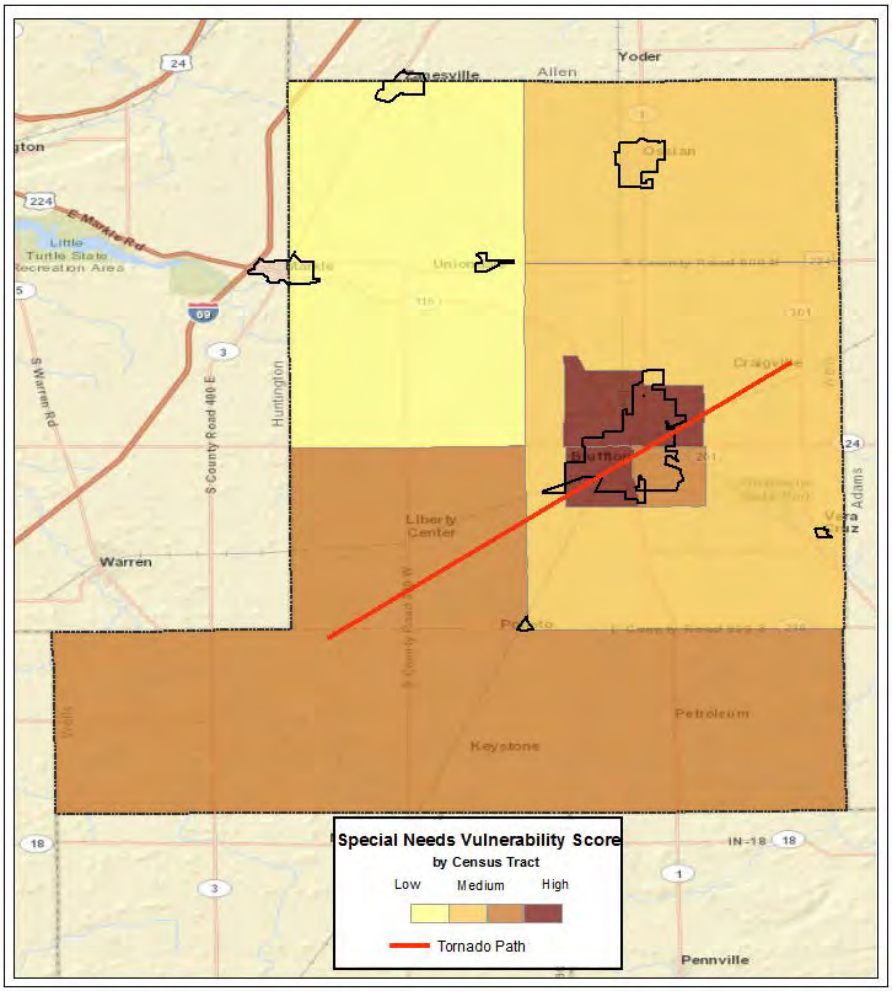
Figure 37: Modeled F3 Tornado Damage Buffers in Wells County



Tornado Dangers to Vulnerable Populations

Vulnerable populations are more susceptible to dangers due to natural disasters. The tornado scenario modeled is an F4 tornado running across Bluffton. This community is located in area with a high Special Needs Vulnerability score. The census tracts within Bluffton have relatively higher vulnerability score compared to the rest of the county. The census tract including Bluffton has the highest percentage (18.4%) of its residents living in poverty, with 12.4% having a disability. Bluffton also has highest percentage of its residents who are above sixty-five years of age (29%). Figure 38 on the following page illustrates Special Needs Vulnerability score by census tract.

Figure 38: Tornados in Areas with Special Needs Populations



Future Development Trends and Vulnerability to Future Assets/Infrastructure for Tornado Hazard

Due to the unpredictability of this hazard, all buildings and infrastructure in Wells County are at risk of damage including temporary or permanent loss of function. For tornadoes, it is not possible to isolate specific essential or non-essential facilities that would be more or less vulnerable to damages.

5.3.6 Fire Hazard

This plan will identify four major categories of fires within the county: tire/scrap fires, structural fires, wildfires, and arson.

Tire Fires

The state of Indiana generates thousands of scrap tires annually. Many of those scrap tires end up in approved storage sites that are carefully regulated and controlled by federal and state officials. However, scrap tires are sometimes intentionally dumped in unapproved locations throughout the state. Wells County has no approved locations for tire disposal and storage, but the number of unapproved locations cannot be readily determined. Wells County has 1 day annually for free tire disposal through the Solid Waste Program. Also a Business in Bluffton has a tire disposal daily for a small fee. These illegal sites are owned by private residents who have been continually dumping waste and refuse, including scrap tires, at those locations for many years.

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

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

Structural Fires

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

Wildfires

Approximately 35% to 55% of Indiana's land base is heavily wooded or forested. When hot and dry conditions develop, forests may become vulnerable to devastating wildfires. In the past few decades an increased commercial and residential development near forested areas has dramatically changed the nature and scope of the wildfire hazard. In addition, the increase in structures resulting from new development strains the effectiveness of the fire service personnel in the county.

Arson

It is important to note that arson is a contributing factor to fire-related incidents within the county. According to the United States Fire Administration, approximately 22% of the total fires reported in the nation from 2001 to 2002 were of incendiary or suspicious nature.

Recent Occurrences of Fires

There have been no significant occurrences of fire events since 2007; however, minor fires, or those that do not result in death or injury, occur annually.

Geographic Location for Fires

Fire hazards occur countywide and therefore affect the entire county. Areas with heavy forestation and areas with older wooden infrastructure have a higher chance of widespread fire hazard.

Hazard Extent for Fires

The extent of the fire hazard varies both in terms of the severity of the fire and the type of material being ignited. All communities in Wells County may be at risk of a fire.

Risk Identification for Fires

Based on historical information, the probability of a significant fire is low-medium, and the potential impact may be moderate; therefore the overall risk of a winter storm in Wells County is moderate.

Vulnerability Analysis for Fires

Fires can occur within any area in the county; therefore the entire county population and all buildings are vulnerable to fires. To accommodate this risk, this plan will consider all buildings within the county as vulnerable.

Facilities

All essential and critical facilities are vulnerable to fire hazards. These facilities will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural damage from fire and water damage from efforts extinguishing fire.

Building Inventory

The same impacts to buildings within the county can be expected. The impacts are similar to those discussed for essential and critical facilities and include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of building function (e.g., damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a fire, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Because the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these structures could become damaged during a fire. Potential impacts include structural damage resulting in impassable roadways and power outages.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Fire Hazard

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

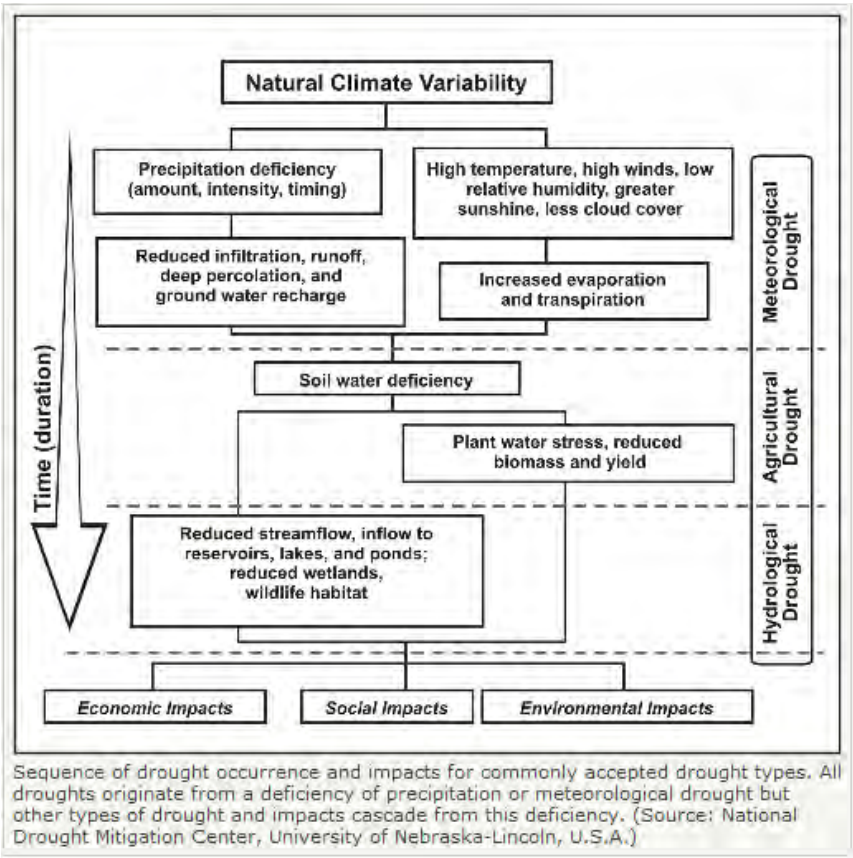
5.3.7 Drought Hazard

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

There are several common types of droughts including meteorological, hydrological, agricultural, and socioeconomic. Figure 39 describes the sequence of drought occurrence and impacts of drought types.

- **Meteorological:** Defined by the degree of dryness (as compared to an average) and the duration of the dry period. These are region-specific and only appropriate for regions characterized by year-round precipitation.
- **Hydrological:** Associated with the effects of periods of precipitation shortfalls (including snow) on surface or subsurface water supply, e.g. stream flow, reservoir and lake levels, and groundwater. Impacts of hydrological droughts do not emerge as quickly as meteorological and agricultural droughts. For example, deficiency on reservoir levels may not affect hydroelectric power production or recreational uses for many months.
- **Agricultural:** Links characteristics of meteorological or hydrological drought to agricultural impacts. An agricultural drought accounts for the variable susceptibility of crops during different stages of crop development from emergence to maturity.
- **Socioeconomic:** Links the supply and demand of some economic good, e.g. water, forage, food grains, and fish, with elements of meteorological, hydrological, or agricultural droughts. This type of drought occurs when demand for an economic good exceeds supply as a result of weather-related shortfall in water supply.

Figure 39: Sequence of Drought Occurrence and Impacts



Sequence of drought occurrence and impacts for commonly accepted drought types. All droughts originate from a deficiency of precipitation or meteorological drought but other types of drought and impacts cascade from this deficiency. (Source: National Drought Mitigation Center, University of Nebraska-Lincoln, U.S.A.)

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

In the past decade, the U.S. has continued to consistently experience drought events with economic impacts greater than $1 billion; FEMA estimates that the nation's average annual drought loss is $6 billion to $8 billion. For Indiana alone, the National Drought Mitigation Center reported hundreds of drought impacts from June 2010 through October 2010 ranging from water shortage warnings to reduced crop yields and wild fires.

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

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

The Palmer Drought Severity Index (PDSI), developed by W.C. Palmer in 1965, is a soil moisture algorithm utilized by most federal and state government agencies to trigger drought relief programs and responses. The PDSI—shown in Table 32—is based on the supply-and-demand concept of the water balance equation, taking into account more than just the precipitation deficit at specific locations. The objective of the PDSI is to provide standardized measurements of moisture, so that comparisons can be made between locations and periods of time—usually months. The PDSI is designed so that a -4.0 in South Carolina has the same meaning in terms of the moisture departure from a climatological normal as a -4.0 does in Indiana.

Table 32: Palmer Drought Severity Classifications

Classification Rating	Classification Description
4.0 or greater	Extremely Wet
3.0 to 3.99	Very Wet
2.0 to 2.99	Moderately Wet
1.0 to 1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to -0.99	Incipient Dry Spell
-1.0 to -1.99	Mild Drought
-2.0 to -2.99	Moderate Drought
-3.0 to -3.99	Severe Drought
-4.0 or less	Extreme Drought

Previous Occurrences for Drought Hazard

Although the NCDC database reports numerous drought events that affected Indiana in the past five years, there are no reports of drought directly impacting Wells County.

Geographic Location for Drought Hazard

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

Hazard Extent for Drought

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

Risk Identification for Drought Hazard

The planning team determined that the probability of drought hazard is low-medium in Wells County, and the impact of such an event is moderate, resulting in an overall calculated risk of low-medium.

Vulnerability Analysis for Hazard

Droughts affect mostly humans, particularly special needs populations, and animals. These events may be exacerbated by power loss. For this planning effort, it was not possible to analyze the number of lives or amount of property exposed to the impacts of drought.

Drought impacts can be an equally distributed threat across the entire jurisdiction; therefore the county is vulnerable to this hazard and can expect the same impacts within the affected area. The entire population and all buildings have been identified as at risk.

Facilities

All facilities included in this plan are vulnerable to drought. These facilities will encounter many of the same impacts as any other building within the jurisdiction, which should involve only minor damage. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather. A complete list of essential and critical facilities and their locations is included as Appendix C.

Building Inventory

The other buildings within the county can all expect the same impacts similar to those discussed for the essential and critical facilities. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather.

Infrastructure

During a drought the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with a fire that could result from the hot, dry conditions. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these infrastructure components could be impacted during a drought.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Drought Hazard

Future development will remain vulnerable to these events. Typically, some urban and rural areas are more susceptible than others. For example, urban areas are subject to water shortages during periods of drought. Excessive demands of the populated area place a limit on water resources. In rural areas, crops

and livestock may suffer from extended periods of heat and drought. Dry conditions can lead to the ignition of wildfires that could threaten residential, commercial, and recreational areas.

Because droughts are regional in nature, future development will be impacted across the county. Although urban and rural areas are equally vulnerable to this hazard, those living in urban areas may have a greater risk from the effects of a prolonged heat wave. According to FEMA, the atmospheric conditions that create extreme heat tend to trap pollutants in urban areas, adding contaminated air to the excessively hot temperatures and creating increased health problems. Furthermore, asphalt and concrete store heat longer, gradually releasing it at night and producing high nighttime temperatures. This phenomenon is known as the “urban heat island effect”.

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

5.3.8 Earthquake Hazard

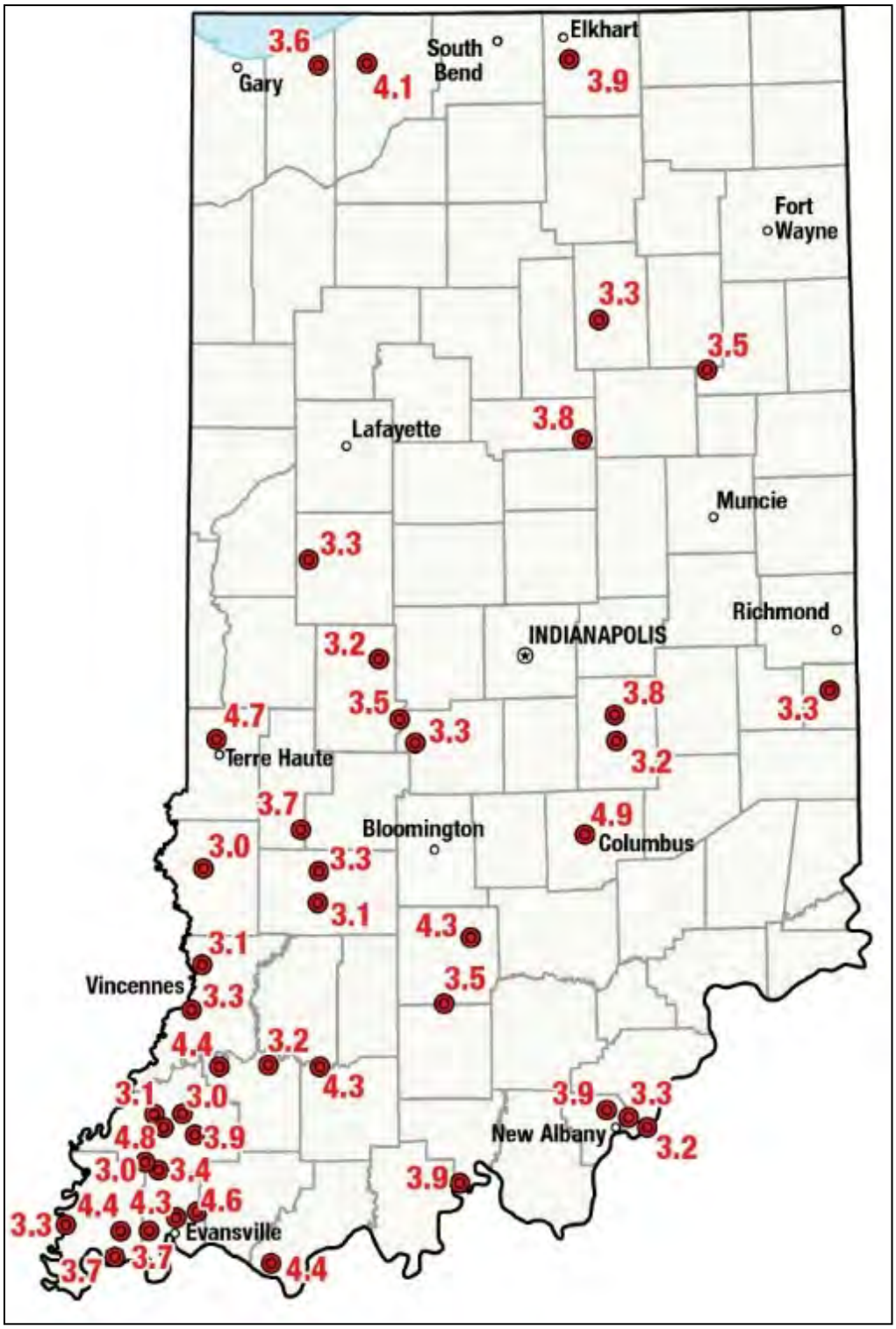
Hazard Definition for Earthquake Hazard

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped Earth as the huge plates that form the Earth's crust collide, move away from, and slide past each other. This movement is extremely slow. However, when sections of the plates are locked together, stored energy is accumulated. When the accumulated energy grows strong enough, the portions of the plate break free, causing the earthquake.

Ninety-five percent of earthquakes occur at the plate boundaries; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area in the Central United States is referred to as the New Madrid Seismic Zone. Scientists have learned that the New Madrid fault system may not be the only fault system in the central US capable of producing damaging earthquakes. The Wabash Valley Fault System in Indiana shows evidence of large earthquakes in its geologic history, and there may be other currently unidentified faults that could produce strong earthquakes. Figure 40 depicts Indiana’s historical earthquake epicenters.

Ground shaking from strong earthquakes can collapse buildings and bridges; disrupt gas, electric, and communication (e.g. phone, cable, Internet) services; and sometimes trigger landslides, flash floods, and fires. Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers or homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

Figure 40: Indiana Historical Earthquake Epicenters[20]



[20] Indiana Geological Survey

The Modified Mercalli Intensity Scale is an arbitrary ranking based on observed effects that used in the United States to evaluate the intensity of earthquakes. Table 33 describes the 12 increasing levels of the scale. Table 34 shows how the Modified Mercalli Intensity Scale compares to earthquake magnitude.

Table 33: Modified Mercalli Intensity Scale

Modified Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Table 34: Earthquake Magnitude vs. Modified Mercalli Intensity Scale

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

Previous Occurrences for Earthquake Hazard

At least 43 earthquakes, M3.0 or greater, have occurred in Indiana since 1817. The last such event was a M3.1 centered just north of Vincennes on May 10, 2010. A M3.8 earthquake occurred near Kokomo in December later that same year with approximately 10,390 individuals submitting felt reports to the USGS.

Geographic Location for Earthquake Hazard

The majority of seismic activity in Indiana occurs in the southwestern region of the state. Earthquakes originate just across the boundary in Illinois and can be felt in Indiana. The M5.2 Mt. Carmel event on April 19, 2008 was felt by residents in Indiana, Kentucky, and many more states across the central US.

Hazard Extent for Earthquake Hazard

The extent of an earthquake is countywide. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. Soils along rivers and other bodies of water have higher water tables and higher sand content. As a result, these areas are more susceptible to liquefaction and land shaking. Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking as a result of water filling the space between individual soil particles. This can cause buildings to tilt or sink into the ground, slope failures, lateral spreading, surface subsidence, ground cracking, and sand blows.

Risk Identification for Earthquake Hazard

Based on historical information, the probability of an earthquake is low, and the potential impact of an earthquake is moderate; therefore the overall risk of an earthquake in Wells County is low-medium.

Vulnerability Analysis for Earthquake Hazard

This hazard could impact the entire jurisdiction equally; therefore the entire county's population and all buildings are vulnerable to an earthquake and can expect the same impacts within the affected area. To accommodate this risk, this plan will consider all buildings within the county as vulnerable.

Facilities

All essential and critical facilities are vulnerable to earthquakes. These facilities would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). Names and locations of essential and critical facilities are in Appendix C.

Building Inventory

Impacts similar to those discussed for critical facilities can be expected for the buildings within the county. These impacts include structural failure and loss of building function that could result in indirect impacts (e.g., damaged homes will no longer be habitable, causing residents to seek shelter).

Infrastructure

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

Hazus-MH Earthquake Analysis

2007 Earthquake Analysis

For the 2007 MHMP, a Hazus-MH analysis of several earthquake scenarios including a 5.5 magnitude with the epicenter at the center of Wells County was simulated. Recent research revealed that the most realistic scenarios are a 7.1 and/or 6.8 magnitude in addition to the 500-year return period. Similar to the flood and tornado models, the 2015 analyses revealed more accurate building damages and losses because the quality and completion of data collected was significantly better than in 2008.

The Polis Center reviewed existing geological information and recommendations for earthquake scenarios and ran four modeling scenarios—two deterministic, one probabilistic, and an annualized loss.

The deterministic scenarios included a 7.7-magnitude epicenter along the New Madrid fault zone and a 6.8-magnitude epicenter in Mount Carmel, Illinois.

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

An earthquake depth of 10.0 kilometers was selected based on input from the Indiana Geological Survey. Hazus-MH also requires the user to define an attenuation function unless ground motion maps are supplied. Because Indiana has experienced smaller earthquakes, the decision was made to use the Central Eastern United States (CEUS) attenuation function.

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

The probabilistic scenario was based on ground-shaking parameters derived from US Geological Survey probabilistic seismic hazard curves. The probabilistic scenario was a 500-year return period scenario.

This analysis evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500-year return period. These analysis options were chosen because they are useful for prioritization of seismic reduction measures and for simulating mitigation strategies.

Results for 7.7 Magnitude- New Madrid, Kentucky Earthquake Scenario

The New Madrid Kentucky (Magnitude 7.7) loss earthquake scenario produced negligible losses**.**

Results for 6.8 Magnitude- Mt. Carmel, Illinois Earthquake Scenario

The extent of the damages from a 6.8 Magnitude at Mt. Carmel, Illinois epicenter would encompass all areas of Wells County.

Building Damages

Hazus estimates that about 48 buildings in Wells County would be at least moderately damaged. This is 0.4% of the buildings in the county. No buildings would be damaged beyond repair. Table 35 on the following page lists the numbers and occupancy types of buildings that would be damaged, Table 36 lists the direct economic losses due to building damage, which consist of income loss and capital stock loss, and Figure 41 maps the building losses in thousands of dollars.

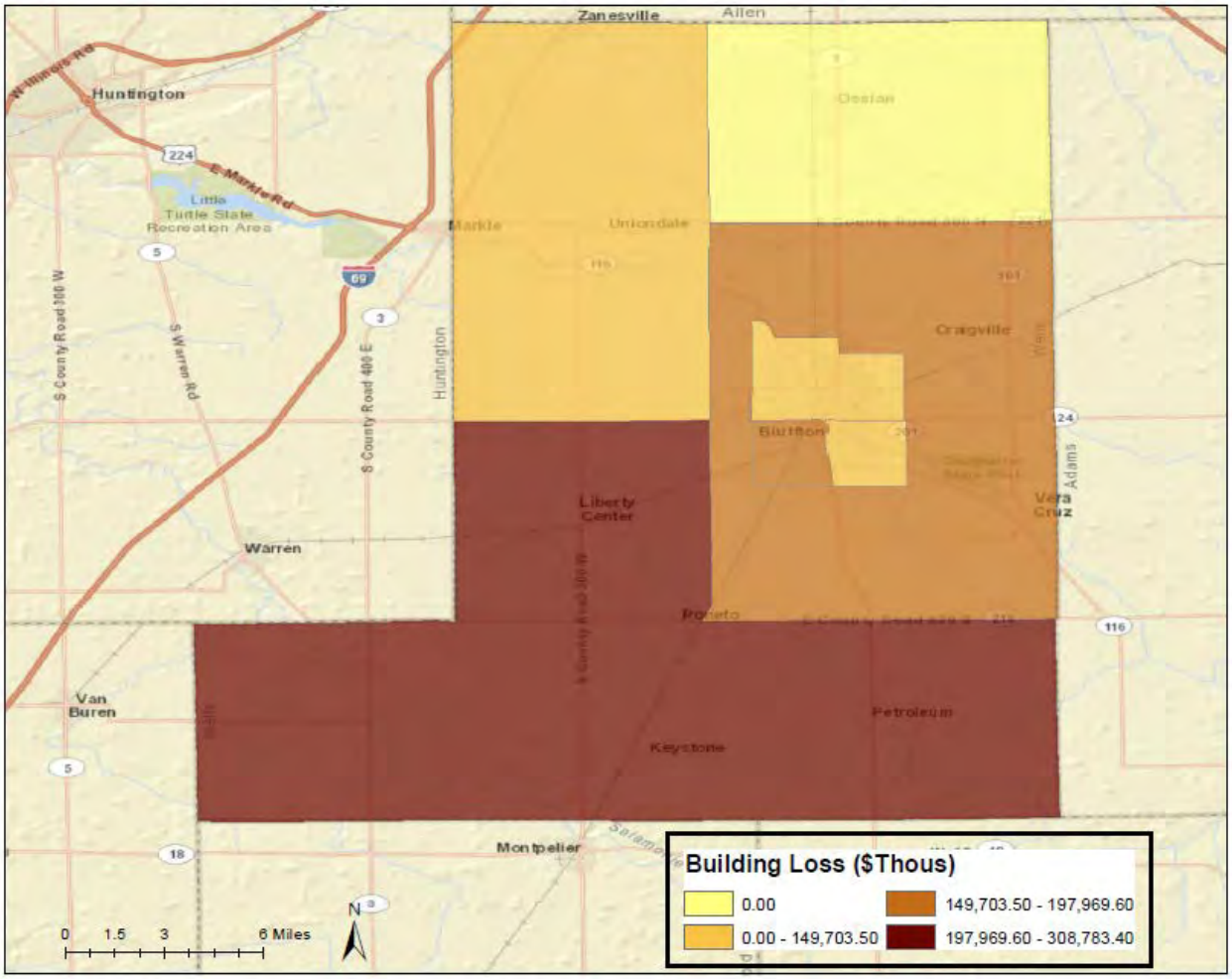
Table 35: Mt. Carmel Scenario - Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,502	13.73	34	20.66	12	28.00	2	32.25	0	22.84
Commercial	440	4.02	8	4.88	2	5.79	0	6.27	0	4.45
Education	15	0.13	0	0.15	0	0.17	0	0.18	0	0.21
Government	67	0.61	1	0.66	0	0.77	0	0.78	0	0.88
Industrial	77	0.70	1	0.86	0	1.11	0	1.21	0	0.71
Other Residential	567	5.19	14	8.22	4	9.12	0	3.40	0	2.61
Religion	127	1.16	3	1.68	1	2.08	0	2.35	0	2.43
Single Family	8,144	74.45	104	62.89	23	52.95	3	53.56	0	65.86
Total	10,939		165		43		5		0	

Table 36: Mt. Carmel Scenario - Building Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.01	0.07	0.02	0.04	0.14
	Capital-Related	0.00	0.00	0.05	0.01	0.02	0.09
	Rental	0.06	0.02	0.06	0.01	0.02	0.17
	Relocation	0.20	0.02	0.08	0.05	0.25	0.61
	Subtotal	**0.26**	**0.06**	**0.27**	**0.08**	**0.34**	**1.01**
Capital Stock Losses							
	Structural	0.18	0.03	0.06	0.04	0.27	0.58
	Non_Structural	0.29	0.06	0.04	0.03	0.11	0.53
	Content	0.02	0.00	0.01	0.01	0.03	0.07
	Inventory	0.00	0.00	0.00	0.00	0.01	0.02
	Subtotal	**0.49**	**0.09**	**0.10**	**0.09**	**0.42**	**1.20**
	Total	**0.75**	**0.15**	**0.38**	**0.17**	**0.76**	**2.21**

Figure 41: Mt. Carmel Illinois Scenario - Building Losses in Thousands of Dollars



Essential Facility Damage

Before the earthquake, the county would have an estimated 1,100 medical care facility beds available for use. On the day of the earthquake, the model estimates that 1,051 beds (96%) would be available for use by patients already in these facilities along with those injured by the earthquake. After one week, 98% of the beds would likely be back in service. By 30 days, 100% would likely be operational.

Table 37: Mt. Carmel Scenario - Essential Facility Damage

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	13	0	0	13
Schools	14	0	0	14
EOCs	1	0	0	1
PoliceStations	3	0	0	3
FireStations	8	0	0	8

Results for Probabilistic 500-Year Earthquake Scenario

The results of the initial analysis, the probabilistic 500-year are depicted in Tables 38 and 39 and Figure 42. Hazus-MH estimates that approximately 112 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. It is estimated that one building will be damaged beyond repair.

The aggregate building related losses totaled $5.59 million; 41% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up more than 43% of the total loss.

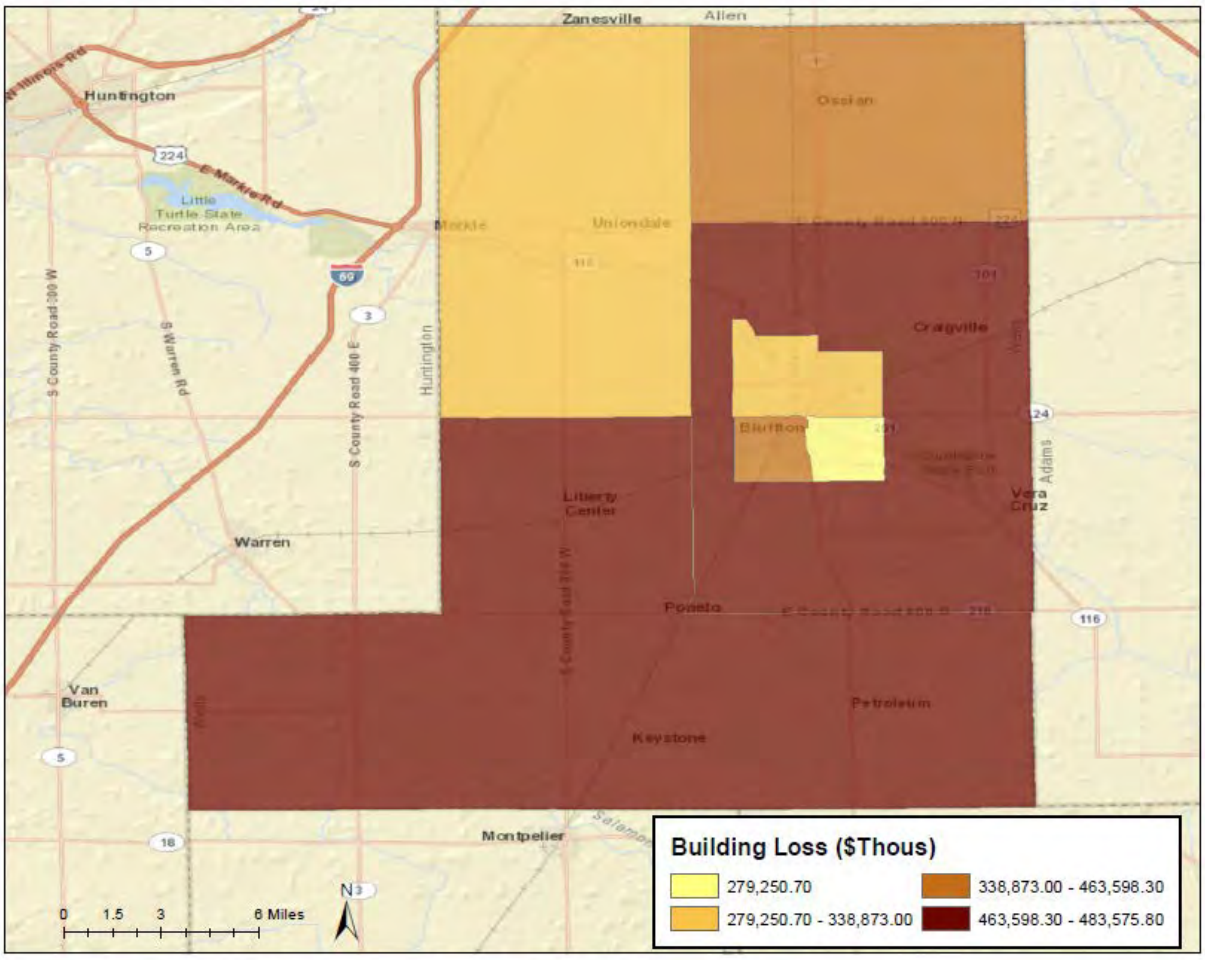
Table 38: Probabilistic 500-Year Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,462	13.68	61	17.14	24	24.08	3	28.60	0	18.45
Commercial	428	4.00	17	4.74	6	5.95	1	6.91	0	4.83
Education	14	0.13	1	0.15	0	0.18	0	0.20	0	0.24
Government	65	0.61	2	0.62	1	0.74	0	0.76	0	0.92
Industrial	75	0.70	3	0.86	1	1.18	0	1.38	0	0.82
Other Residential	550	5.14	26	7.47	9	8.69	0	3.74	0	3.12
Religion	124	1.16	5	1.45	2	1.88	0	2.21	0	2.24
Single Family	7,971	74.58	239	67.57	56	57.30	7	56.18	1	69.38
Total	10,688		353		99		12		1	

Table 39: Probabilistic 500-Year Scenario-Building Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.03	0.18	0.03	0.08	0.32
	Capital-Related	0.00	0.01	0.11	0.02	0.05	0.19
	Rental	0.13	0.06	0.15	0.02	0.05	0.40
	Relocation	0.49	0.05	0.20	0.11	0.53	1.39
	Subtotal	**0.62**	**0.15**	**0.63**	**0.19**	**0.71**	**2.30**
Capital Stock Losses							
	Structural	0.45	0.07	0.13	0.10	0.55	1.29
	Non_Structural	0.84	0.15	0.12	0.12	0.31	1.55
	Content	0.11	0.02	0.04	0.06	0.14	0.38
	Inventory	0.00	0.00	0.00	0.02	0.04	0.07
	Subtotal	**1.40**	**0.24**	**0.30**	**0.30**	**1.04**	**3.29**
	Total	**2.03**	**0.38**	**0.94**	**0.49**	**1.75**	**5.59**

Figure 42: Probabilistic 500-Year Scenario-Building Losses in Thousands of Dollars



Essential Facility Damage

Before the earthquake, the region had 1,100 care facility beds available for uses. On the day of the earthquake, the model estimates that 1,011 care facility beds (92%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 96% of the beds will be back in service. By day 30, 99% will be operational.

Table 40: Probabilistic 500-Year Essential Facility Damage

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	13	0	0	13
Schools	14	0	0	14
EOCs	1	0	0	1
PoliceStations	3	0	0	3
FireStations	8	0	0	8

Annualized Loss Earthquake Scenario

The annualized loss earthquake scenario produced negligible losses.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

Due to the unpredictability of this hazard, all buildings and infrastructure in Wells County are at risk of damage including temporary or permanent loss of function. For earthquakes non-reinforced structures are more vulnerable to damages. New development vulnerability will be minimal due to new construction codes coupled with the low earthquake probability.

5.3.9 Dam/Levee Failure Hazard

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

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

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

Previous Occurrences for Dam and Levee Failure

There has been no record of dam and levee failure in Wells County so far.

Geographic Location for Dam and Levee Failure

The Indiana Department of Natural Resources and the Wells County planning team identified 3 dams in Wells County. Table 41 summarizes the dam information.

Table 41: Indiana Department of Natural Resources Dam Inventory

Dam Name	Dam Hazard	EAP
Kunkel Lake Dam	Significant	No
Decker Lake Dam	Low	No
Moser Lake Dam	Low	No

A review of the Army Corp of Engineers (USACE) and Indiana Department of Natural Resources' files identified no certified levees in Wells County.

Hazard Extent for Dam and Levee Failure

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

According to the IDNR and the National Inventory of Dams, there is one dam in Wells County which is classified as a significant hazard, which is the Kunkel Lake Dam.

Figure 43: Location of Wells County Dams

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

Risk Identification for Dam/Levee Failure

Based on historical information, the probability of a dam failure is low. The planning team determined that the potential impact of a dam failure is minimal-moderate; therefore, the overall risk of a flood hazard for Wells County is fairly low.

Vulnerability Analysis for Dam and Levee Failure

In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove the levee meets design, operation, and maintenance standards for protection against the "one-percent-annual chance" flood. None of the levees in Wells County currently meet these standards.

Future Development Trends and Vulnerability to Future Assets/Infrastructure for Dam and Levee Failure

The county recognizes the importance of maintaining its future assets, infrastructure, and residents. Inundation maps can highlight the areas of greatest vulnerability in each community. The Wells County Planning Commission reviews new development for compliance with the local zoning ordinance.

5.3.10 Hazardous Materials Release Hazard

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

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

Previous Occurrences of Hazardous Materials Release

Wells County has experienced two major hazardous spill events. One of the incidents was on June 17, 2003, where two people were affected when a tanker truck transporting aqueous ammonia rolled over which caused an ammonia leak. The other incident was on December 19, 2002 where a gas hose broke off the pump at the filling station and caused about 25 gallons of gasoline to leak into the sewers.

Geographic Location for Hazardous Materials Release

The hazardous material release hazards are countywide and primarily are associated with the transport of materials by highway and/or railroad. Interstate 69 runs across the north-west part of the county. US Highway 224 runs through Uniondale. The other state highways that run through the county include State Road 1, State Road 3, State Road 116, State Road 124, State Road 201, State Road 218 and State Road 301.

Norfolk and Western Railway is one of two rail lines in the county which it runs through Ossian, Poneto, Bluffton and small communities. Wabash Central RR Corp (RMW Venture, LLC) Runs through the county in small communities and in Bluffton

Hazard Extent for Hazardous Materials Release

The extent of the hazardous material (referred to as hazmat) release hazard varies in terms of the quantity of material being transported as well as the specific content of the container.

Risk Identification for Hazardous Materials Release

Based on historical information, the probability of a hazmat release is low-medium and the potential impact is minimal-moderate; therefore the overall risk of a hazmat release in Wells County is low.

Vulnerability Analysis for Hazardous Materials Release

Hazardous material impacts are an equally distributed threat across the entire jurisdiction; therefore the entire county is vulnerable to a hazardous material release and can expect the same impacts within the affected area. The main concern during a release or spill is the population affected. This plan will therefore consider all buildings located within the county as vulnerable.

Facilities

All facilities and communities within the county are at risk. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g., a damaged or chemically-contaminated police station will no longer be able to serve the community). Names and locations of critical and essential facilities are in Appendix C.

Building Inventory

During a hazardous material release, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads and bridges. The release or spill of certain substances can cause an explosion. Explosions result from the ignition of volatile products such as petroleum products, natural and other flammable gases, hazardous materials/chemicals, dust, and bombs. An explosion potentially can cause death, injury, and property damage. In addition, a fire routinely follows an explosion, which may cause further damage and inhibit emergency response.

GIS Hazardous Materials Release Analysis

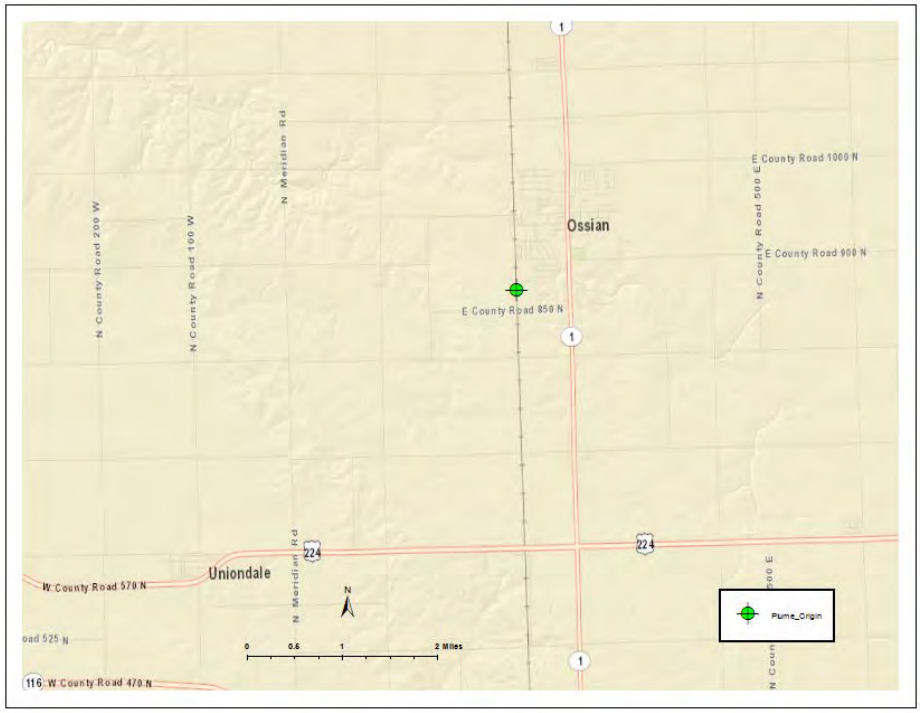
The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for an ammonia release on railroad in Ossian.

Anhydrous ammonia is a clear colorless gas with a strong odor. Contact with the unconfined liquid can cause frostbite. The gas is generally regarded as nonflammable but can burn within certain vapor concentration limits with strong ignition. The fire hazard increases in the presence of oil or other combustible materials. Vapors from an anhydrous ammonia leak initially hug the ground. Prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations has adverse health effects. Anhydrous ammonia is generally used as a fertilizer, a refrigerant, and in the manufacture of other chemicals.

ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Anhydrous ammonia is a common chemical used in industrial operations and can be found in either liquid or gas form. Rail and truck tankers commonly haul ammonia to and from facilities. For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed.

The target area was chosen due to its proximity to densely populated areas. This rail line runs through Ossian, Bluffton, Poneto and other smaller communities. The geographic area covered in this hypothetical analysis is depicted in Figure 44.

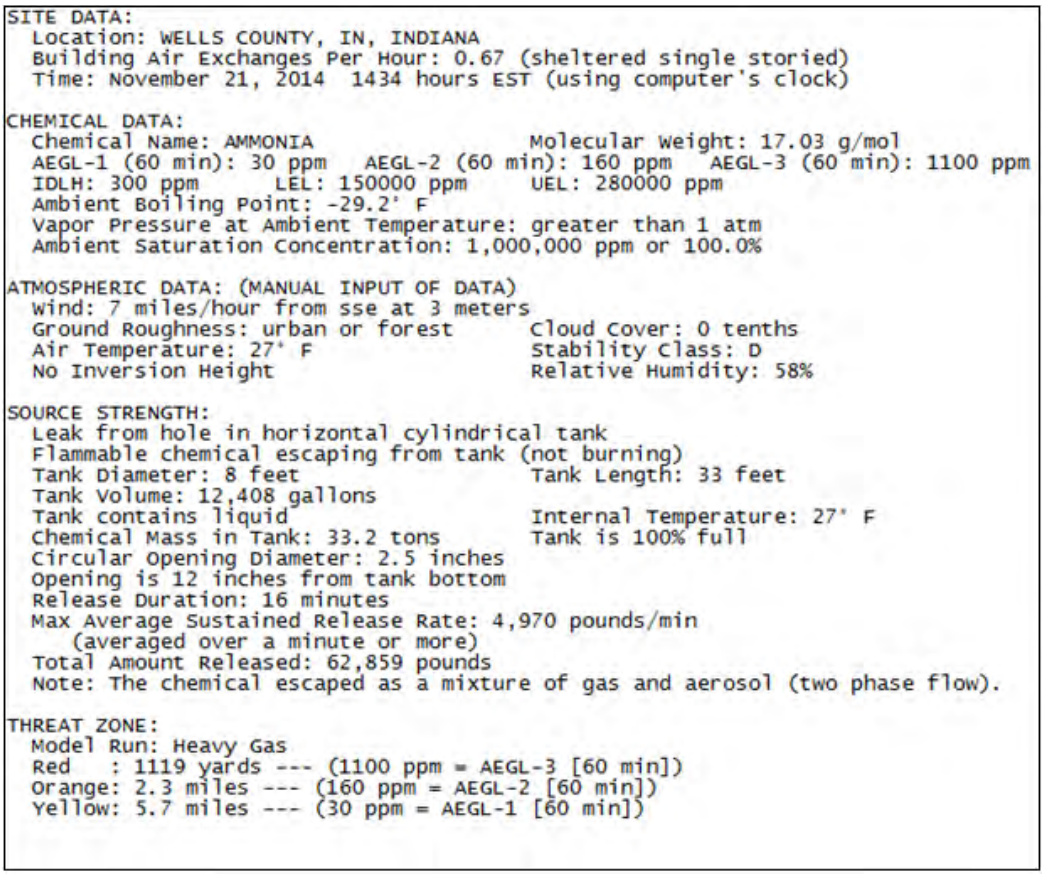
Figure 44: Location of Chemical Release



The ALOHA atmospheric modeling parameters, depicted in Figure 45, were based upon a southwest wind speed of 5 MPH. The temperature was 66°F with 72% humidity and partly cloudy skies.

The source of the chemical spill is a cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 100% full. The ammonia in this tank is in its liquid state. This release was based on a leak from a 2.5 foot diameter hole, 12 inches above the bottom of the tank.

Figure 45: ALOHA Plume Modeling Parameters



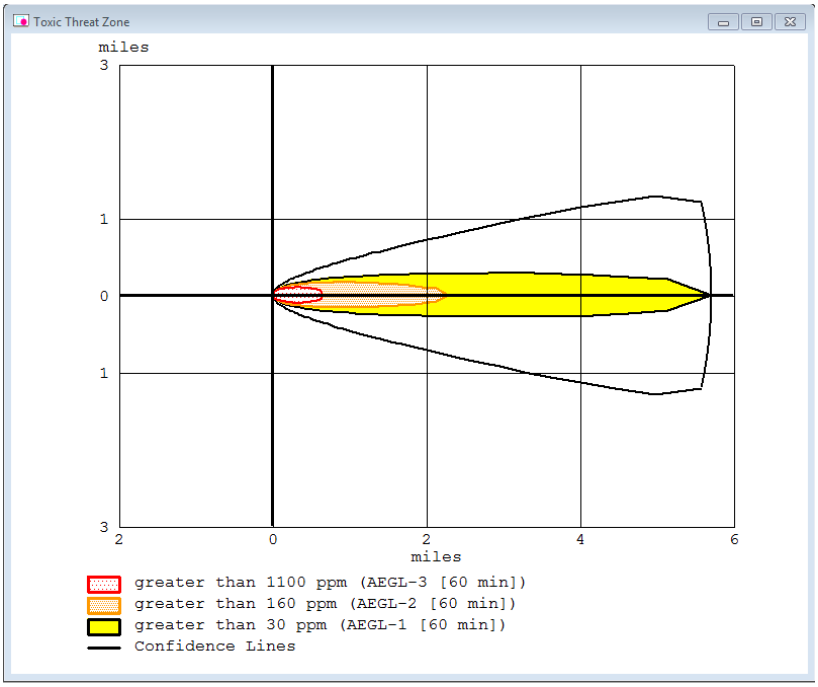
```
SITE DATA:
  Location: WELLS COUNTY, IN, INDIANA
  Building Air Exchanges Per Hour: 0.67 (sheltered single storied)
  Time: November 21, 2014  1434 hours EST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: AMMONIA                  Molecular Weight: 17.03 g/mol
  AEGL-1 (60 min): 30 ppm   AEGL-2 (60 min): 160 ppm   AEGL-3 (60 min): 1100 ppm
  IDLH: 300 ppm      LEL: 150000 ppm      UEL: 280000 ppm
  Ambient Boiling Point: -29.2° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 7 miles/hour from sse at 3 meters
  Ground Roughness: urban or forest       Cloud Cover: 0 tenths
  Air Temperature: 27° F                  Stability Class: D
  No Inversion Height                     Relative Humidity: 58%

SOURCE STRENGTH:
  Leak from hole in horizontal cylindrical tank
  Flammable chemical escaping from tank (not burning)
  Tank Diameter: 8 feet                   Tank Length: 33 feet
  Tank Volume: 12,408 gallons
  Tank contains liquid                    Internal Temperature: 27° F
  Chemical Mass in Tank: 33.2 tons        Tank is 100% full
  Circular Opening Diameter: 2.5 inches
  Opening is 12 inches from tank bottom
  Release Duration: 16 minutes
  Max Average Sustained Release Rate: 4,970 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 62,859 pounds
  Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:
  Model Run: Heavy Gas
  Red    : 1119 yards --- (1100 ppm = AEGL-3 [60 min])
  Orange: 2.3 miles --- (160 ppm = AEGL-2 [60 min])
  Yellow: 5.7 miles --- (30 ppm = AEGL-1 [60 min])
```

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

- AEGL 3: Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.
- AEGL 2: Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- AEGL 1: Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

According to the ALOHA parameters, approximately 145,225 pounds of material would be released per minute. The image in Figure 46 depicts the plume footprint generated by ALOHA.

Figure 46: Plume Footprint Generated by ALOHA

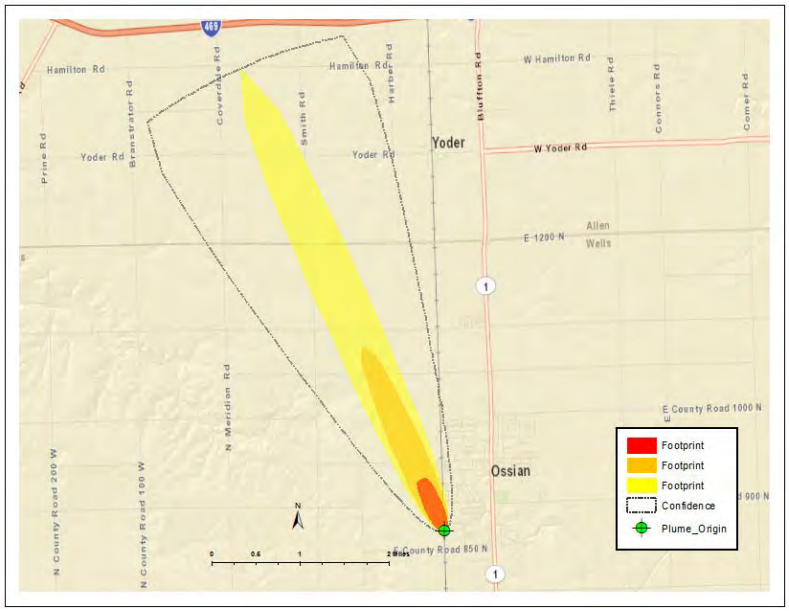


As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). For the purpose of clarification, this report will designate each level of concentration as a specific zone. The zones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

- **Zone 1** (AEGL-3): The red buffer (>=1100 ppm) extends no more than 4.8 miles from the point of release after one hour.
- **Zone 2** (AEGL-2): The orange buffer (>=160 ppm) extends no more than six miles from the point of release after one hour.
- **Zone 3** (AEGL-1): The yellow buffer (>=30 ppm) extends more than six miles from the point of release after one hour.
- **Confidence Lines**: The dashed lines depict the level of confidence in which the exposure zones will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

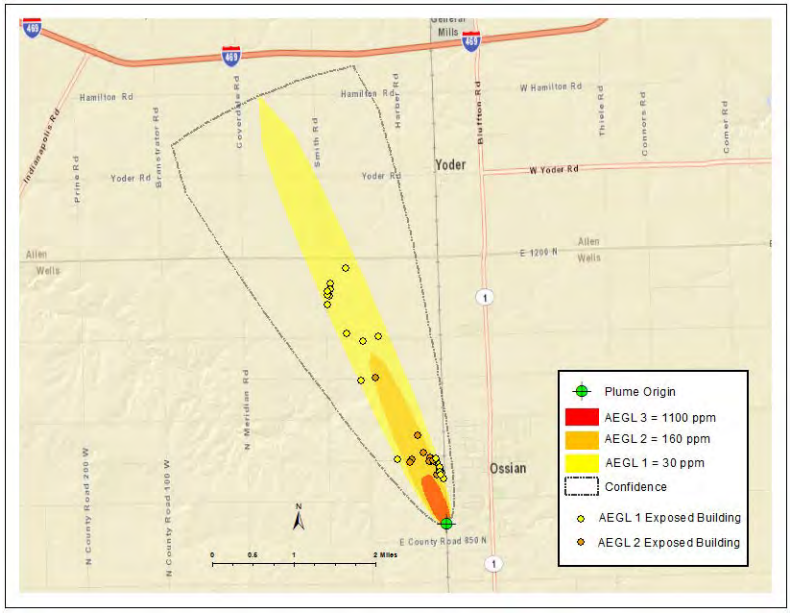
The image in Figure 47 depicts the plume footprint generated by ALOHA.

Figure 47: ALOHA Plume Footprint Overlaid in ArcGIS



The Wells County Building Inventory was added to ArcMap and overlaid with the plume footprint. The Building Inventory was then intersected with each of the four footprint areas to classify each point based upon the plume footprint in which it is located. Figure 48 depicts the Wells County Building Inventory after the intersect process.

Figure 48: Wells County Building Inventory Classified By Plume Footprint



Results

By summing the building inventory within all AEGL zones (Zone 1: 30 ppm, Zone 2: 160 ppm, and Zone 3: 1100 ppm), the GIS overlay analysis predicts that as many as 35 buildings and 88 people could be exposed. The population is estimated based on 2.5 people per residence.

Building Inventory Exposure

The results of the analysis against the Building Inventory points are depicted in the following tables. Table 42 summarizes the results of the chemical spill by combining all AEGL zones.

Table 42: Estimated Exposure for all Zones including Confidence Area (all ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	75	30	3,704,328
Commercial	NA	0	0
Industrial	NA	0	0
Agriculture	NA	5	757,353
Religious	NA	0	0
Government	NA	0	0
Education	NA	0	0
Total	**88**	**35**	**4,461,681**

Tables 43 through 45 summarize the results of the chemical spill for each zone separately. Values represent only those portions of each zone that are not occupied by other zones.

Table 43: Estimated Exposure for Zone 3 (1100 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	0	0	0
Commercial	NA	0	0
Industrial	NA	0	0
Agriculture	NA	0	0
Religious	NA	0	0
Government	NA	0	0
Education	NA	0	0
Total	**0**	**0**	**0**

Table 44: Estimated Exposure for Zone 2 (160 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	53	21	2,622,833
Commercial	NA	0	0
Industrial	NA	0	0
Agriculture	NA	4	593,849
Religious	NA	0	0
Government	NA	0	0
Education	NA	0	0
Total	**63**	**25**	**3,216,682**

Table 45: Estimated Exposure for Zone 1 (30 ppm)

Occupancy	Population	Building Counts	Building Exposure
Residential	23	9	1,081,495
Commercial	NA	0	
Industrial	NA	0	
Agriculture	NA	1	163,504
Religious	NA	0	
Government	NA	0	
Education	NA	0	
Total	**25**	**10**	**1,244,999**

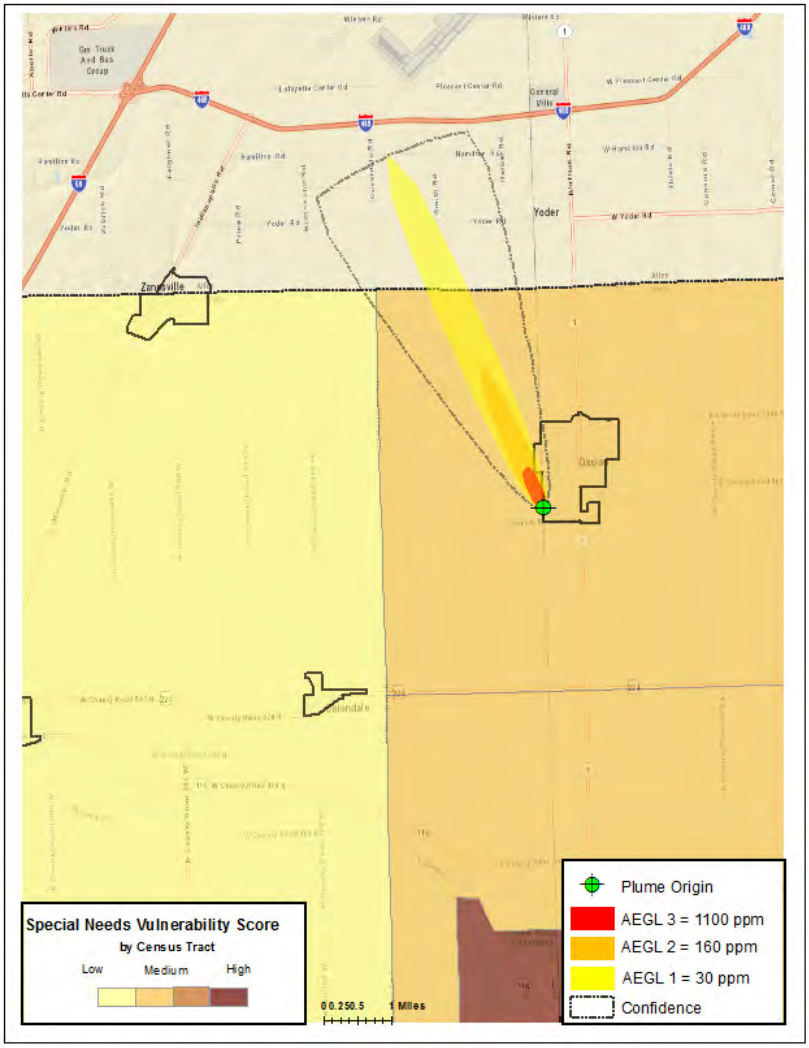
Essential Facilities Exposure

There are no essential facilities within the limits of the chemical spill plume.

Hazmat Dangers to Vulnerable Populations

The scenario modeled is an ammonia plume near Ossian. This community is located in an area with population having a medium vulnerability score. The census tract including this region has 15.1% of its residents who are above 65 years of age. The poverty level when compared with all the communities within the county is 6.1%. Figure 49 on the following page illustrates the Special Needs Vulnerability Score by census tract.

Figure 49: Hazmat Dangers to Special Needs/Vulnerable Populations



Future Development Trends and Vulnerability to Future Assets/Infrastructure for Hazardous Material Release Hazard

Due to the unpredictability of this hazard, all buildings and infrastructure in Wells County are at risk of damage including temporary or permanent loss of function.

Section 6

Mitigation Strategies

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Mitigation actions and projects should be based on a well-constructed risk assessment, provided in Section 5 of this plan. Mitigation should be an ongoing process, adapting over time to accommodate a community's needs.

6.1 Community Action Potential Index (CAPI)

FEMA Region V mitigation planners developed the Community Action Potential Index (CAPI) in 2013 as a tool to prioritize communities for Risk MAP initiatives and mitigation activities. CAPI includes a number of indicators that, when weighted, sum to a total score for each community in the state. This helps federal and state planners determine which communities would be most likely to advance mitigation strategies through the Risk MAP program.

CAPI currently includes index scores for every Indiana community, a total of 661. Of those communities, slightly more than half (325) have been deployed, which means that Risk MAP activities have occurred or are in the process of occurring. All of Wells County's communities are deployed.

Table 46 lists the Indiana communities with the highest CAPI scores (highest possible score is 131). The higher the score, the higher the potential risk the community faces in the event of a disaster. But also, a high score indicates that the community has the potential to move mitigation activities forward. For example, communities that participate in the NFIP's Community Rating System and/or have approved local mitigation plans will be assigned a higher CAPI score.

Table 46: Indiana Communities with Highest CAPI Scores

County Name	Community	Deployed?	CAPI Score
Marion	City of Indianapolis	Yes	92.24
Vanderburgh	Vanderburgh County	No	85.14
Allen	City of Fort Wayne	No	83.62
Bartholomew	City of Columbus	Yes	83.20
Hamilton	City of Noblesville	Yes	79.43

Table 47 lists Wells County communities' high risk factors as well as their composite CAPI scores. As shown in the table, Bluffton has the highest overall CAPI score. The arrows illustrate how the community compares to the state average.

Table 47: Wells County Communities' CAPI Scores

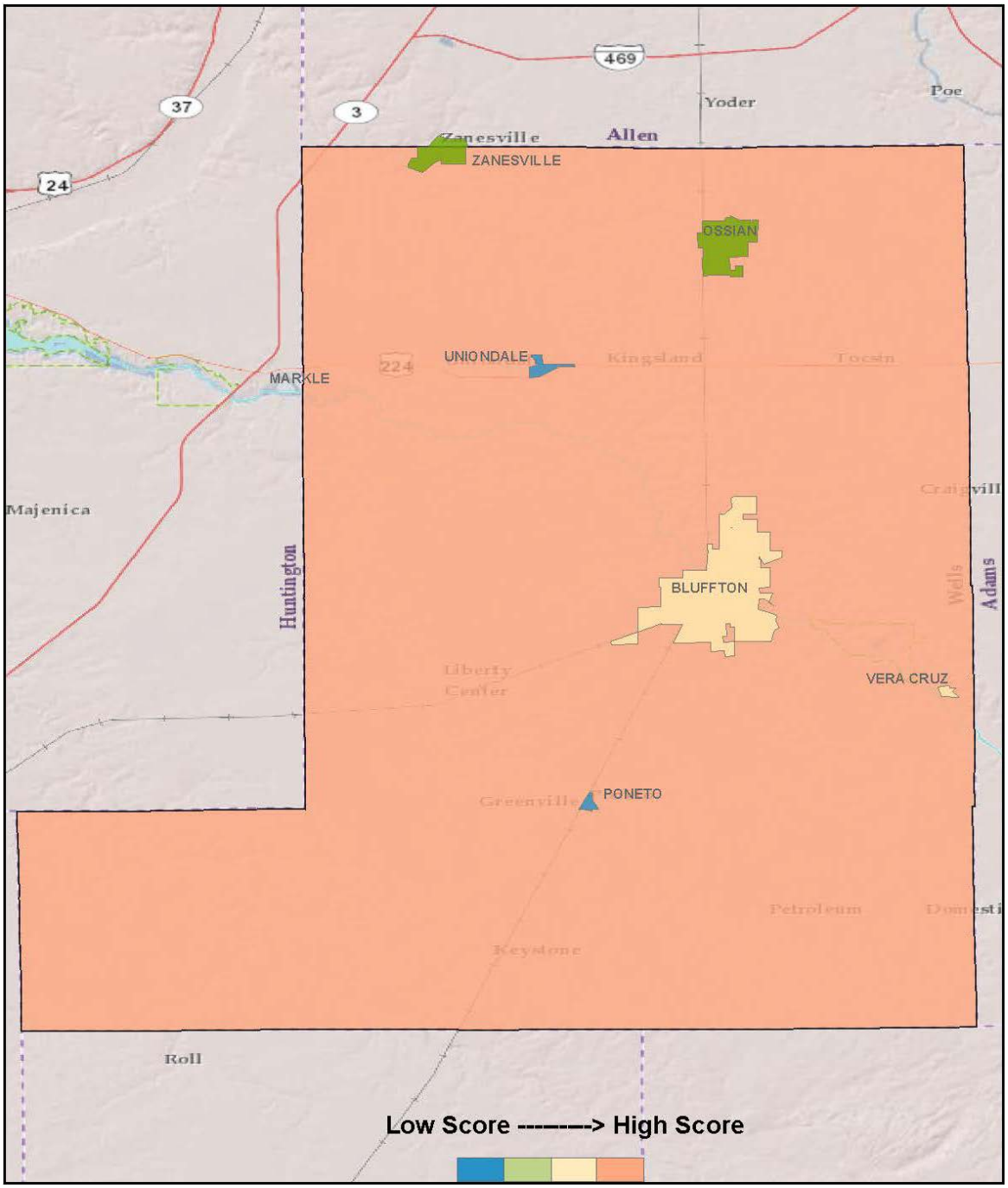
Community Name	Total CAPI Score	% Community within SFHA	Insurance claims $	Insurance claims #	Repetitive loss $	Repetitive loss #	Individual Assistance $ per Capita
Bluffton	▲ 42.60	▲ 8.63%	▼ $261,861.00	▼ 15	▼ $31,054.15	▼ 1	▼ $52.79
Wells County	▲ 27.75	▲ 6.04%	▼ $103,857.00	▼ 6	▼ $0.00	▼ 0	▼ $0.00
Vera Cruz	▼ 21.36	▲ 60.34%	▼ $50,833.00	▼ 6	▼ $0.00	▼ 0	▼ $0.00
Zanesville	▼ 11.30	▲ 19.08%	▼ $0.00	▼ 0	▼ $0.00	▼ 0	▼ $0.84
Ossian	▼ 10.77	▲ 9.49%	▼ $0.00	▼ 0	▼ $0.00	▼ 0	▼ $1.48
Poneto	▼ 10.03	▼ 0.00%	▼ $0.00	▼ 0	▼ $0.00	▼ 0	▼ $77.55
Uniondale	▼ 0.03	▼ 0.00%	▼ $0.00	▼ 0	▼ $0.00	▼ 0	▼ $0.00

KEY:

Better than State Average ▼

Worse than State Average ▲

Figure 50: CAPI Scores for Wells County and Jurisdictions



6.2 Plans and Ordinances

Wells County enforces several ordinances, listed in Table 48, that are relevant to emergency management and disaster planning.

Table 48: Wells County Plans and Ordinances

Community	Ordinance/Year
Wells County	Zoning and Floodplain Management Ordinance, 2013
Wells County	Subdivision Control Ordinance, 2013
Wells County	Stormwater/Drainage Ordinance, 2013

The Wells County Planning Commission is comprised of 12 members, including a representative from the City of Bluffton, the Town of Ossian, the Town of Poneto, the Town of Uniondale, the Town of Vera Cruz, and the Town of Zanesville. The Wells County Planning Commission is responsible for county-wide zoning and ordinances enforcement and has enacted the Wells County Zoning and Floodplain Management Ordinance and Subdivision Control Ordinance.

6.3 Mitigation Goals

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

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

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

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

Objective C: Minimize the amount of infrastructure exposed to hazards.

Objective D: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the community.

Objective E: Improve emergency sheltering in the community.

Goal 2: Create new or revise existing plans/maps for the community

Objective A: Support compliance with the NFIP.

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

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

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

Objective A: Raise public awareness on hazard mitigation.

Objective B: Improve education and training of emergency personnel and public officials.

6.4 Mitigation Process, Prioritization, and Implementation

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

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

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

Public Education and Awareness: Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

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

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

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

MHMP members were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The MHMP members presented their mitigation ideas to the team. The evaluation criteria (STAPLE+E) involved the following categories and questions.

Social:

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

Technical:

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

Administrative:

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

Political:

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

Legal:

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

Economic:

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

Environmental:

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

Implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step was to review the strategies developed for the 2007 MHMP. The planning team was presented with the task of evaluating these strategies and documenting the status of each activity for their jurisdiction.

The second step was to brainstorm a list of new strategies, which in some cases, reiterated 2007 strategies that were not implemented due to lack of funding or resources. Finally, the team decided, based upon many factors, which actions should be undertaken first. In order to pursue the top priority first, an analysis and prioritization of the actions was important. Some actions may occur before the top priority due to financial, engineering, environmental, permitting, and site control issues. Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

The planning team prioritized mitigation actions based on a number of factors. A rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 56. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 55.

Table 49: STAPLE+E Planning Factors

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

6.5 Multi-Jurisdictional Mitigation Strategy and Actions

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

Each of the eight incorporated communities, within and including Wells County, was invited to participate in a brainstorming session in which goals, objectives, and strategies were discussed and prioritized. Each participant in this session was armed with possible mitigation goals and strategies provided by FEMA, as well as information about mitigation projects discussed in neighboring communities. All potential strategies and goals that arose through this process are included in this section.

This section includes a comprehensive list of mitigation strategies from the following initiatives: (1) 2007 MHMP planning process; (2) 2012 Risk MAP Resilience meeting; (3) 2015 MHMP update process. We categorized the progress of each strategy using the following symbols and guidelines.

Mitigation action has been identified and prioritized. Funding has not yet been secured.

Mitigation action is in early phase of implementation. Community has identified source of funding and submitted project proposal. Implementation will begin once funding is secured.

Mitigation project is in progress or ongoing. Funding and/or resources are available to complete it.

Mitigation project is complete.

Table 50 on the following pages lists completed strategies followed by incomplete and new mitigation strategies in order of priority. Assuming funding is available, it is the intention that high priority strategies will be implemented within one year of plan adoption, medium priorities will be implemented within three years, and low priorities will be implemented within five years. When possible, the implementation of these strategies will be incorporated into existing plans, ordinances and local regulations.

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

Table 50: Mitigation Actions for Wells County

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Completed	Establish cooling centers for residents without air conditioning (especially for older residents) *Identified in 2007 MHMP	**COMPLETE**  Public shelters are currently located in several churches and city buildings. The local Red Cross or EMA coordinates sheltering needs. Bluffton Mayor's Office is instrumental in distributing information regarding residents in need of shelter.	☐ Flood ☐ Thunderstorm ☒ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☒ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	
Completed	Provide 8-hour bomb training for all Wells County first responders *Identified in 2007 MHMP	**COMPLETE**  Some officers have been trained, however more comprehensive training would be beneficial.	☐ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☒ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Completed	Purchase & remove 8 Vera Cruz houses damaged by the Great Flood of 2003 to restore natural flood storage *Identified in 2007 MHMP	**COMPLETE**  Although eight homes in Vera Cruz have been bought out, two additional residences remain in a flood prone area.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☒ Vera Cruz ☐ Zanesville	County Surveyors Office FEMA	
Completed	Work with local mobile home parks to tie-down mobile homes with anchors appropriate for certain types of soil *Identified in 2007 MHMP	**COMPLETE**  New mobile home in Wells County are required to be anchored. Existing mobile homes are still vulnerable and modification of local ordinances are needed to address these homes.	☐ Flood ☒ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☒ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☒ Vera Cruz ☐ Zanesville	County Commissioners	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Obtain better data (historical and projected) on the impacts of disasters to re-evaluate and more accurately quantify the vulnerability to humans and the economy *Identified in 2007 MHMP	**IN PROGRESS**  Updating the Wells County Multi-Hazard Mitigation Plan is in progress and will provide vulnerability analysis.	☒ Flood ☒ Thunderstorm ☒ Extreme Temps ☒ Winter Storm ☒ Tornado ☒ Fire ☒ Drought ☒ Earthquake ☒ Dam/Levee ☒ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	
High	Post warning signs in flash flood prone areas for community residents to maintain safe distances *Identified in 2007 MHMP	**INCOMPLETE**  No update since 2007	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County EMA	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Perform a needs assessment for back-up generators at critical facilities to prioritize the order in which generators will be purchased. Establish a plan to purchase these generators *Identified in 2007 MHMP	**IN PROGRESS**  Four generators have recently been purchased for the County. This includes spare generators that can be relocated on demand. Wells County has recognized the need for transfer switches to insure comprehensive use of these mobile generators. The purchase of transfer switches is pending.	☒ Flood ☒ Thunderstorm ☒ Extreme Temps ☒ Winter Storm ☒ Tornado ☒ Fire ☐ Drought ☒ Earthquake ☒ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville		
High	Bridge encroachment over Route 1 to provide direct transportation in flood event. Improve bridges located at 300N and 300W, and restructure the Main Street bridge which is already weakened and vulnerable to encroaching water pressure. *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resilience Report.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☒ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County Highway Department	IDHS

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Conduct study to determine feasibility and cost-benefit analysis of upgrading hospital by elevating utilities and generators *Identified in 2012 Resilience Report	**IN PROGRESS**  Although a study has been completed and backup generators have been installed at the hospital, additional upgrading is needed.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☒ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	Community Development	FEMA
High	Increase size of storm sewer to improve drainage *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. Wells County is concerned with the problems associated with their combined storm/sewer drainage system.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	Public Works	FEMA

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Provide protective measures for sewage treatment plant *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. Based on recent analysis, this sewage treatment plant is located in the floodplain (see Section 5 of this report).	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☒ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County EMA	
High	Remove log jams on Eight Mile Creek *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. This is an ongoing problem and should be addressed as a log term solution.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☒ Zanesville	Public Works	Local funding

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Mobile home park relocation and flood insurance outreach on Eight Mile Creek located along N. 300W 90 *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. About 30 homes in this area are vulnerable; many of these house special needs residents. The vulnerability of this area has been modified with the updated flood mapping.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	Building Code Department	FEMA
High	Zanesville to participate in the NFIP *New strategy	**INCOMPLETE** 	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☒ Zanesville	Local authorities	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
High	Elevate utilities of or add generators to businesses that frequently flood on the NE side of Bluffton *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. A study may be needed to determine if these properties should be buyouts.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☒ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	Building Code Department	
High	Participate in the NFIP Community Rating System *New Action	**PENDING**  The communities of Bluffton, Ossian, Vera Cruz and unincorporated Well County will be members of CRS effective May 1, 2015	☒ Flood ☒ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☒ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville		

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium / High	Repair exposed water line north of sewage treatment plant (damaged as result of fluvial erosion) *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. This is a recurring problem.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☒ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☒ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	INDOT IDHS Silver Jackets	INDOT IDHS OCRA
Medium	Fabricate hoppers donated from a local casting company to make large sand reservoirs for bagging sandbags *Identified in 2007 MHMP	**IN PROGRESS**  FEMA reports pending reciprocal agreements throughout District 3, however more specific mutual aid agreements being in place with all neighboring counties (verbal with Adams County) or local equipment is also required.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	FEMA Adams County	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium	Implement the "Storm Readiness Program" by providing training for the EMA Director, & local Fire and Law Enforcement Departments (also open to anyone). *Identified in 2007 MHMP	**PENDING**  The National Weather Service will be providing training, however this should be an ongoing process. Training will focus on tracking severe weather, reporting back to the Incident Command Center, and warning the public quickly.	☐ Flood ☒ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	
Medium	Continue to develop/improve the Wells County Hazardous Materials Response Plan *Identified in 2007 MHMP	**INCOMPLETE**  No update since 2007. This should be coordinated with the LEPC and should be an ongoing process	☐ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☒ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	LEPC	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium	Provide a public awareness community out-reach exercise where all local emergency responders & volunteers promote fire safety, cold weather safety, severe weather safety (Alert radios), and general health and safety *Identified in 2007 MHMP	**IN PROGRESS**  Outreach services have been provided, however this should be an ongoing practice. Storm Spotter classes are scheduled for March 2015 and 50 weather radios have already been distributed throughout the county.	☒ Flood ☒ Thunderstorm ☒ Extreme Temps ☒ Winter Storm ☒ Tornado ☒ Fire ☒ Drought ☒ Earthquake ☒ Dam/Levee ☒ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA Local fire departments	
Medium	Continue annual hands-on ice rescue scenario practices for the County Ice Rescue Team *Identified in 2007 MHMP	**ONGOING**  In 2014 local fire departments participated in rescue training, however it is recognized that recurrent training should be provided.	☒ Flood ☐ Thunderstorm ☒ Extreme Temps ☒ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville		

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium	Acquire potential buyouts of business properties on Main Street that were damaged in 2003 flood *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resilience Report	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☒ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County EMA	FEMA
Medium	Provide security and hostage training *New Strategy	**INCOMPLETE**  Once funding is established this should be an ongoing process.	Human Hazard	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	Local funding
Medium	Complete culvert improvements along SR 201 *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	Public Works INDOT	Local resources IDHS OCRA

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium	Upsize culvert on SR 218 east of Poneto *Identified in 2012 Resilience Report	**IN PROGRESS**  The restructuring of this culvert is in progress.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☒ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	Public Works	Local resources IDHS OCRA
Medium	Develop emergency response plan for ethanol plant *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. This should be an ongoing process as structures and conditions change.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☒ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☒ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County EMA	Local resources

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Medium	Conduct a study to determine how much property is above flood elevation and possibly relocate homes in Stoney Creek Mobile Home Park. In 2013, 25 manufactured homes were affected by flooding. *New Strategy	**PENDING**  eFARA submitted to get the official BFEs and determine feasibility of project.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☒ Zanesville		
Low	Mitigate frequent flooding in area near Keystone (old 318 and 200W) with improved culvert or detention basin *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report. This is considered a low priority as the flooding does not have a significant impact on the population.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☒ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☒ Hazmat	☒ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☐ Vera Cruz ☐ Zanesville	County EMA Public Works	FEMA

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Low	LEPC Chairman will attend 16-hour Earthquake disaster training *Identified in 2007 MHMP	**INCOMPLETE**  No update since 2007. Additional disaster training may be appropriate.	☐ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☒ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	LEPC	
Low	Propose a water use ordinance to prioritize or control water usage during drought conditions, particularly for emergency situations like fire fighting *Identified in 2007 MHMP	**INCOMPLETE**  No update since 2007. Proposed statewide ordinances on water usage may dictate the future of this strategy.	☐ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☒ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☒ Wells County ☒ Bluffton ☒ Markle ☒ Ossian ☒ Poneto ☒ Uniondale ☒ Vera Cruz ☒ Zanesville	County EMA	

Priority	Mitigation Action	Status	Hazard	Community	Collaborator(s)	Funder(s)
Low	Relocate Town Hall out of floodplain *Identified in 2012 Resilience Report	**INCOMPLETE**  No update since 2012 Resiliency Report.	☒ Flood ☐ Thunderstorm ☐ Extreme Temps ☐ Winter Storm ☐ Tornado ☐ Fire ☐ Drought ☐ Earthquake ☐ Dam/Levee ☐ Hazmat	☐ Wells County ☐ Bluffton ☐ Markle ☐ Ossian ☐ Poneto ☐ Uniondale ☒ Vera Cruz ☐ Zanesville	Community Development Building Code Department	FEMA

Section 7 Plan Maintenance

7.1 Monitoring, Evaluating, and Updating the Plan

Relevant data, information, maps, and tables developed for this local mitigation plan will be integrated as appropriate into other planning efforts to include zoning, floodplain management, and land use planning. Many of the planning team members, representing the county as well as participating jurisdictions, will integrate these data as part of their roles as floodplain enforcers, zoning officers, and community administrators.

Throughout the five-year planning cycle, Wells County Emergency Management Agency and the MHMP planning committee will monitor, evaluate, and update the plan on an annual basis.

Additionally, a meeting will be held during June of 2018 to begin planning for the next five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

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

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

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

7.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts since many of the mitigation projects identified as part of this planning process are ongoing. Wells County and its incorporated jurisdictions will update the zoning plans and ordinances listed in the 2013 Zoning and Floodplain Management Ordinance as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

7.3 Continued Public Involvement

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

APPENDICES

Appendix A: Meetings

Appendix B: Newspaper Articles and Public Meeting Announcement

Appendix C: List and Locations of Wells County Facilities

Appendix D: Calculated Priority Risk Index

Appendix E: Historical Disasters Photographs

Appendix F: Mitigation Photographs

Appendix G: Adopting Resolutions

Appendix A
Meetings

Meeting #1 Invitation

Date: Monday, September 22, 2014

To Whom It May Concern:

On behalf of the Wells County Area Plan Commission, Wells County Surveyors Office and Wells County Emergency Management Agency we are cordially inviting you to attend the initial community meeting regarding the creation of a new Multi Hazard Mitigation Plan (MHMP), for our community, as a member of the planning committee. The meeting will be on **Tuesday, September 30, 2014 @ 10:00 am.** The meeting will be held at the Wells County Government Annex Building (223 W. Washington St. Bluffton, IN 46714) in the lower level conference room 105. The meeting should last around an hour. Your input and attendance are paramount to the success of this plan and to the future resilience of our community.

Sincerely,

Michael W. Lautzenheiser, Jr., AICP
Wells County, Indiana
APC Director / GIS Manager

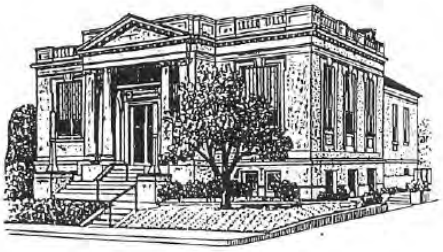
SAVE THE DATE AND HOPE TO SEE YOU ON TUESDAY, SEPTEMBER 30, 2014 @ 10:00 AM.!

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

WELLS COUNTY AREA PLAN COMMISSION
WELLS CARNEGIE GOVERNMENT ANNEX
223 W. Washington St.
Bluffton, Indiana 46714-1955
Room 211 PHONE - 824-6407



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Sincerely,

Michael W. Lautzenheiser, Jr., AICP
Wells County, Indiana
APC Director / GIS Manager

Meeting #1 Sign-In Sheet

WELLS COUNTY MHMP MEETING #1, SEPTEMBER 30, 2014

NAME	TITLE	COMMUNITY	HOURS INVESTED (Include 1.5 hours for this meeting)
Jarrod Hahn	Wells County Surveyor	Wells County	
Rick Dalsen	District 3 Coordinator	IDHS	
Mike Lautzenheiser	Wells Co. APC/EMS	Wells County	
Diana Collins	Deputy Surveyor	Wells County	
Christopher M. Broderick	Fire Chief, Bluffton FD	City of Bluffton	
James Van Winkle	Wells Co. Council/EMA	Wells County	
Rick Plepenbrink	Wells County EMS	Wells County	
Wayne Grove	Wells Co EMA Director	Wells County	
Rick Velasquez	Wells Co EMA D.D.	Wells County	
Roy Johnson	County attorney	Wells Co	
Blake Gerber	Co. Commissioner	Wells Co.	
Nathan Huss	Police Chief	Wells Co.	

Meeting #1 Agenda

The Polis Center
We bring things into perspective

Wells County Five Year MHMP Update
Meeting 1 Agenda
September 30, 2014, 10:00AM

Goal

Introduce the county personnel to the upcoming Pre-Disaster Mitigation (PDM) five-year plan update process.

Venue

EMA Office (Wells County)

Participants

Wells County Planning Team Members

Agenda Items

- Introductions/Overview
- Review changes and updates to Wells County critical facilities over last 5 years
  - Critical Facilities Map
- Review historical hazards over last 5 years
  - Hazard Map
- Compare hazard priorities 2007 vs 2014
- Risk calculation
- Discuss Modeling scenarios
- Hand out Mitigation original plan mitigation strategies
  - List and map of buyouts or mitigated structures
- Discuss public participation
- Meeting #2 date, location, requirements and homework

Meeting #1 Minutes

Wells County Multi-Hazard Mitigation Plan
Meeting 1

September 30, 2014

Wells County Government Annex
Conference Room
223 W Washington St
Bluffton, IN 46714

See Attached Sign-In Sheet

Agenda:

1. Introduction/Overview
2. Review/Prioritize Hazards
3. Risk Calculation
4. Determine Modeling Scenarios
5. Meeting #2 and Public participation

Meeting:

1. John Buechler called the meeting to order at 10:00 am. He presented a slideshow that discussed the purpose of the Multi-Hazard Mitigation Plan, and the process and schedule. He also discussed the importance of matching funds/time by those who participate on the planning team.

2. The planning team reviewed the hazard rankings of the previous plan. The group was presented with a graphic showing each hazards by its Probability and Impact. The group consensus for each hazard within each community was reviewed.

3. A plot of the critical facilities and past hazards was presented to the group for review and comment. The group determined that Polis should model a tornado that traveled northeasterly from the gas peak generating facility in Section 17 of Chester Township, through the Bluffton Industrial park, through downtown Bluffton, and finishing on the northeast side of Bluffton and a hazardous chemical spill at the intersection of 850 N and the Norfolk and Sothern Railroad on the southwest side of Ossian. Polis said they would also model earthquake and flooding.

4. A worksheet with past mitigation strategies and a list of the County critical facilities was distributed to team members for review prior to meeting 2.

5. Meeting # 2 will be Tuesday, January 6, 2015 at 9:00 am. This will be a public meeting.

Meeting #2 Sign-In Sheet

WELLS COUNTY MHMP MEETING #2, JANUARY 6, 2015

NAME	TITLE	COMMUNITY	HOURS INVESTED (Include 1.5 hours for this meeting)
Rob Cleveland	Director, Community Affairs	Indiana Michigan Power	1.5
CHUCK KING	WELLS COUNTY COUNCIL		
Bill Horan	Purdue Extension Educator	Wells	1.5
Jarrod Hahn	Wells County Surveyor	Wells Co.	1.5
Rod Renkenberger	Exec. Dir. MRBC	MRBC	2.0
Toby Steffen	Hell Co Hwy Dept.	Wells Co.	1.5
Roy D. SCHOEFF	CLERK-TREASURER	PONETO	1.0
Blake Gerber	Commissioner	2nd LT 3	
Rick Dolsen	DISTRICT 3 IDNS COORDINATOR	IDNS	3.0
WAYNE GROVE	EMA DIRECTOR	Wells Co	3.0
Michael Lautzenheiser	WELLS Co: APC/GIS Director	WELLS Co.	5
Diana Collins	Wells Co./Surveyor office	Wells Co.	3.0
Rick Velasquez	WellsCounty Deputy Dir.	Wells	3.0
Monte Fisher	Sheriff	Wells	1.5
Rick Diepenbrink	Ems Director	Wells	2.0

NAME	TITLE	COMMUNITY	HOURS INVESTED (Include 1.5 hours for this meeting)
NATHAN HUSS	CHIEF OF POLICE	BLUFFTON PD	1.5
Roy Johnson	Wells County Attorney	Wells Co	3.0

Meeting #2 Agenda

The Polis Center

Wells County, Indiana
Multi-Hazard Mitigation Plan Update
Meeting #2

January 6, 2015
9:00 a.m.

I. Welcome and introductions

II. Overview of planning process and status

III. Review risk assessment and plan draft

IV. Evaluate mitigation strategies since 2007

V. Brainstorm new strategies

VI. Discuss next steps

VII. Q&A

Meeting #2 Minutes

Wells County Multi-Hazard Mitigation Plan
Meeting 2
January 6, 2014

Wells County Government Annex Building
223 W. Washington St.
Bluffton, IN 46714

Agenda:

1. Introductions
2. Project overview for new attendees
3. Review risk assessment document
4. Review and discuss mitigation strategies
5. Public participation
6. Discuss final steps/requirements

Dave Coats of the Polis Center called the meeting to order at 9AM and presented the agenda. He reviewed the history purpose and process of hazard mitigation. The planning team reviewed the hazard priorities that were previously determined at meeting one. Participants were given the opportunity to modify these risks.

Participants were then provided with a copy of the 2007 mitigation strategies. These strategies were reviewed and updated. The team then discussed any new mitigation strategies. These action items be updated and will become a significant component of the 2015 plan and returned to the Wells County hazard mitigation planning team for final edits.

Participants were also provided with a copy of the 2015 Wells County MHMP draft and asked to review the document in detail and provide Polis with any edits, updates or changes.

Once Polis completes the plan update, the final PDM meeting will be scheduled by Wells County. At this time any final edits will be discussed and the plan will be returned to Polis for submission to FEMA.

Meeting #3 Public Meeting Announcement

Multi-Hazard Mitigation Plan Public Meeting Announcement

The Wells County Hazard Mitigation Steering Committee will host a public information and strategy planning session at **6:00 p.m. on Wednesday-April 1, 2015** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

Over the last several months, a planning committee consisting of community members has worked with The Polis Center at Indiana University-Purdue University Indianapolis (IUPUI) to develop a Multi-Hazard Mitigation Plan for Wells County. Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

The steering committee is interested in receiving public input on the plan. You may view the Multi-Hazard Mitigation Plan on the Wells County, City of Bluffton, Town of Ossian, Wells County Voice Web Sites, or view a copy at the Wells County Public Library. Anyone who has questions or would like to provide input should contact Michael Lautzenheiser Area Plan Director and Wells County Flood Plan Manager at 260-824-6407, Jarrod Hahn, Wells County Surveyor at 260-824-6414, Wells County Emergency Management Director, Wayne Grove at 260-824-6433

Meeting #3 Minutes

Wells County Multi-Hazard Mitigation Plan
Public Meeting 3

April 1, 2015 at 6:00 P.M.
Wells County Government Annex Building
223 W. Washington St.
Bluffton, IN 46714
Agenda:

1. New introductions
2. Overview of draft plan and recent updates
3. Review strategies and update status
4. Discuss new strategies
5. Address public questions and concerns

John Buechler of the Polis Center called the meeting to order at 6 P.M. and presented the agenda. He reviewed the history purpose and process of hazard mitigation. The planning team highlighted on the hazard priorities that were previously determined in meeting one and two.

Participants and Landowners were then provided with a copy of the 2015 updated mitigation plan. John Buechler and Rod Renkenberger answered concerns and questions as discussions were made. Rod spoke of flood mitigation, disaster relieve, funding projects in MHMP. Rod spoke of Wells County joining the Community Rating System for discount rate on flood insurance.

Participants and Landowners were also provided with a copy of the 2015 Wells County MHMP draft and were given two weeks to review the document in detail and provide Polis with any edits, updates or changes. John Buechler will provide a student hazard questioner handout to James Buckstein from the American Red Cross to send to 3 area school corporations for students.

Once Polis completes the plan final update, the final PDM meeting will be scheduled by Wells County. At this time any final edits will be discussed and the plan will be returned to Polis for submission to FEMA.

Meeting #3 Sign-In Sheet

WELLS COUNTY MHMP MEETING #3, PUBLIC INPUT MEETING APRIL 1, 2015 AT 6:00 P.M.

NAME	TITLE OR ADDRESS	COMMUNITY	HOURS INVESTED
Steve Wagner	Ponteto IN	Ponteto	Safety Offcir SWHS
Rick Villarreal			
Chris Broderick	Bluffton FD	Fire Chief	
Michael Lautzenheiser	Wells Co APC/GIS	Wells Co.	
Jarrod Hahn	Wells Co Surveyor	Wells Co.	
Rod Benkenberger	Exec. Dir. MRBC	Wells Co.	
Dave Schultz	News Banner reporter	Bluffton	
Blake Geiter		Bl Wells Co.	
Becki Faunce	American Red Cross		

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Thursday, April 02, 2015 1:34 PM
To: 'rfrazee@co.jay.in.us'; 'blackfordema@blackfordema.org'; 'lindsie.goss@huntington.in.us'; 'jaugust@co.adams.in.us'; 'bbender@grantcounty.net'; 'brad.witte@allencounty.us'
Subject: Wells Co MHMP Update
Attachments: Wells_draft_Committee Updates 03.16.15.pdf

Hello,

Wells County is updating their 2007 Multi-Hazard Mitigation Plan which the steering committee has been holding meetings and now just had our public meeting last night to get input.

I am sending our MHMP to surrounding county EMA's as recommended by the Polis Center at IUPUI who is helping us update our plan.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
102W Market, Suite 102
Bluffton, IN 46714
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From: Ralph Frazee <rfrazee@co.jay.in.us>
Sent: Thursday, April 02, 2015 2:54 PM
To: Diana Collins
Subject: RE: Wells Co MHMP Update

I read through your plan and feel that you pretty well covered for most of the hazard plans except for the newest FEMA requirement for climate change forecasting, see my cut and paste below. At least address the issue and be ahead of the FEMA mandate to the states as it will eventually trickle down to each of us as well.

Now, the Federal Emergency Management Agency is issuing states an ultimatum: Start preparing for the effects of climate change, or watch those grant dollars disappear.
FEMA officials announced earlier this year they would award disaster mitigation grants only to states whose hazard mitigation plans address climate change. Now, emergency management officials are trying to determine how that will affect the state's ability to prepare for disasters.

Ralph Frazee
Director
Jay County Emergency Management Agency
224 W. Water Street
Portland, IN 47371
260-726-6909
rfrazee@co.jay.in.us
In teaching others, we teach ourselves. Proverb

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Tuesday, March 31, 2015 10:40 AM
To: 'Tim Ehlerding'; 'Dan Baumgardner'; 'Finley Lane'; 'Jerome Markley'; 'Jim Berger'; 'John Schuhmacher'; 'Keith Masterson'; 'Mike Morrissey'; 'Richard Kolkman'; 'Roy Schoeff'; 'Tim Rohr (taberohr@frontier.com)'
Subject: Public Multi-Hazard Mitigation Planning Mtg

Importance: High

Good Morning to All,

This is just a friendly reminder of the public Multi-Hazard Mitigation Planning meeting tomorrow **Wednesday-April 1, 2015** at **6:00 p.m.**

The Multi-Hazard Mitigation Planning (MHMP) team will meeting for our 3rd and final (I think) meeting to receive Public input. This meeting should only take 1 hour maybe a little longer depending on the public's input. The Polis Center will once again be presenting the meeting. The location is at the Wells County Government Annex Building (223 W. Washington St. Bluffton, IN 46714) in the lower level conference room 105.

We still need everyone's participation for the Good of Wells County.

If you have any questions, please feel free to call and thank you very much.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From:	Diana Collins <surveyor@wellscounty.org>
Sent:	Tuesday, March 17, 2015 9:20 AM
To:	tdunmoyerwcc@gmail.com; Kevin Woodward (kwoodward1052@gmail.com); Blake Gerber (zero@adamswells.com); 'Roy R Johnson'; 'Jim Oswalt'; 'Jim VanWinkle'; 'Mike Mossburg'; 'Todd Mahnensmith'; 'Vicki Andrews'; 'Blake Poindexter'; 'Monte Fisher'; 'king57@news-banner.com'; 'cking@adamswells.com'; 'Shuggins@pretzels-inc.com'; 'Beth Davis'
Cc:	ema@wellscounty.org; Ed Herman (highway@wellscounty.org); tsteffen@bfsengr.com; 'Roger Sherer'; 'horan@purdue.edu'; 'steven.kane@aes.com'; 'Tim Ehlerding'; 'Dan Baumgardner'; 'Finley Lane'; 'Jerome Markley'; 'Jim Berger'; 'John Schuhmacher'; 'Keith Masterson'; 'Mike Morrissey'; 'Richard Kolkman'; 'Roy Schoeff'; 'Tim Rohr (taberohr@frontier.com)'
Subject:	Wells County MHMP Public Meeting
Attachments:	Wells_draft_Committee Updates 03.16.15.pdf; MHMP Public Mtg Announcement 2015.pdf

Hello MHMP Steering Committee Members,

I just received the (attached) updated Multi-Hazard Mitigation Plan back and the Wells County Hazard Mitigation Steering Committee will host a public information and (attached) strategy planning session scheduled for **Wednesday- April 1, 2015** at **6:00 p.m.** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

The public will be able to view the plan on the Wells County, City of Bluffton and Town of Ossian web sites, and a copy will be at the Wells County Public Library for viewing. If anyone has another web site or location for a copy to be at please let me know. Polis Center will be attending the meeting on April 1st.

Please add **Wednesday- April 1, 2015** at **6:00 p.m.** to your calendar and Thank you again for your participation and attendance for the Good of Wells County.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Tuesday, March 17, 2015 4:21 PM
To: 'emarshall@wellscolibrary.org'
Subject: Wells Co Multi-Hazard Mitigation Plan Public Mtg
Attachments: MHMP Public Mtg Announcement 2015.pdf; Wells_draft_Committee Updates 03.16.15.pdf

Hello Emily,

I was directed to send you this information on the above attachments for the Updated Multi-Hazard Mitigation Plan, and the MHMP public meeting announcement to be place on your web-sites for the public to view.

The information and strategy planning session at **6:00 p.m. on Wednesday-April 1, 2015** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

If you have any questions, please feel free to call and thank you very much.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Wednesday, April 01, 2015 10:30 AM
To: 'lindsie.goss@huntington.in.us' Huntington Co EMA
Subject: Wells Co MHMP Update Meeting Tonight
Attachments: MHMP Public Mtg Announcement 2015.pdf

Importance: High

Hello,

This is to invite to attend The Wells County Hazard Mitigation Planning Steering Committee who will host a public information and strategy planning session at **tonight Wednesday-April 1, 2015** at **6:00 p.m.** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
102W Market, Suite 102
Bluffton, IN 46714
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Wednesday, April 01, 2015 10:12 AM
To: 'jaugust@co.adams.in.us'
Subject: Wells Co MHMP Update Meeting Tonight
Attachments: MHMP Public Mtg Announcement 2015.pdf

Importance: High

Adams Co. EMA

Hello,

This is to invite to attend The Wells County Hazard Mitigation Planning Steering Committee who will host a public information and strategy planning session at **tonight Wednesday-April 1, 2015** at **6:00 p.m.** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
102W Market, Suite 102
Bluffton, IN 46714
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

1

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Tuesday, March 17, 2015 9:34 AM
To: 'Brenda Jackson'; 'sales@wellscountyvoice.com'; 'Luann Martin'; Roger Richardson (roger.richardson@wellscounty.org)
Subject: Wells Co MHMP and Public Announcement Mtg April 1st
Attachments: MHMP Public Mtg Announcement 2015.pdf; Wells_draft_Committee Updates 03.16.15.pdf

Good Morning,

Here are the attachments for the Updated Multi-Hazard Mitigation Plan, and the MHMP public meeting announcement to be place on your web-sites for the public to view.

The information and strategy planning session at **6:00 p.m. on Wednesday-April 1, 2015** in the Wells Carnegie Government Annex, 223W. Washington St., Multi-Purpose Room 105, (Lower Level), Bluffton, Indiana.

If you have any questions, please feel free to call and thank you very much.

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Thursday, April 02, 2015 1:34 PM
To: 'rfrazee@co.jay.in.us'; 'blackfordema@blackfordema.org'; 'lindsie.goss@huntington.in.us'; 'jaugust@co.adams.in.us'; 'bbender@grantcounty.net'; 'brad.witte@allencounty.us'
Subject: Wells Co MHMP Update
Attachments: Wells_draft_Committee Updates 03.16.15.pdf

Allen Grant Adams Jay Blackford Huntington EMA

Hello,

Wells County is updating their 2007 Multi-Hazard Mitigation Plan which the steering committee has been holding meetings and now just had our public meeting last night to get input.

I am sending our MHMP to surrounding county EMA's as recommended by the Polis Center at IUPUI who is helping us update our plan.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
102W Market, Suite 102
Bluffton, IN 46714
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

1

Diana Collins

From: Goss, Lindsie <Lindsie.Goss@huntington.in.us>
Sent: Saturday, April 04, 2015 10:37 AM
To: Diana Collins
Subject: Re: Wells Co MHMP Update

EMA Statement
Huntington Co

Diana,

My apologies for the late response -- your email was hijacked by my spam filter and I just now saw both emails. I'm happy to look over your plan, however I have a few questions:

1. What exactly should my concern be for this in terms of your focal point of change?

2. Are the changes something reflected by HSPD 8 or the National Response Framework?

3. Is there something specific you are looking to other counties for that would help you?

Cordially,

Lindsie Goss
Director for Huntington County
Emergency Management Agency
332 East State St.
Huntington, IN 46750
Office: 260-358-4870
Fax: 260-358-4871

Sent from my iPhone 6+; please forgive any typos.

On Apr 4, 2015, at 10:27 AM, Diana Collins <surveyor@wellscounty.org> wrote:

> Hello,
>
> Wells County is updating their 2007 Multi-Hazard Mitigation Plan which the steering committee has been holding meetings and now just had our public meeting last night to get input.
>
> I am sending our MHMP to surrounding county EMA's as recommended by the Polis Center at IUPUI who is helping us update our plan.
>
> Thank You,
>
> *Diana*
>
> Diana Collins, Deputy Surveyor
> Wells County Surveyor's Office
> 102W Market, Suite 102
> Bluffton, IN 46714

1

EMAIL RECIPIENTS

News Papers: jessicaw@news-banner.com; newsroom@news-banner.com; 'king57@news-banner.com''daves@news-banner.com''rshawgo@jg.net'; 'lisagreen@jg.net'

WEB SITES: 'Brenda Jackson' <mayorsoffice@ci.bluffton.in.us>; 'sales@wellscountyvoice.com'; 'Luann Martin' <TownManager@ossianin.com>; Roger Richardson (roger.richardson@wellscounty.org) 'emarshall@wellscolibrary.org

REDCROSS: 'Becki.Faunce@redcross.org';'Jeri.Elliott@redcross.org'Katherine.MacAulay@redcross.org'; jbeckmill@aol.com 'DAVID HOCKLEY' ddhockley@yahoo.com

BUSINESSES: 'JTople@buckhorninc.com'; 'Todd Johnson' <TJohnson@alexinllc.com>; 'Brett Miller' <brett@mlswebsite.us>; 'Tim Weist' <tim@almcosteel.com>; 'Jacob Duke, GPRE Inc'); 'Roy R Johnson' <royrjohnson@adamswells.com>; <Jacob.Duke@gpreinc.com>; 'Stoffel, Jim' StoffelJ@helenachemical.com'Shuggins@pretzels-inc.com'; 'bfenstermaker@atc.in.gov'; 'tehlerding@wellsedc.com'; 'rdolsen@dhs.in.gov';

EMA SURROUNDING COUNTIES: 'rfrazee@co.jay.in.us'; 'blackfordema@blackfordema.org'; 'lindsie.goss@huntington.in.us'; 'jaugust@co.adams.in.us'; 'bbender@grantcounty.net'; 'brad.witte@allencounty.us'

TOWNS/COMMUNITY REPRESENTATIVES: Mayor Ted Ellis <mayor@ci.bluffton.in.us> (mayor@ci.bluffton.in.us); 'Brenda Jackson' <mayorsoffice@ci.bluffton.in.us>; 'fdchief@ci.bluffton.in.us'; 'pdchief@ci.bluffton.in.us'; 'rick@wellscountyems.org'; 'TownManager@ossianin.com'; 'BPursley@ossianin.com'; 'JBarkley@ossianin.com'; 'Tim Ehlerding' <tehlerding@wellsedc.com>; 'Dan Baumgardner' <franb1@frontier.com>; 'Finley Lane' <ponetofd@citznet.com>; 'Jerome Markley' <jmarkley@citznet.com>; 'Jim Berger' <jrberger@att.net>; 'John Schuhmacher' <jandeschuhmacher@gmail.com>; 'Keith Masterson' <toolman5764@onlyinternet.net>; 'Mike Morrissey' <morrissey@adamswells.com>; 'Richard Kolkman' <ddkolkman@yahoo.com>; 'Roy Schoeff' <tops@citznet.com>; 'Brenda Jackson' <mayorsoffice@ci.bluffton.in.us>; 'sales@wellscountyvoice.com';

ELECTRIC COMPANY/COMUNICATIONS: 'Tim Rohr (taberohr@frontier.com)' tabcrohr@frontier.com'dlrigney@comcast.net'; 'utilities1@ci.bluffton.in.us'; 'dolsen@dhs.in.gov'; 'Nick Parker' <Nick@unitedremc.com>; 'kmsabrosky@aep.com'; 'dblankenbeker@nisource.com'; 'rdolsen@dhs.in.gov';

OFFICIALS/APPOINTMENTS: tdunmoyerwcc@gmail.com; Kevin Woodward (kwoodward1052@gmail.com); Blake Gerber (zero@adamswells.com'Jim Oswalt' <jimoswalt@oswaltrealty.com>; 'Jim VanWinkle' <jbvanwin@adamswells.com>; 'Mike Mossburg' <mike@techservicespro.com>; 'Todd Mahnensmith' <kmasphalt@frontier.com>; 'Vicki Andrews' <VAndrews@swell.k12.in.us>; 'Blake Poindexter' <btpwcccd@adamswells.com>; 'Monte Fisher' <sheriff@wellscountysheriff.com>; 'cking@adamswells.com'; 'Beth Davis' Auditor@wellscounty.org Ed Herman (highway@wellscounty.org); tsteffen@bfsengr.com; 'Roger Sherer' <rsherer@purdue.edu>; 'horan@purdue.edu'; 'steven.kane@aes.com'; 'Tim Ehlerding' <tehlerding@wellsedc.com>; ema@wellscounty.org; rvelasquez@wellscounty.org Michael Lautzenheiser (GIS@wellscounty.org); Diana Collins <surveyor@wellscounty.org>Jarrod M Hahn <surveyor@wellscounty.org>

POLIS/MRBC: 'jobuechl@iupui.edu'; 'decoats@iupui.edu'; 'kmickey@iupui.edu'; 'Christine D' <schmitzc@iupui.edu>; Buechler, John J (jobuechl@iupui.edu); 'Rodney Renkenberger, PLS, CFM' rodr@mrbc.org

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Tuesday, March 31, 2015 10:40 AM
To: 'Tim Ehlerding'; 'Dan Baumgardner'; 'Finley Lane'; 'Jerome Markley'; 'Jim Berger'; 'John Schuhmacher'; 'Keith Masterson'; 'Mike Morrissey'; 'Richard Kolkman'; 'Roy Schoeff'; 'Tim Rohr (taberohr@frontier.com)'
Subject: Public Multi-Hazard Mitigation Planning Mtg towns
Importance: High

Good Morning to All,

This is just a friendly reminder of the public Multi-Hazard Mitigation Planning meeting tomorrow **Wednesday-April 1, 2015** at **6:00 p.m.**

The Multi-Hazard Mitigation Planning (MHMP) team will meeting for our 3rd and final (I think) meeting to receive Public input. This meeting should only take 1 hour maybe a little longer depending on the public's input. The Polis Center will once again be presenting the meeting. The location is at the Wells County Government Annex Building (223 W. Washington St. Bluffton, IN 46714) in the lower level conference room 105.

We still need everyone's participation for the Good of Wells County.

If you have any questions, please feel free to call and thank you very much.

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

1

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Monday, December 22, 2014 9:41 AM
To: Mayor Ted Ellis <mayor@ci.bluffton.in.us> (mayor@ci.bluffton.in.us); 'Brenda Jackson'; 'fdchief@ci.bluffton.in.us'; 'pdchief@ci.bluffton.in.us'; 'TownManager@ossianin.com'; 'BPursley@ossianin.com'; 'JBarkley@ossianin.com'; 'dlrigney@comcast.net'; 'bfenstermaker@atc.in.gov'; 'rick@wellscountyems.org'; 'tehlerding@wellsedc.com'; 'rdolsen@dhs.in.gov'; 'jobuechl@iupui.edu'; 'decoats@iupui.edu'; 'kmickey@iupui.edu'; 'Christine D'; Buechler, John J (jobuechl@iupui.edu); Michael Lautzenheiser (GIS@wellscounty.org); 'Rodney Renkenberger, PLS, CFM'
Cc: 'utilities1@ci.bluffton.in.us'; 'dolsen@dhs.in.gov'; 'Nick Parker'; 'Katherine.MacAulay@redcross.org'; 'Jeri.Elliott@redcross.org'; 'kmsabrosky@aep.com'; 'dblankenbeker@nisource.com'; 'rdolsen@dhs.in.gov'
Subject: Multi-Hazard Mitigation Planning Meeting#2
Attachments: Meeting 2 Agenda.docx; Wells Co MHMP PlanTeam Mtg Minutes (MTG 1).pdf

Good Morning to All,

The Multi-Hazard Mitigation Planning (MHMP)team will meet for our 2nd meeting on **January 6, 2015 at 9:00 a.m.** with the Polis Center at the Wells County Government Annex Building (223 W. Washington St. Bluffton, IN 46714) in the lower level conference room 105. This meeting we will review our risk assessment and discuss our old and new mitigation strategies to update the Multi-Hazard Mitigation Plan for Wells County . NOTE: The public meeting will be at our 3rd meeting which the date is yet to be determined.

FYI-On October 1st I sent out an e-mail of a worksheet with Wells Co past mitigation strategies and a list of the County critical facilities was distributed to team members for review prior to meeting 2 on January 6th.

Attached is the Agenda for January 6th, 2015 and Minutes from our last meeting on September 30th.

We need everyone's participation for the Good of Wells County.

Have a Safe and Happy Holidays!!!

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

1

Diana Collins

From: Diana Collins <surveyor@wellscounty.org>
Sent: Monday, September 22, 2014 1:04 PM
To: Mayor Ted Ellis <mayor@ci.bluffton.in.us> (mayor@ci.bluffton.in.us); 'Brenda Jackson'; 'fdchief@ci.bluffton.in.us'; 'pdchief@ci.bluffton.in.us'; 'TownManager@ossianin.com'; 'BPursley@ossianin.com'; 'JBarkley@ossianin.com'; 'dlrigney@comcast.net'; 'bfenstermaker@atc.in.gov'
Cc: 'utilities1@ci.bluffton.in.us'; 'dolsen@dhs.in.gov'; 'Nick Parker'; 'Katherine.MacAulay@redcross.org'; 'Jeri.Elliott@redcross.org'
Subject: Multi Hazard Mitigation Plan-Planning Committee Invite
Attachments: MHMP Letter of Invite .pdf

Date: Monday, September 22, 2014

To Whom it May Concern:

On behalf of the Wells County Area Plan Commission, Wells County Surveyors Office and Wells County Emergency Management Agency we are cordially inviting you to attend the initial community meeting regarding the creation of a new Multi Hazard Mitigation Plan (MHMP), for our community, as a member of the planning committee. The meeting will be on **Tuesday, September 30, 2014 @ 10:00 am.** The meeting will be held at the Wells County Government Annex Building (223 W. Washington St. Bluffton, IN 46714) in the lower level conference room 105. The meeting should last around an hour. Your input and attendance are paramount to the success of this plan and to the future resilience of our community.

Sincerely,

Michael W. Lautzenheiser, Jr., AICP
Wells County, Indiana
APC Director / GIS Manager

SAVE THE DATE AND HOPE TO SEE YOU ON TUESDAY, SEPTEMBER 30, 2014 @ 10:00 AM.!

Thank You,

Diana

Diana Collins, Deputy Surveyor
Wells County Surveyor's Office
Phone: 260-824-6414
Fax: 260-827-0809
E-Mail: surveyor@wellscounty.org

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Appendix B

Newspaper Articles and Announcements

Bluffton Fire Department to hand out Free Smoke Detectors

Chief Broderick, FF Engineer Kurt Beer and FF Engineer Don Craig

Almost 2,500 people die in home fires every year in the United States. The most common cause of fire deaths is smoke inhalation from burning materials. Many of the fires occur at night, during our most vulnerable time, when we are sleeping and most of the deaths occurred in homes that did not have a working smoke alarm (according to the National Fire Protection Agency) Smoke alarms are early detection devices that emit an alert at the first hint of smoke, giving families time to get out safely.

Unfortunately there are many homes in our community that do not have working fire alarms, or the financial means to get one. Bluffton Fire Department Chief, Chris Broderick, recently received a $500 donation from a local organization (wishing to remain anonymous) for the use of fire safety and prevention. Chief Broderick purchased 31 First Alert 10 year Lithium Battery smoke alarms.

Chief Broderick and the Bluffton Fire Department, will be offering these smoke alarms free of charge to families currently without a working smoke alarm and the financial means to purchase one. They will provide 1 fire alarm per household. Residents living in the Harrison & Lancaster Township areas that are in need of a smoke alarm can stop by the Bluffton Fire Department at 204 E. Market Street in Bluffton, Monday thru Friday 8am – 4pm to request an alarm. (while supplies last)

Chief Broderick would also like to remind renters that by law, landlords are required to provide one working fire alarm per rental unit. (see IC 22-11-18 Chapter 18 Smoke Detection Devices Code below)

Chief Broderick states he plans to begin annual fundraisers to raise money for fire safety and education, and wants the public to know that no tax dollars were used in the purchase of these alarms.

Source: http://wellscountyvoice.com/bluffton-fire-department-to-hand-out-free-smoke-detectors-p8954-294.htm

Wells Co. EMS Tornado Training

Wells County EMS, organized a "Tornado training" event, on Sunday evening, at the home of Kevin McNabb on SR 1 North. Tina Crouse, CEO of Wells Co. EMS, Inc., stated that the fire departments from Ossian, Uniondale, Poe and Southwest Fire district participated. Bluffton Fire Department had previous commitments, and couldn't participate.

Tina stated that the purpose of the training was to determine weaknesses and strengths of all the units involved to improve future activity. One weakness that was noticed, involved triage tags that were new this year, and issued by the state of Indiana. It was determined that the basic ones used for over 25 years were much more user friendly, and they would go back to using them.

There were 37 "victims" of the tornado touchdown, including everything from bumps and bruises, broken bones, death, and contamination. The workers had to deal with downed power lines, burning vehicles, debris fields, and multiple injuries all at the same time. The contamination team had to spray down (decontaminate) many victims, and then spray down themselves. Multiple EMS teams transported "victims" to Parkview, Lutheran and Bluffton Regional.

Mrs. Crouse also mentioned that she has been in contact with the EMS director from Joplin, Missouri- St. Johns Medical Center, and has been talking with him on areas to work on, and that has been a great resource for her.

Source: Wells County Voice

The News-Banner
Good Morning!
www.news-banner.com
SATURDAY, APRIL 11, 2015 BLUFFTON, INDIANA · Wells County's Hometown Connection 75¢

April 11, 1965

The Palm Sunday tornado destroyed the Friends Church in Keystone, leaving pews by themselves. Witnesses said members of the congregation sought shelter underneath the pews as the deadly tornado struck.

(Photo taken by Hansjörg Ebell, a foreign exchange student at the time, and provided by Bill Morris)

50 years ago, a tornado killed two people and demolished Keystone

ty before lifting just a few miles west of the start of the tornado that went through Wells County. In pretty much a straight line, a tornado touched down in Ohio's Allen County east of the ending point of the tornado that went through Wells County.

Another string of tornadoes went through northern Indiana. Twisters hit Porter, LaPorte, Starke, Marshall, Elkhart, Lagrange, and Steuben counties in Indiana before crossing the state line north into Michigan.

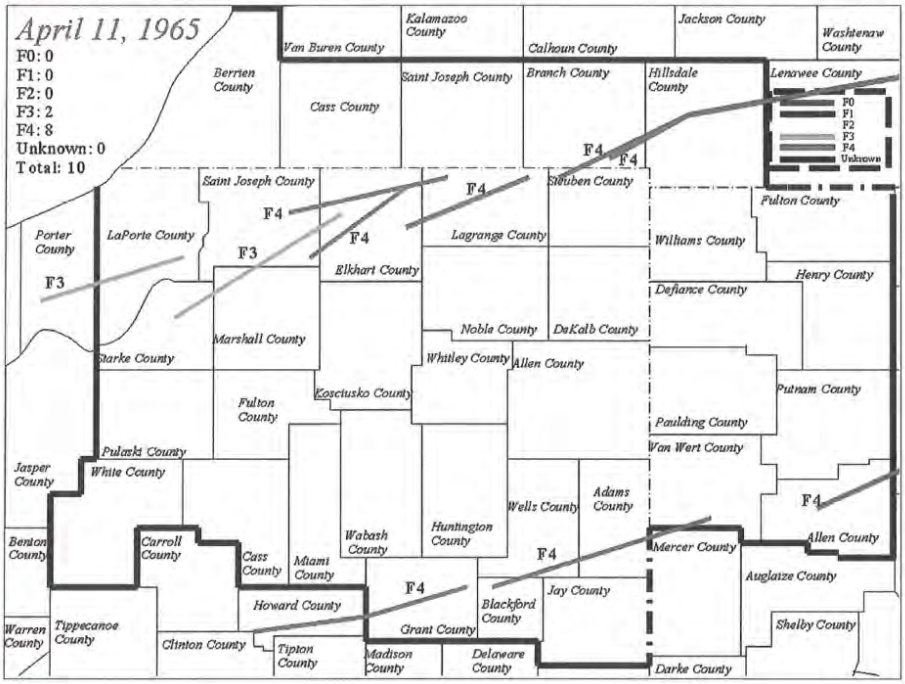
According to the chronology of the events of 50 years ago, the first tornado came down near Tipton, Iowa, and went 91 miles before rising. One person was killed by that twister, but did not die until a month later.

The storm system went to Wisconsin, where three were killed. In Illinois, six died.

The storm's worst fury fell on Indiana. There were 145 deaths in the state, according to the NWS timeline. Two of them struck the town of Dunlap, between Elkhart and Goshen; the second tornado alone caused 36 deaths. There were 25 people killed in the tornado that hit Russiaville, Greentown, southern Kokomo, and Alto; the chronology on the NWS website says 90 percent of the structures in Russiaville were damaged or destroyed. That tornado was the one that appears to have followed the line that took it into Wells County.

The tornado that was the furthest south went from southeast of Crawfordsville to near the Hamilton

Three copies of the Bluffton News-Banner give coverage of the April 11, 1965, tornado.



The above map, provided by the National Weather Service, details the tornadoes that devastated sections of Indiana on April 11, 1965. Running diagonally across the bottom of the map is the path of three twisters, which may have been one funnel cloud that went up and down as it made its way east. The first tornado touched down in eastern Howard County and stayed on the ground through Marion in Grant County. The second one was the one that hit Wells County; it got its start near Roll west of Montpelier in Blackford County and went through southeastern Wells County, across Adams County, and into Mercer and Van Wert counties in Ohio. The third tornado touched down in Allen County, Ohio.

Source: news-banner.com

Smekens: The wind's force even knocked down the tombstones

By GLEN WERLING

Heading through the deep darkness rendered by the 1965 Palm Sunday tornado, Joe Smekens saw something he'll never forget.

As the National Guard troop transport he was on approached Berne, the headlights of the truck shown on the tombstones at MRE Cemetery just west of town.

Most of the tombstones had been blown flat to the ground.

"That struck a fear in me because I thought to myself, 'Oh my gosh, what are we getting into? If that storm was strong enough to blow over tombstones, what else did it do?'"

Smekens' National Guard unit had been called to the Bluffton Armory earlier that evening and had been briefed that a tornado had hit Berne and the troops were being dispatched there to maintain order.

"The first place that I went to was the Poplar Drive-in, which was right next to the bowling alley. It was a cement block building with a U-shaped counter and on the counter everything was still in its place. There were racks with 10-cent potato chips and salt and pepper shakers and silverware and plates and everything was in its place, but there was no roof on the building," said Smekens. "It was like everything was just the way it should be, but minus the roof. I wondered how that could happen. How could the roof be gone and nothing else disturbed?"

The restaurant and the bowling alley were up on Berne's north side and controlling traffic to and from them was not too difficult.

Next door to the restaurant, the bowling alley was mostly swept away, Smekens recalled. "Except for the lanes. And after awhile, pretty much not doing anything it was thought, 'Why not bowl?' We didn't do it all day long but I do recall some guys setting up pins and other guys bowling."

That was another oddity of the tornado, he added. The building was gone but the balls and the pins stayed.

The guard was also sent to Linn Grove after most of the town was extensively damaged by the tornado. On the way into town, another sight that struck Smekens – former managing editor of the News-Banner – was a blue panel truck about 30 feet up in a large tree.

It was still upright, sitting at a slightly cocked angle and did not appear to have much damage beyond sitting high in a tree.

glenw@news-banner.com

Cars were left amid the rubble left behind after a deadly tornado April 11, 1965, struck Keystone. The twister caused two deaths.

Source: news-banner.com

Appendix C

List and Locations of Wells County Facilities

FACILITIES

Essential Facility Name	Facility Type	Location
AWS	Care	Markle
Bi-County Services Inc.	Care	Bluffton
Fresenius Medical Care Wells County	Care	Bluffton
Wells County WIC Program	Care	Bluffton
Bluffton Regional Medical Center	Care	Bluffton
Kindred Nursing And Rehabilitation-Meadowvale	Care	Bluffton
Christian Care Retirement Community	Care	Bluffton
Woodlands At River Terrace Estates	Care	Bluffton
River Terrace Estates Home Health	Care	Bluffton
AWS	Care	Ossian
Markle Health & Rehabilitation	Care	Markle
Ossian Health Care And Rehabilitation Center	Care	Ossian
Indiana Physical Therapy Inc.	Care	Bluffton
Wells County EMA	EOC	Bluffton
Bluffton Fire Department	Fire Station	Bluffton
Ossian Fire Department	Fire Station	Ossian
Uniondale Volunteer Fire Department	Fire Station	Uniondale
Liberty Center Township VFD	Fire Station	Liberty Center
Poneto Volunteer Fire Department	Fire Station	Poneto
Nottingham Township VFD	Fire Station	Petroleum
Chester Township VFD	Fire Station	Poneto
Liberty Center Township VFD New Station	Fire Station	Liberty Center
Ossian City Police Department	Police Station	Ossian
Wells County Sheriff Department	Police Station	Bluffton
Bluffton Police Department	Police Station	Bluffton
Norwell High School	School	Ossian
Norwell Middle School	School	Ossian
Bluffton High School	School	Bluffton
Wesleyan Heritage Academy	School	Bluffton
Kingdom Academy of Bluffton Inc.	School	Bluffton
Covenant Christian School	School	Bluffton
New Life Christian School	School	Bluffton
Bethlehem Lutheran School	School	Ossian
Bluffton-Harrison Elem School	School	Bluffton
Southern Wells Elem School	School	Poneto
Southern Wells Jr-Sr High School	School	Poneto
Ossian Elementary	School	Ossian
Lancaster Central School	School	Bluffton
Bluffton-Harrison Middle School	School	Bluffton

Critical Facility Name	Facility Type	City
Miller	Airport	Bluffton
Grandlienard-Hogg	Airport	Bluffton
Wells County Sheriff's Department	Airport	Bluffton
Mossburg	Airport	Liberty Center
The Lazy K	Airport	Tocsin
Mayer	Airport	Union Dale
K-9 Korner	Airport	Ossian
Skip's Place	Airport	Ossian
Tucker Farms	Airport	Montpelier
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Bluffton
Siren	Communication	Markle
Siren	Communication	Markle
Siren	Communication	Uniondale
Siren	Communication	Craigville
Siren	Communication	Craigville
Siren	Communication	Bluffton
WNUY	Communication	Bluffton
WNUY	Communication	Bluffton
WNUY	Communication	Bluffton
WNUY	Communication	Bluffton
New	Communication	Nottingham
Kunkel Lake Dam	Dam	Ouabache State Park
Decker Lake Dam	Dam	Dale Decker
Moser Lake Dam	Dam	Ossian
Franklin Electric Co. Inc.	Hazmat	Bluffton
Franklin Electric Co. Inc.	Hazmat	Bluffton
Franklin Electric Co. Inc.	Hazmat	Bluffton
Franklin Electric Co. Inc.	Hazmat	Bluffton
Franklin Electric Co. Inc.	Hazmat	Bluffton
Franklin Electric Co. Inc.	Hazmat	Bluffton
Almco Steel Prods. Corp.	Hazmat	Bluffton
Almco Steel Prods. Corp.	Hazmat	Bluffton
Almco Steel Prods. Corp.	Hazmat	Bluffton

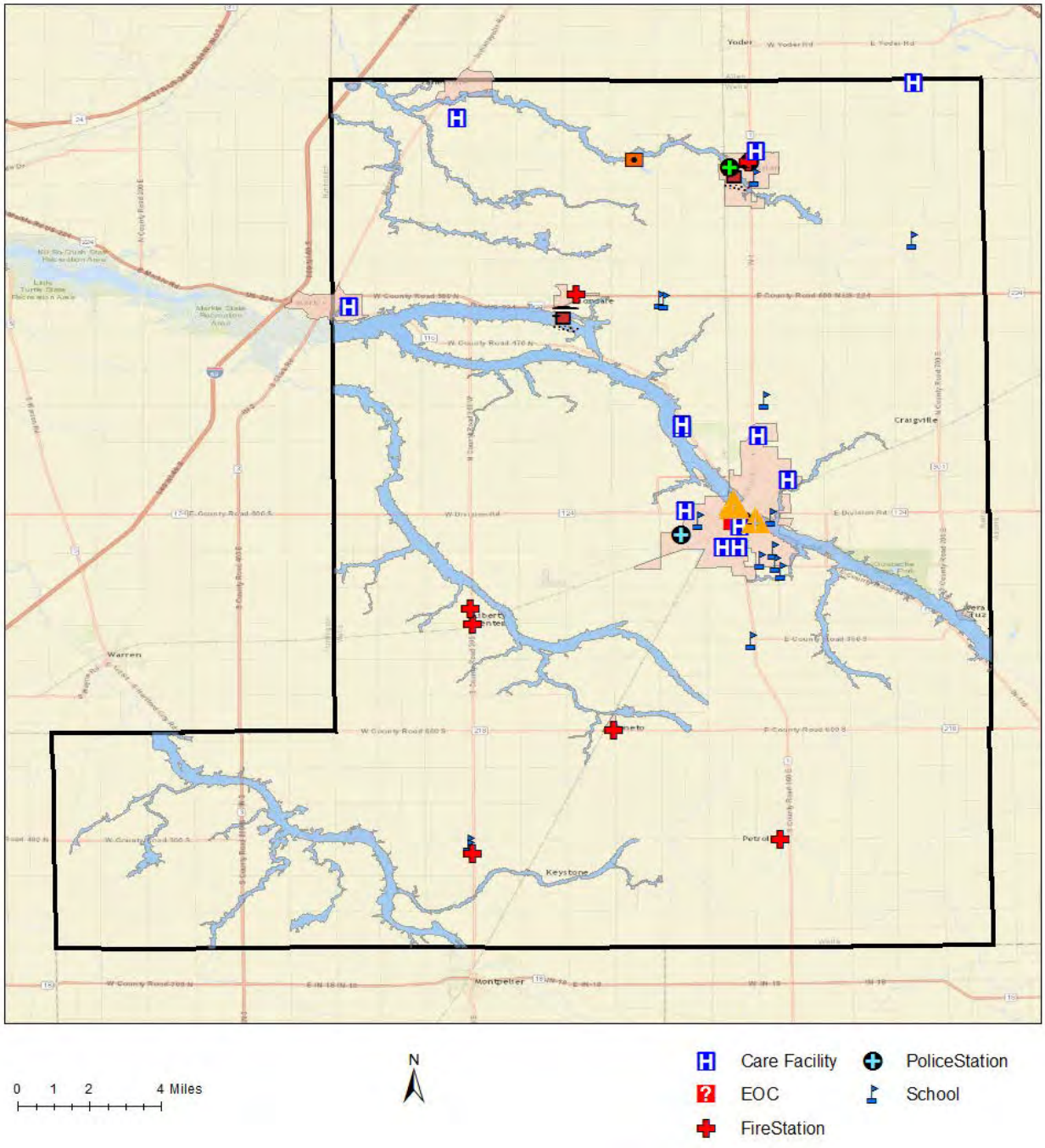
Critical Facility Name	Facility Type	Location
Johnson Controls Inc.	Hazmat	Ossian
Energy Control Inc.	Hazmat	Ossian
Branch - Rebecca Knight	Highway Bridge	
Black Creek-Prairie Brch	Highway Bridge	
I-69	Highway Bridge	
Wabash River	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Miller Ditch	Highway Bridge	
Six Mile Creek	Highway Bridge	
Johns Ditch	Highway Bridge	
Rock Creek	Highway Bridge	
Elm Creek	Highway Bridge	
Six Mile Creek	Highway Bridge	
Markley Ditch	Highway Bridge	
Johns Ditch	Highway Bridge	
Wabash River	Highway Bridge	
Halls Creek	Highway Bridge	
Halls Creek	Highway Bridge	
Halls Creek	Highway Bridge	
Gordon Ditch	Highway Bridge	
Rock Creek	Highway Bridge	
Rock Creek Overflow	Highway Bridge	
Eightmile Creek	Highway Bridge	
Sixmile Creek	Highway Bridge	
Johns Ditch	Highway Bridge	
Rock Creek	Highway Bridge	
Sixmile Creek	Highway Bridge	
Sixmile Creek	Highway Bridge	
Sixmile Creek	Highway Bridge	
Camp Run Ditch	Highway Bridge	
Camp Run Ditch	Highway Bridge	
Threemile Creek	Highway Bridge	
Miller Ditch	Highway Bridge	
Rock Creek	Highway Bridge	
Rock Creek	Highway Bridge	
Threemile Creek	Highway Bridge	
Threemile Creek	Highway Bridge	
Morrison Ditch	Highway Bridge	
Prairie Creek	Highway Bridge	
Owl Creek	Highway Bridge	

Critical Facility Name	Facility Type
Prairie Creek	Highway Bridge
Black Creek	Highway Bridge
Owl Creek	Highway Bridge
Owl Creek	Highway Bridge
Owl Creek	Highway Bridge
Scuffle Creek	Highway Bridge
Scuffle Creek	Highway Bridge
Scuffle Creek	Highway Bridge
Salamonie River	Highway Bridge
Shadle Drain	Highway Bridge
Carnes New Clark Ditch	Highway Bridge
Salamonie River	Highway Bridge
Salamonie River	Highway Bridge
Scuffle Creek	Highway Bridge
Branch Salamonie River	Highway Bridge
Salamonie River	Highway Bridge
Halls Creek	Highway Bridge
Neff Ditch	Highway Bridge
Rock Creek	Highway Bridge
Rock Creek	Highway Bridge
Rock Creek	Highway Bridge
Mossburg Ditch	Highway Bridge
Mossburg Ditch	Highway Bridge
Mossburg Ditch	Highway Bridge
Rock Creek	Highway Bridge
Rock Creek	Highway Bridge
Mossburg Ditch	Highway Bridge
Rock Creek	Highway Bridge
Rock Creek	Highway Bridge
Stites Ditch	Highway Bridge
Rock Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Six Mile Creek	Highway Bridge
Neff Ditch	Highway Bridge
Rock Creek	Highway Bridge
Rock Creek	Highway Bridge

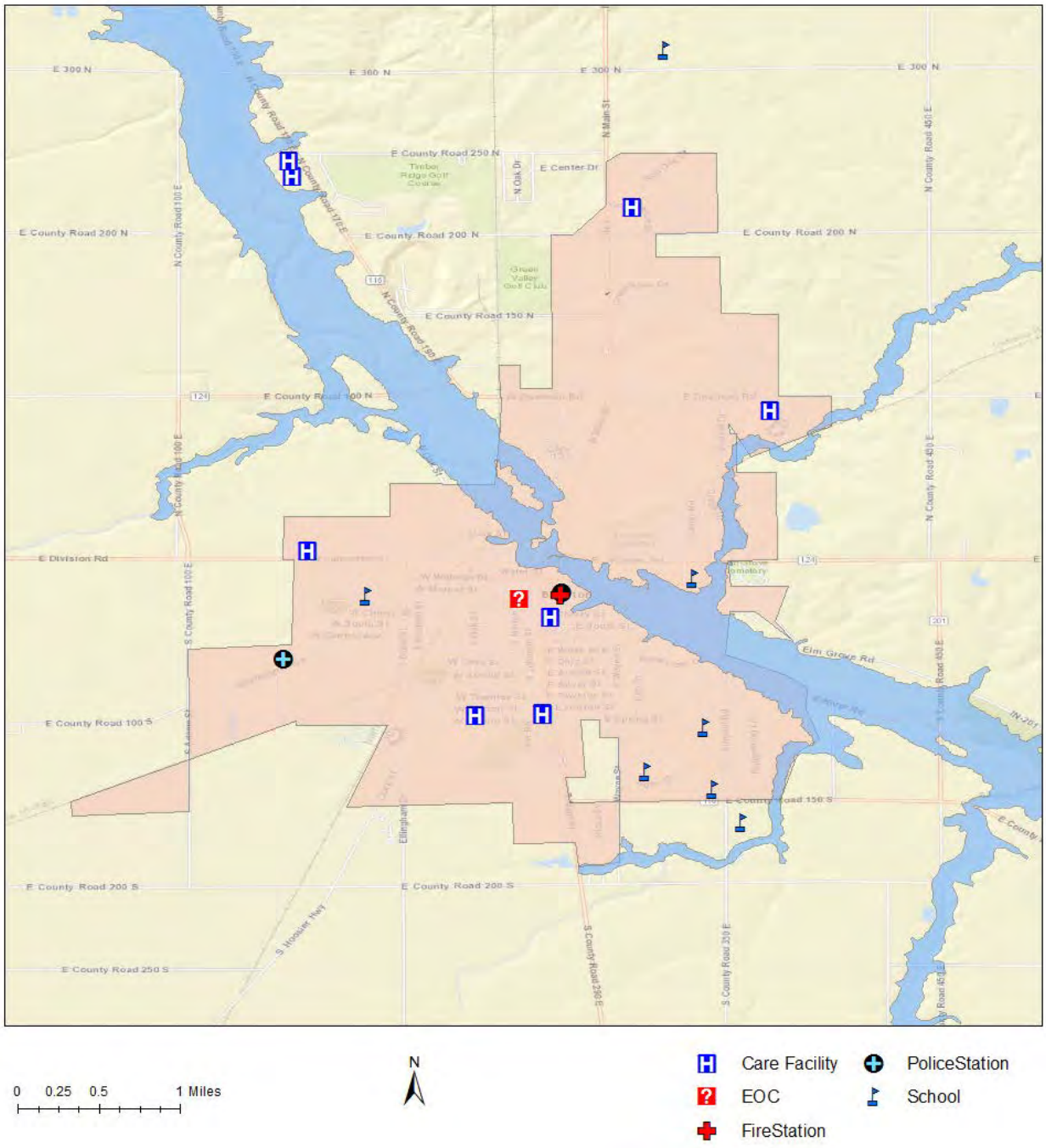
Critical Facility Name	Facility Type
Rock Creek	Highway Bridge
Wabash River	Highway Bridge
Griffin Ditch	Highway Bridge
Griffin Ditch	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Hunter Drain	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile No.2 Ditch	Highway Bridge
Eight Mile Creek	Highway Bridge
Hunter Drain	Highway Bridge
Eight Mile Creek	Highway Bridge
Hunter Drain	Highway Bridge
Maple Creek	Highway Bridge
Flat Creek	Highway Bridge
Flat Creek	Highway Bridge
Big Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Big Creek	Highway Bridge
Flat Creek	Highway Bridge
Big Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Eight Mile Creek	Highway Bridge
Witzgall Ditch	Highway Bridge
Flat Creek	Highway Bridge
Flat Creek	Highway Bridge
Johns Creek	Highway Bridge
Johns Creek	Highway Bridge
Dowty Ditch	Highway Bridge
Dowty Ditch	Highway Bridge
Rock Creek	Highway Bridge
Camp Run Ditch	Highway Bridge
Shoemaker Ditch	Highway Bridge
Owl Creek	Highway Bridge
Markley Ditch	Highway Bridge
Branch Of Flat Creek	Highway Bridge
Branch Of Flat Creek	Highway Bridge

Critical Facility Name	Facility Type	
Eight Mile Creek	Highway Bridge	
Wabash River	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Scuffle Creek	Highway Bridge	
Scuffle Creek	Highway Bridge	
Scuffle Creek	Highway Bridge	
Big Creek	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Scuffle Creek	Highway Bridge	
Stites Ditch	Highway Bridge	
Rock Creek	Highway Bridge	
Griffin Ditch	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Wabash River	Highway Bridge	
Scuffle Creek	Highway Bridge	
Kershner Ditch	Highway Bridge	
Flat Creek	Highway Bridge	
Owl Creek	Highway Bridge	
Big Creek	Highway Bridge	
Harrold Ditch	Highway Bridge	
Wabash River	Highway Bridge	
Carnes New Clark Ditch	Highway Bridge	
Big Creek	Highway Bridge	
Salamonie River	Highway Bridge	
Prairie Creek	Highway Bridge	
Eight Mile Creek	Highway Bridge	
Wabash River	Highway Bridge	
Six Mile Creek	Highway Bridge	
Indiana National Guard Armory	Military	Bluffton
Bluffton Public Water Supply	Potable Water	Bluffton
Ossian Municipal WWTP	Wastewater	Ossian
Uniondale Municipal STP	Wastewater	Uniondale
Poneto Municipal STP	Wastewater	Poneto
Bluffton Municipal STP	Wastewater	Bluffton

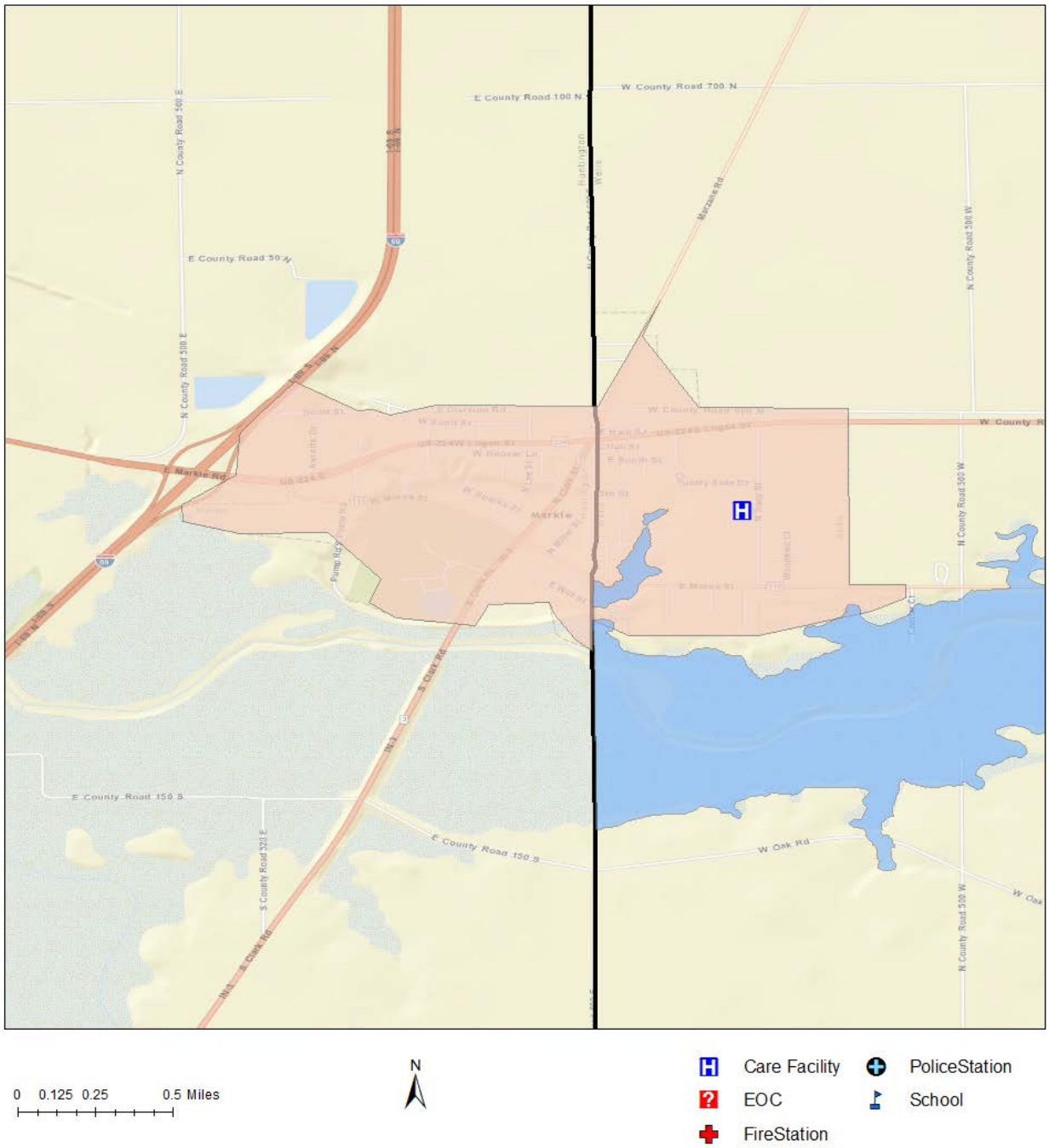
Wells County



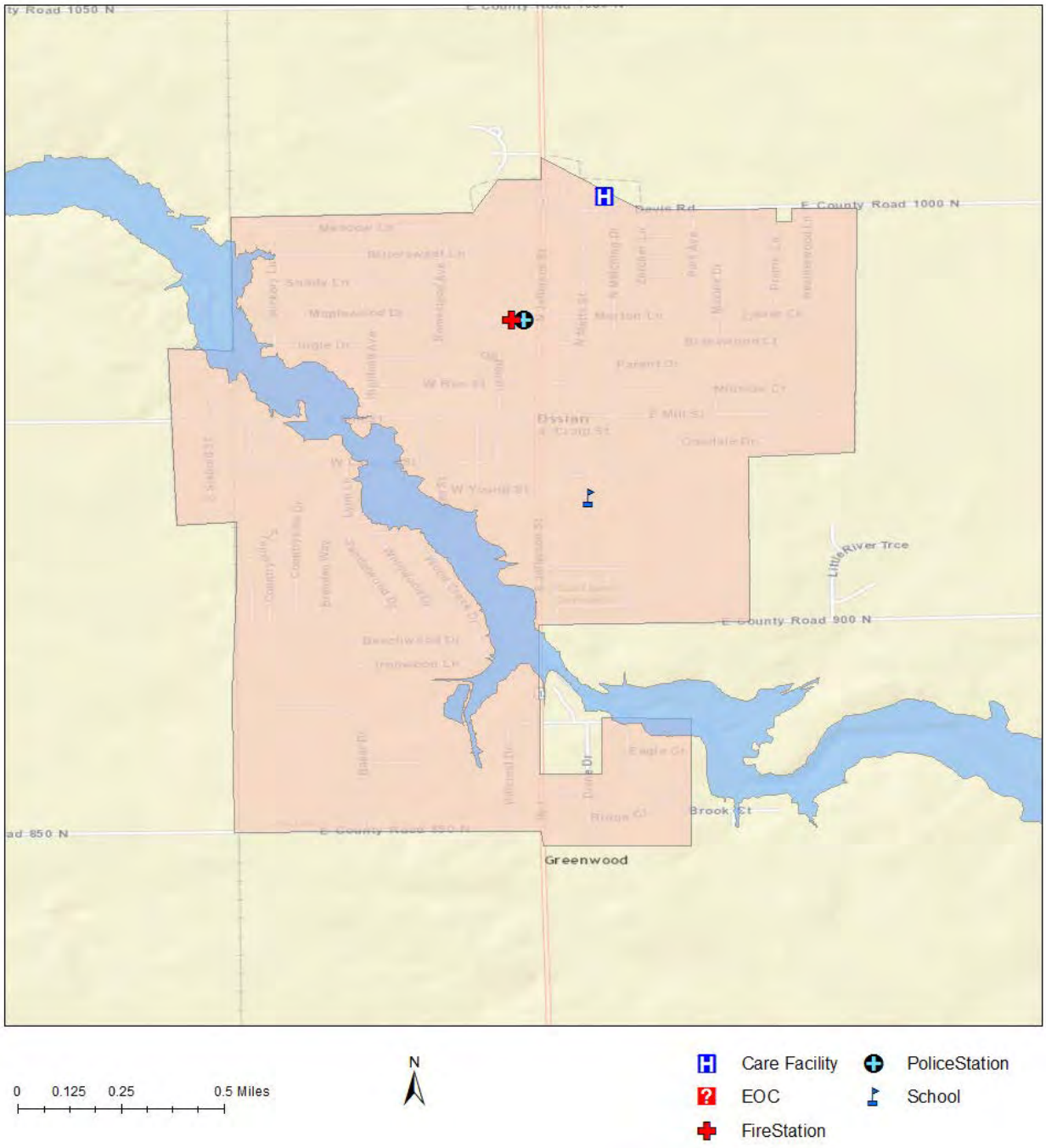
The City of Bluffton



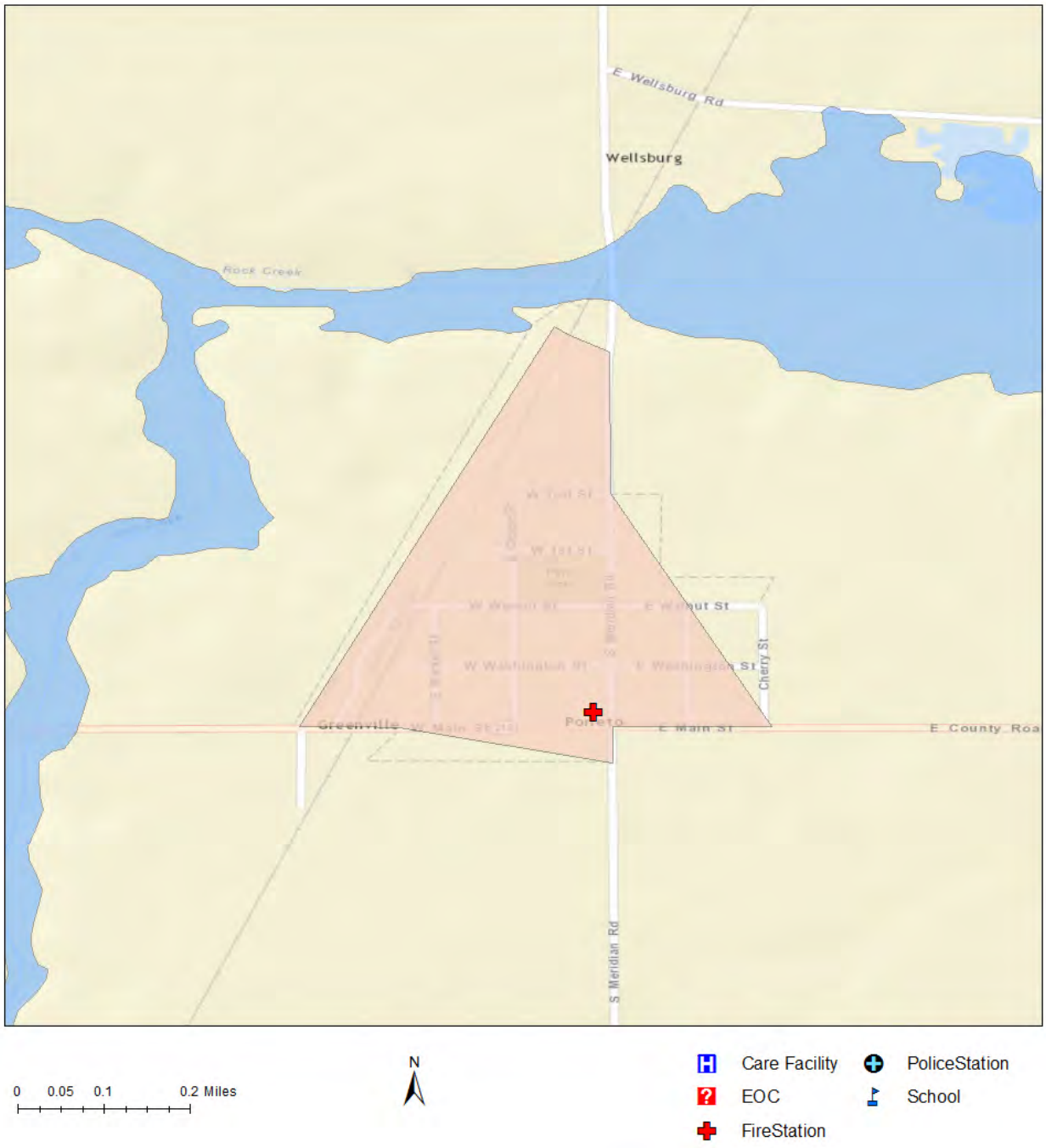
The Town of Markle



The Town of Ossian

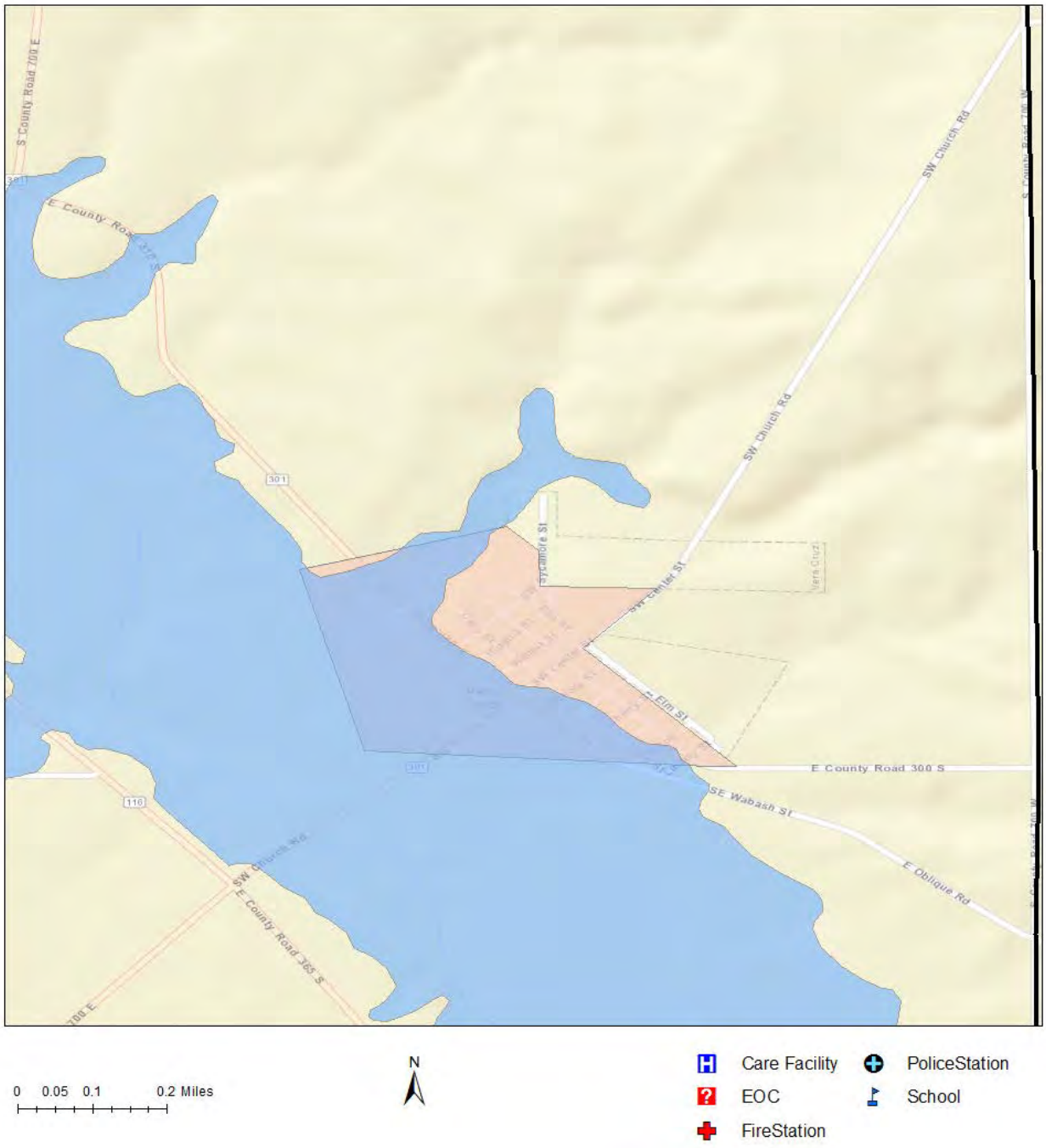


The Town of Poneto

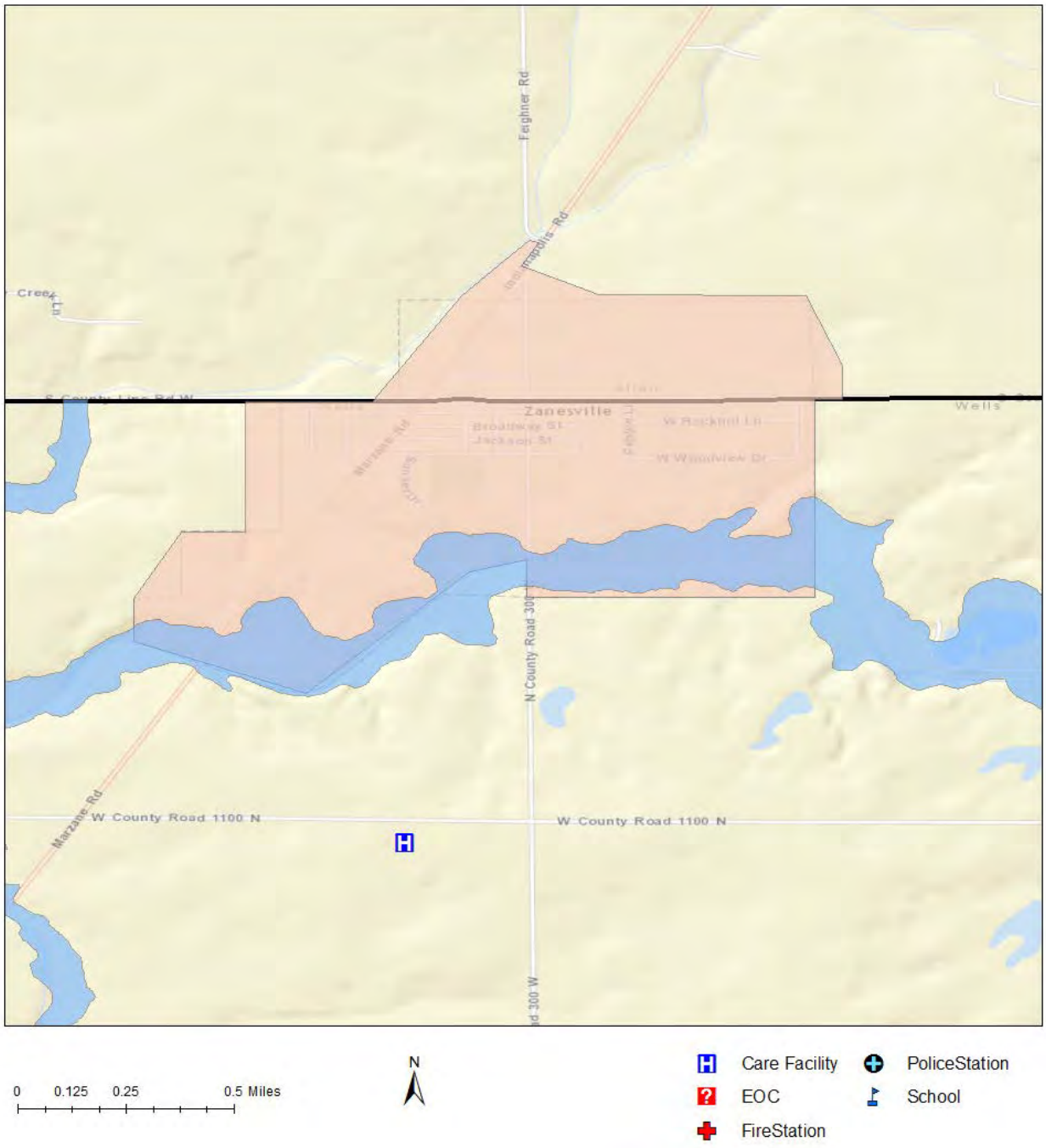


The Town of Uniondale

The Town of Vera Cruz



The Town of Zanesville



Appendix D

Calculated Priority Risk Index (CPRI)

Section 5.1.3 illustrates the county's hazard ranking based on a visual, graphed methodology. The Indiana Department of Homeland Security also requested that the county translate this prioritization into a Calculated Priority Risk Index (CPRI) for consistency with other counties in the state. The CPRI is calculated through four categories: (1) probability, (2) magnitude/severity, (3) warning time, and (4) duration. Table 1 lists the criteria for determining a hazard's probability, and Table 2 lists the criteria for classifying magnitude/severity.

Table 1: Future Occurrence Ranking

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

Table 2: Hazard Magnitude

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

Warning time and duration are allotted four ranges each, as shown in Table 3. Also indicated is the weighting factor for each of the four components of the CPRI. These weights of significance are used to assign relative importance to each of the factors when combined to generate the CPRI value. Table 4 identifies the CPRI values for each hazard facing Wells County.

Table 3: CPRI Categories and Weighting

.45 Probability	.30 Magnitude/Severity	.15 Warning Time	.10 Duration
4 - Highly Likely	4 - Catastrophic	4 - Less Than 6 Hours	4 - More Than 1 Week
3 - Likely	3 - Critical	3 - 6-12 Hours	3 - Less Than 1 Week
2 - Possible	2 - Limited	2 - 12-24 Hours	2 - Less Than 1 Day
1 - Unlikely	1 - Negligible	1 - 24+ Hours	1 - Less Than 6 Hours

CPRI VALUE = [(PROBABILITY X .45) + (MAGNITUDE X .30) + (WARNING TIME X .15) + (DURATION X .10)]

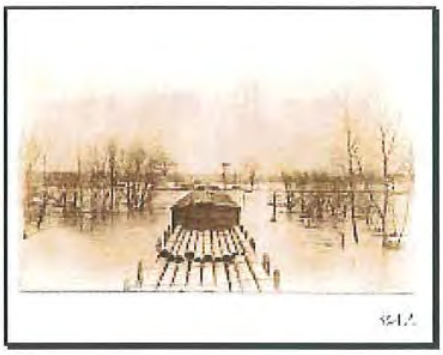
Table 4: Wells County CPRI and Hazard Ranking

Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Flash Flooding	4 - Highly Likely	4 - Catastrophic	3 - 6-12 Hours	3 - Less Than 1 Week	3.75
Riverine Flooding	4 - Highly Likely	4 - Catastrophic	3 - 6-12 Hours	3 - Less Than 1 Week	3.75
Severe Thunderstorm	4 - Highly Likely	2 - Limited	4 - Less Than 6 Hours	1 - Less Than 6 Hours	3.4
Winter Storms	4 - Highly Likely	3 - Critical	3 - 6-12 Hours	3 - Less Than 1 Week	3.15
Extreme Temperatures	3 - Likely	3 - Critical	1 - 24+ Hours	4 - More Than 1 Week	3.1
Tornado	3 - Likely	3 - Critical	4 - Less Than 6 Hours	1 - Less Than 6 Hours	2.95
Explosion/Fire	3 - Likely	2 - Limited	4 - Less Than 6 Hours	1 - Less Than 6 Hours	2.65
Drought	2 - Possible	2 - Limited	1 - 24+ Hours	4 - More Than 1 Week	2.05
Earthquake	1 - Unlikely	2 - Limited	4 - Less Than 6 Hours	2 - Less Than 1 Day	1.85
Hazardous Materials Release	2 - Possible	1 - Negligible	4 - Less Than 6 Hours	2 - Less Than 1 Day	1.55
Dam/Levee Failure	1 - Unlikely	1 - Negligible	4 - Less Than 6 Hours	1 - Less Than 6 Hours	1.45

Appendix E

Historical Disasters Photographs

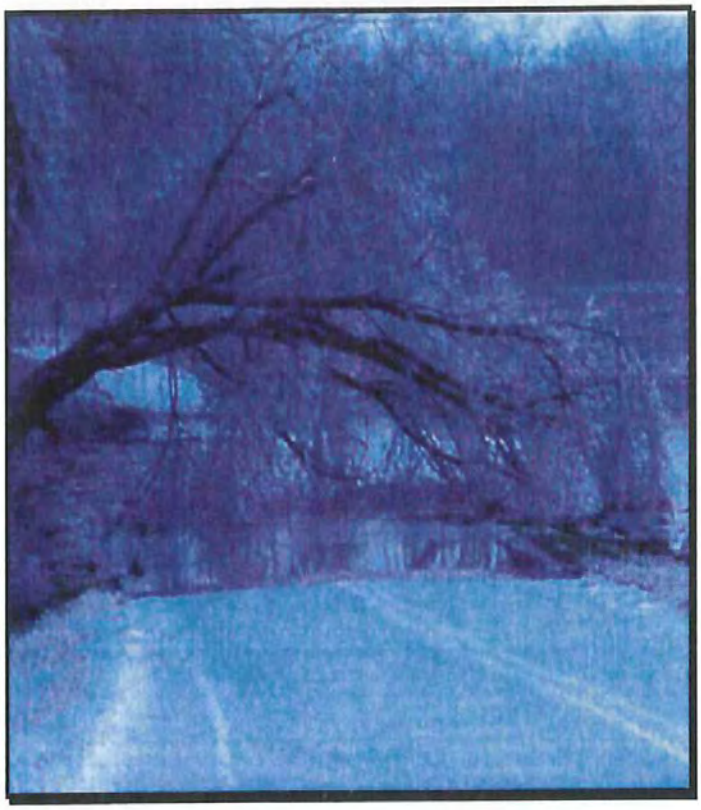
Bluffton Flood of 1913



Bluffton Flood of 1910

Blizzard of '78

Ice Storm (and Flood) of 2005



High Waters, March 8, 2009

Source: Wells County Voice

Flooding, January 2013

Source: Wells County Voice

Storm Damage, June 2012

Source: Wells County Voice

Appendix F

Mitigation Photographs and Projects

Diana Collins

From: Michael Jr. Lautzenheiser <gis@wellscounty.org>
Sent: Tuesday, March 03, 2015 3:19 PM
To: 'Diana Collins'; 'Rodney Renkenberger, PLS, CFM'
Subject: Stoney Creek Mobile Home Park Zanesville

I have applied to get an E-FARA for the Stoney Creek Mobile Home Park in Zanesville, Indiana to get the official BFE to provide a starting point to look at options. We should have some idea of the feasibility of the project prior to contacting the land owner. I would like to pursue this item to see how far it will go.

There are 25 manufactured homes at the location that were affected by the last flooding incident on April 19,2013.

Preliminary BFE (INFIP) 788.8 Upstream 786.7 Downstream

Sincerely,

Michael W. Lautzenheiser Jr., AICP
Wells County, IN
APC Director / GIS Manager
EMAIL: GIS@wellscounty.org
PH: (260) 824-6407
FAX: (260) 824-6415

Address:
Wells County Area Plan Commission
223 W Washington St
Bluffton, IN 46714

Web:
PUBLIC GIS PORTAL: www.wellscountygis.org
GIS OFFICE: www.wellscounty.org/gis.htm
APC OFFICE: www.wellscounty.org/apc.htm

Appendix G
Adopting Resolutions

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
County Commissioner Chairman

_____
County Commissioner

_____
County Commissioner

_____
County Commissioner

_____
Attested by: County Clerk

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Markle recognizes the threat that natural hazards pose to people and property; and

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Ossian recognizes the threat that natural hazards pose to people and property; and

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Poneto recognizes the threat that natural hazards pose to people and property; and

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Uniondale recognizes the threat that natural hazards pose to people and property; and

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Vera Cruz recognizes the threat that natural hazards pose to people and property; and

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

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

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

NOW, THEREFORE, BE IT RESOLVED, that the Town of Vera Cruz hereby adopts the Wells County Multi-Hazard Mitigation Plan as an official plan; and

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk

Resolution #_____

ADOPTING THE WELLS COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Town of Zanesville recognizes the threat that natural hazards pose to people and property; and

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

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

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

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

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

ADOPTED THIS _____ Day of _____, 2015.

_____
Town President

_____
Town Council Member

_____
Town Council Member

_____
Town Council Member

_____
Attested by: Town Clerk